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# SMITHSONIAN METEOROLOGICAL TABLES

[BASED ON GUYOT'S METEOROLOGICAL AND PHYSICAL TABLES]

*FOURTH REVISED EDITION*

(Corrected to January, 1918)

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# ADVERTISEMENT TO FOURTH REVISED EDITION.

THE original edition of the Smithsonian Meteorological Tables was issued in 1893, and revised editions were published in 1896, 1897, and 1907. A fourth revised edition is here presented, which has been prepared under the direction of Professor Charles F. Marvin, Chief of the U.S. Weather Bureau, assisted by Professor Herbert H. Kimball. They have had at their disposal numerous notes left by the late Professor Cleveland Abbe, and have consulted with officials of the U.S. Bureau of Standards and of other Government bureaus relative to the value of certain physical constants that have entered into the calculation of the tables.

All errata thus far detected in the earlier editions have here been corrected. New vapor pressure tables, derived from the latest experimental values by means of a modification of Van der Waals interpolation formula devised by Professor Marvin, have been introduced. The table of relative acceleration of gravity at different latitudes has been recomputed from a new equation based upon the latest investigations of the U.S. Coast and Geodetic Survey. These values have been employed in reducing barometric readings to the standard value of gravity adopted by the International Bureau of Weights and Measures, supplementing a table that has been introduced for directly reducing barometer readings from the value of gravity at the place of observation to its standard value.

The new values of vapor pressure and of gravity acceleration thus obtained, together with a recent and more accurate determination of the density of mercury, have called for an extensive revision of numerous other tables, and especially of those for the reduction of psychrometric observations, and the barometrical tables.

Among the new tables added are those for converting barometric inches and barometric millimeters into millibars, for determining heights from pressures expressed in dynamic units, tables of gradient winds, and tables giving the duration of astronomical and civil twilight, and the transmission percentages of radiation through moist air.

The tables of International Meteorological Symbols, of Cloud Classification, of the Beaufort Scale of Winds, of the Beaufort Weather Notation, and the List of Meteorological Stations, are among those extensively revised.

Tables for reducing barometric readings to sea level, and tables of logarithms of numbers, of natural sines and cosines, of tangents and cotangents, and for dividing by 28, 29, and 31, with a few others, have been omitted from this edition.

This reprint is from the electroplates that were employed in printing the Fourth Revised Edition, after making certain minor corrections.

CHARLES D. WALCOTT,
*Secretary.*

SMITHSONIAN INSTITUTION,
*June, 1924.*

## ADVERTISEMENT TO THIRD REVISED EDITION

The original edition of Smithsonian Meteorological Tables was issued in 1893, and revised editions were published in 1896 and 1897. A third revised edition is here presented, which has been prepared at the request of the late Professor Langley by the coöperation of Professors Alexander McAdie, Charles F. Marvin, and Cleveland Abbe.

All errata thus far detected have been corrected upon the plates, the Marvin vapor tensions over ice have been introduced, Professor F. H. Bigelow's System of Notation and Formulæ has been added, the List of Meteorological Stations has been revised, and the International Meteorological Symbols, together with the Beaufort Notation, are given at the close of the volume.

R. RATHBUN,
*Acting Secretary.*

SMITHSONIAN INSTITUTION,
December, 1906.

## ADVERTISEMENT TO SECOND REVISED EDITION.

The edition of the Smithsonian Meteorological Tables issued in 1893 having become exhausted, a careful examination of the work has been made, at my request, by Mr. Alexander McAdie, of the United States Weather Bureau, and a revised edition was published in 1896, with corrections upon the plates and a few slight changes. The International Meteorological Symbols and an Index were also added.

The demand for the work has been so great that it becomes necessary to print a new edition of the revised work, which is here presented with corrections to date.

S. P. LANGLEY,
*Secretary.*

SMITHSONIAN INSTITUTION,
WASHINGTON CITY,
October 30, 1897.

# PREFACE TO EDITION OF 1893.

In connection with the system of meteorological observations established by the Smithsonian Institution about 1850, a collection of meteorological tables was compiled by Dr. ARNOLD GUYOT, at the request of Secretary HENRY, and published in 1852 as a volume of the *Miscellaneous Collections*.

Five years later, in 1857, a second edition was published after careful revision by the author, and the various series of tables were so enlarged as to extend the work from 212 to over 600 pages.

In 1859 a third edition was published, with further amendments.

Although designed primarily for the meteorological observers reporting to the Smithsonian Institution, the tables obtained a much wider circulation, and were extensively used by meteorologists and physicists in Europe and in the United States.

After twenty-five years of valuable service, the work was again revised by the author; and the fourth edition, containing over 700 pages, was published in 1884. Before finishing the last few tables, Dr. GUYOT died, and the completion of the work was intrusted to his assistant, Prof. WM. LIBBEY, JR., who executed the duties of final editor.

In a few years the demand for the tables exhausted the edition, and thereupon it appeared desirable to recast entirely the work. After very careful consideration, I decided to publish the new tables in three parts: METEOROLOGICAL TABLES, GEOGRAPHICAL TABLES, and PHYSICAL TABLES, each representative of the latest knowledge in its field, and independent of the others; but the three forming a homogeneous series.

Although thus historically related to Dr. Guyot's Tables, the present work is so substantially changed with respect to material, arrangement, and presentation that it is not a fifth edition of the older tables, but essentially a new publication.

In its preparation the advantage of conformity with the recently issued *International Meteorological Tables* has been kept steadily in view, and so far as consistent with other decisions, the constants and methods there employed have been followed. The most important difference in constants is the relation of the yard to the metre. The value provisionally adopted by the Bureau of Weights and Measures of the United States Coast and Geodetic Survey,

$$1 \text{ metre} = 39.3700 \text{ inches},$$

has been used here in the conversion-tables of metric and English linear measures, and in the transformation of all formulæ involving such conversions.

A large number of tables have been newly computed; those taken from the *International Meteorological Tables* and other official sources are credited in the introduction.

To Prof. WM. LIBBEY, JR., especial acknowledgments are due for a large amount of attention given to the present work. Prof. LIBBEY had already completed a revision, involving considerable recomputation, of the meteorological tables contained in the last edition of Guyot's Tables, when it was determined to adopt new values for many of the constants, and to have the present volume set with new type. This involved a large amount of new computation, which was placed under the direction of Mr. GEORGE E. CURTIS, who has also written the text, and has carefully prepared the whole manuscript and carried it through the press. To Mr. Curtis's interest, and to his special experience as a meteorologist, the present volume is therefore largely due.

Prof. LIBBEY has contributed Tables 38, 39, 55, 56, 61, 74, 77, 89, and 90, and has also read the proof-sheets of the entire work.

I desire to express my acknowledgments to Prof. CLEVELAND ABBE, for the manuscript of Tables 32, 81, 82, 83, 84, 85, 86; to Mr. H. A. HAZEN, for Tables 49, 50, 94, 95, 96, which have been taken from his *Hand-book of Meteorological Tables;* and also to the Superintendent of the United States Coast and Geodetic Survey, the Chief Signal Officer of the Army, and the Chief of the Weather Bureau, for much valuable counsel during the progress of the work.

S. P. LANGLEY,
*Secretary.*

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# INTRODUCTION.

## DESCRIPTION AND USE OF TABLES.

### THERMOMETRY.

The present standard for exact thermometry is the normal centigrade scale of the constant-volume hydrogen thermometer as defined by the International Bureau of Weights and Measures. The constant volume is one liter and the pressure at the freezing point is one meter of mercury reduced to freezing and standard gravity. The scale is completely defined by designating the temperature of melting ice, $0^\circ$, and of condensing steam, $100^\circ$, both under standard atmospheric pressure. All other thermometric scales that depend upon the physical properties of substances may by definition be made to coincide at the ice point and the boiling point with the normal scale as above defined, but they will diverge more or less from it and from each other at all other points. However, by international consent it is customary in most cases to refer other working scales to the hydrogen scale.

*The absolute or thermodynamic scale.* To obviate the difficulty which arises because thermometers of different type and substance inherently disagree except at the fixed points, Lord Kelvin proposed that temperatures be defined by reference to certain thermodynamic laws. This course furnishes a scale independent of the nature or properties of any particular substance. The resulting scale has been variously named the absolute, the thermodynamic, and, more recently, in honor of its author, the Kelvin scale. The temperature of melting ice by this scale on the centigrade basis is not as yet accurately known, but it is very nearly $273^\circ.13$, and that of the boiling point, $373^\circ.13$.

Many problems in physics and meteorology call for the use of the absolute scale; but it is not convenient, and in many cases not necessary, to adhere strictly to the true thermodynamic scale. In fact, the general requirements of science will very largely be met by the use of an approximate absolute scale which for the centigrade system is defined by the equation

$$T = (273^\circ. + t^\circ \text{ C.})$$

The observed quantity, $t^\circ$, may be referred to the normal hydrogen centigrade scale or be determined by any acceptable thermometric method.

This scale differs from the true Kelvin scale, first, because $273^\circ$ is not the exact value of the ice point on the Kelvin scale, second, because each observed value of $t^\circ$ other than $0^\circ$ or $100^\circ$ requires a particular correction to convert it to the corresponding value on the Kelvin scale. These corrections will differ according to the kind of thermometer used in obtaining the value $t°$, and while they are small for temperatures between 0° and 100° they are large at extreme temperatures and are important in all questions involving thermometric precision.

Since, however, the approximate absolute scale is sufficiently exact for nearly all purposes, and especially since it is most convenient in computations and in the publication of results, much confusion and uncertainty of terminology and meaning will be obviated if scientists will agree to give the approximate absolute scale a particular name of its own.

For the purpose of these tables the name *Approximate Absolute* will be employed, and in accordance therewith thermometric scales may be designated as follows: —

| Scale. | Ice point. | Boiling point. | Symbol. |
|---|---|---|---|
| Centigrade | 0° | 100° | *C.* |
| Fahrenheit | 32 | 212 | *F.* or Fahr. |
| Reaumur | 0 | 80 | *R.* |
| Thermodynamic<br>Absolute<br>Kelvin | 273.13 *C.* ±<br>491.6 *F.* ±<br>(Names strictly synonymous and strictly one ideal scale.) | 373.13 *C.* ±<br>671.6 *F.* ± | *A.* or *K.* |
| Approximate Absolute | 273 | 373 | *A.A.* |

**Table 1.** *Conversion of the Approximate Absolute thermometric scale to the Centigrade, Fahrenheit, and Reaumur scales.*

The equivalent values of the four scales are given for every degree on the Approximate Absolute scale from 375° to 0°.

By the help of the table of proportional parts preceding this table, it is also convenient for converting Fahrenheit to Centigrade and Reaumur, and Centigrade to Fahrenheit and Reaumur.

The formulæ expressing the relations between the different scales are also given, in which

*A.A.*° = Temperature — Approximate Absolute Scale.
*C.*° = Temperature — Centigrade Scale.
*F.*° = Temperature — Fahrenheit Scale.
*R.*° = Temperature — Reaumur Scale.

**Examples:**

To convert 285°.5 Approximate Absolute into Centigrade, Fahrenheit, and Reaumur.

| | | | | |
|---|---|---|---|---|
| From the table, | 285° *A.A.* = | 12° *C.* = | 53°.6 *F.* = | 9°.6 *R.* |
| From the proportional parts, | 0.5 = | 0.5 = | 0.9 = | 0.4 |
| | 285.5 *A.A.* = | 12.5 *C.* = | 54.5 *F.* = | 10.0 *R.* |

To convert 16°.9 Centigrade to Approximate Absolute, Fahrenheit, and Reaumur.

| | | | | |
|---|---|---|---|---|
| From the table, | 16° C. | = 289° A.A. | = 60°.8 F. | = 12°.8 R. |
| From the proportional parts | 0.9 | = 0.9 | = 1.6 | = 0.7 |
| | 16.9 C. | = 289.9 A.A. | = 62.4 F. | = 13.5 R. |

Or,
$$16^\circ.9 \times 2\left(1 - \frac{1}{10}\right) + 32 = \begin{array}{r} 33.8 \\ -\ 3.4 \\ 32.0 \\ \hline 62.4\ F. \end{array}$$

To convert 147°.7 Fahrenheit to Approximate Absolute, Centigrade, and Reaumur.

| | | | | |
|---|---|---|---|---|
| From the table, | 140° F. | = 333° A.A. | = 60° C. | = 48° R. |
| From the proportional parts | 7.7 | = 4.3 | = 4.3 | = 3.4 |
| | 147.7 F. | = 337.3 A.A. | = 64.3 C. | = 51.4 R. |

Or,
$$\frac{147.7 - 32.0}{2}\left(1 + \frac{1}{10} + \frac{1}{100} + \frac{1}{1000}\ \text{etc.}\right) = \begin{array}{r} 57.85 \\ +\ 5.78 \\ +\ .58 \\ +\ .06 \\ \hline 64.27\ C. \end{array}$$

Fahrenheit may also be reduced to Approximate Absolute by obtaining its equivalent in Centigrade from Table 2 and adding 273 to the result.

To convert 18°.3 Reaumur to Approximate Absolute, Centigrade, and Fahrenheit.

| | | | | |
|---|---|---|---|---|
| From the table, | 16° R. | = 293° A.A. | = 20° C. | = 68° F. |
| From the proportional parts, | 2.3 | = 2.9 | = 2.9 | = 5.2 |
| | 18.3 R. | = 295.9 A.A. | = 22.9 C. | = 73.2 F. |

Or, $18.3 \times \frac{5}{4} = \frac{91.5}{4} = 22.9$ *C.*, and $(18.3 \times \frac{9}{4}) + 32 = \frac{164.7}{4} + 32 = 73.2$ *F.*

TABLE 2.

**Table 2.** *Conversion of readings of the Fahrenheit thermometer to readings Centigrade.*

The conversion of Fahrenheit temperatures to Centigrade temperatures is given for every tenth of a degree from + 130°.9 *F.* to − 120°.9 *F.* The side argument is the whole number of degrees Fahrenheit, and the top argument, tenths of a degree Fahrenheit; interpolation to hundredths of a degree, when desired, is readily effected mentally. The tabular values are given to hundredths of a degree Centigrade.

The formula for conversion is

$$C^\circ = \frac{5}{9}(F^\circ - 32^\circ)$$

where $F^\circ$ is a given temperature Fahrenheit, and $C^\circ$ the corresponding temperature Centigrade.

**Example:**

To convert 79°.7 Fahrenheit to Centigrade.
The table gives directly 26°.50 *C.*

For conversions of temperatures outside the limits of the table use Table 1.

**Table 3.** *Conversion of readings of the Centigrade thermometer to readings Fahrenheit.*

The conversion of Centigrade temperatures to Fahrenheit temperatures is given for every tenth of a degree Centigrade from + 60°.9 to − 90°.9 *C.* The tabular values are expressed in hundredths of a degree Fahrenheit.

The formula for conversion is

$$F^\circ = \frac{9}{5}C^\circ + 32^\circ$$

where $C^\circ$ is a given temperature Centigrade, and $F^\circ$ the corresponding temperature Fahrenheit.

For conversions of temperatures outside the limits of the table, use Table 1 or 4.

**Table 4.** *Conversion of readings of the Centigrade thermometer near the boiling point to readings Fahrenheit.*

This is an extension of Table 3 from 90°.0 to 100°.9 Centigrade.

**Example:**

To convert 95°.74 Centigrade to Fahrenheit.

| | | | |
|---|---|---|---|
| From the table, | 95°.70 *C.* | = | 204°.26 *F.* |
| By interpolation, | 0.04 | = | 0.07 |
| | 95°.74 *C.* | = | 204°.33 *F.* |

**Table 5.** *Conversion of differences Fahrenheit to differences Centigrade.*

The table gives for every tenth of a degree from 0° to 20°.9 *F.* the corresponding lengths of the Centigrade scale.

**TABLE 6.** *Conversion of differences Centigrade to differences Fahrenheit.*

The table gives for every tenth of a degree from 0° to 9°.9 *C.* the corresponding lengths of the Fahrenheit scale.

Example:

To find the equivalent difference in Fahrenheit degrees for a difference of 4°.72 Centigrade.

| | | | |
|---|---|---|---|
| From the table, | 4°.70 *C.* | = | 8°.46 *F.* |
| From the table by moving the decimal point for 0.2, | 0.02 | = | 0.04 |
| | 4°.72 *C.* | = | 8°.50 *F.* |



**TABLES 7, 8.** *Correction for the temperature of the emergent mercurial column of thermometers.*

When the temperature of the thermometer stem containing a portion of the mercury column is materially different from that of the bulb, a correction needs to be applied to the observed reading unless the instrument has been previously graduated for the condition of use. This correction frequently becomes necessary in physical experiments where the bulb only, or else the bulb with a portion of the stem, is immersed in a bath whose temperature is to be determined. In meteorological observations the correction may become appreciable in wet-bulb, dew-point, and solar-radiation thermometers, when the temperature of the bulb is considerably above or below the air temperature.

If $t'$ be the average temperature of the emergent mercury column, $t$ the observed reading of the thermometer, $n$ the length of the mercury in the emergent stem in scale degrees, and $\alpha$ the apparent expansion of mercury in glass for 1°, the correction is given by the expression

$$\alpha n\,(t - t'),\ \text{or}\ -\alpha n\,(t' - t)$$

which latter may be the more convenient form when $t'$ is greater than $t$.

The value of $\alpha$ varies with the composition of the glass of which the thermometer stem is composed. For glass of unknown composition the best average value for centigrade temperatures appears to be 0.000155, while for stems of Jena $16^{III}$, or similar glasses, or Jena $59^{III}$, the values 0.00016 for the former and 0.000165 for the latter may be preferred. (Letter from U.S. Bureau of Standards dated January 5, 1918.)

The use of the formula given above presupposes that the mean temperature of the emergent column has been determined. This temperature may be approximately obtained in one of three ways. (1) By a "fadenthermometer" (Buckingham, Bulletin, Bureau of Standards, 8, 239, 1911, Scientific Paper 170); (2) by exploring the temperature distribution along the stem and calculating the mean temperature; (3) by suspending along the side of, or attaching to the stem, a single thermometer. If properly placed this thermometer will indicate the temperature of the emergent mercurial column to an accuracy sufficient for many purposes. Under conditions ordinarily met with in practice it is desirable to place the bulb of the auxiliary thermometer at some point below the middle of the emergent column.

It is to be noted that the correction sought is directly proportional to the value of $\alpha$, and that this may vary for glass stems of different composition from 0.00015 to 0.000165 for Centigrade temperatures. For thermometers ordinarily used in meteorological work, however, 0.000155 appears to be a good average value for Centigrade temperatures (0.000086 for Fahrenheit temperatures), and the correction formulæ, therefore, are,

$$T = t - 0.000086\, n\, (t' - t) \text{ Fahrenheit temperatures.}$$
$$T = t - 0.000155\, n\, (t' - t) \text{ Centigrade temperatures.}$$

In the above, $T$ = Corrected temperature.
$t$ = Observed temperature.
$t'$ = Mean temperature of the glass stem and emergent mercury column.
$n$ = Length of mercury in the emergent stem in scale degrees.

When $t'$ is $\left\{\begin{matrix}\text{higher}\\ \text{lower}\end{matrix}\right\}$ than $t$ the numerical correction is to be $\left\{\begin{matrix}\text{subtracted.}\\ \text{added.}\end{matrix}\right\}$

**Table 7** gives corrections computed to $0^\circ.01$ for Fahrenheit thermometers from the equation $C = -0.000086\, n\, (t' - t)$. The side argument, $n$, is given for $10^\circ$ intervals from $10^\circ$ to $130^\circ$; the top argument, $t' - t$, for $10^\circ$ intervals from $10^\circ$ to $100^\circ$.

**Table 8** gives corrections computed to $0^\circ.01$ for Centigrade thermometers from the equation $C = -0.000155\, n\, (t' - t)$. The side argument, $n$, is given for $10^\circ$ intervals from $10^\circ$ to $100^\circ$; the top argument, $t' - t$, for $10^\circ$ intervals from $10^\circ$ to $80^\circ$.

**Example:**

The observed temperature of a black-bulb thermometer is $120^\circ.4$ *F.*, the temperature of the glass stem is $55^\circ.2$ *F.*, and the length of mercury in the emergent stem is $130^\circ$ *F.* To find the corrected temperature. With $n = 130^\circ$ *F.* and $t' - t = -65^\circ$ *F.*, as arguments, Table 7 gives the correction $0^\circ.7$ *F.*, which by the above rule is to be added to the observed temperature. The corrected temperature is therefore $121^\circ.1$ *F.*

## CONVERSIONS INVOLVING LINEAR MEASURES.

The fundamental unit of length is the meter, the length of which is equal to the distance between the defining lines on the international prototype meter at the International Bureau of Weights and Measures (near Paris) when this standard is at the temperature of melting ice ($0^\circ$ *C*). The relation here adopted between the meter and the yard, the English measure of length, is 1 meter = 39.3700 inches, as legalized by Act of U.S. Congress, July 28, 1866. This U.S. Standard of length must be distinguished from the British Imperial yard, comparisons of which with the international prototype meter give the relation 1 meter = 39.370113 inches. (See Smithsonian Physical Tables, 1916, p. 7, Table 3.)

**Table 9.** *Inches into millimeters.* **TABLE 9.**

1 inch = 25.40005 millimeters.

The argument is given for every hundredth of an inch up to 32.00 inches, and the tabular values are given to hundredths of a millimeter. A table of proportional parts for thousandths of an inch is added on each page.

**Example:**

To convert 24.362 inches to millimeters.
The table gives (p. 20).

(24.36 + .002) inches = (618.75 + 0.05) mm. = 618.80 mm.

**Table 10.** *Millimeters into inches.* **TABLE 10.**

From 0 to 400 mm. the argument is given to every millimeter, with subsidiary interpolation tables for tenths and hundredths of a millimeter. The tabular values are given to four decimals. From 400 to 1000 mm., covering the numerical values which are of frequent use in meteorology for the conversion of barometric readings from the metric to the English barometer, the argument is given for every tenth of a millimeter, and the tabular values to three decimals.

**Example:**

To convert 143.34 mm. to inches.
The table gives

(143 + .3 + .04) mm. = (5.6299 + 0.0118 + 0.0016) inches = 5.6433 inches.

**Tables 11, 12.** *Conversion of barometric readings into standard units of pressure.* **TABLES 11, 12.**

The equation for the pressure in millibars,[1] $P_{mb}$, corresponding to the barometric height, $B$, is

$$P_{mb} = B\,\frac{\Delta\,g}{1000}$$

where $\Delta$ is the density of mercury and $g$ is the standard value of gravity.

[1] The value of the *bar* as here defined is a pressure of 1,000,000 dynes per square centimeter, and is that employed by meteorological services, and recommended by inter-

In order that pressures thus derived shall be expressed in C.G.S. units it is evident that the recognized standard values of the constants of the equation must be employed. It therefore becomes necessary to abandon the values for the density of mercury and for standard gravity heretofore employed, which had the sanction of the International Meteorological Committee, in favor of the more recently determined values that have been adopted by the International Bureau of Weights and Measures.

The value adopted for $\Delta$ is 13.5951 grams per cubic centimeter;[1] and for $g$, 980.665 dynes.[2]

By the use of these constants in the above equation we obtain

$$P_{mb} = 1.333224\ B \text{ (millimeters), and}$$

$$P_{mb} = \frac{1.333224}{0.03937}\ B = 33.86395\ B \text{ (inches)}$$

where $B$ is the height of the barometer in the units indicated, after reduction to standard temperature and the standard value of gravity.

**Table 11.** *Barometric inches to millibars.*

The argument is for 0.01 inch. From 0.00 to 2.49 inches the tabulated values are given to the nearest hundredth of a millibar, so that by removing the decimal one place to the right the value in millibars of every tenth inch from 0.0 to 24.9 inches may be obtained to the nearest tenth of a millibar. From 25.00 to 31.99 inches the tabular values are given to the nearest tenth of a millibar.

The first part of the table may be used as a table of proportional parts for interpolation.

**Example:**

To convert 23.86 barometric inches into millibars of pressure.

| | | | |
|---|---|---|---|
| From Table 11, | 23.8 inches | = | 806.0 millibars |
| " " " | .06 inch | = | 2.0 " |
| | 23.86 inches | = | 808.0 millibars |

**Table 12.** *Barometric millimeters to millibars.*

The argument is for each millimeter from 1 to 799, and the tabular values are given to the nearest tenth of a millibar.

This table may also be used to convert millibars into millimeters of mercury.

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national meteorological and aerological conferences. It is 1,000,000 times greater than that given in the Smithsonian Physical Tables, 6th ed., 1914, p. 346. The smaller value is generally employed by physicists and chemists. See Marvin, Charles F. Nomenclature of the Unit of Absolute Pressure. Monthly Weather Review, 1918, 46:73–75.

[1] Chappuis, Recueil de Constantes Physiques, Soc. Fr. Phys., 1913, p. 139. Leduc, Trav. et Mém., Bur. Int. Poids et Mes., XVI, p. 36, 1917.

[2] Comptes Rendus des Séances, Troisième Conférence Générale, p. 68. Trav. et Mém., Bur. Int. Poids et Mes., XII, 1902.

Example :

To convert 1003.5 millibars into millimeters of mercury. 1003.5 mb. = (1002.6 + 0.9) mb. = (752 + 0.68) mm. = 752.68 mm.

**TABLE 13.** *Feet into meters.* **TABLE 13.**

From the adopted value of the meter, 39.3700 inches —

1 English foot = 0.3048006 meter.

Table 13 gives the value in meters and thousandths (or millimeters) for every foot from 0 to 99 feet; the value to hundredths of a meter (or centimeters) of every 10 feet from 100 to 4090 feet; and the value to tenths of a meter of every 10 feet from 4000 to 9090 feet. In using the latter part, the first line of the table serves to interpolate for single feet.

Example:

| | | | | |
|---|---|---|---|---|
| To convert 47 feet 7 inches to meters. | 47 feet 7 inches | = | 47.583 | feet. |
| The table gives | 47 feet | = | 14.326 | meters. |
| By moving the decimal point | 0.583 " | = | 0.178 | " |
| | 47.583 feet | = | 14.504 | meters. |

**TABLE 14.** *Meters into feet.* **TABLE 14.**

1 meter = 39.3700 inches = 3.280833 + feet.

From 0 to 509 meters the argument is given for every unit, and the tabular values to two decimals; from 500 to 5090 the argument is given to every 10 meters, and the tabular values to one decimal. The conversion for tenths of a meter is added for convenience of interpolation.

Example :

Convert 4327 meters to feet.

The table gives

(4320 + 7) meters = (14173.2 + 23.0) feet = 14196.2 feet.

**TABLE 15.** *Miles into kilometers.* **TABLE 15.**

1 mile = 1.609347 kilometers.

The table extends from 0 to 1009 miles with argument to single miles, and from 1000 to 20000 miles for every 1000 miles. The tabular quantities are given to the nearest kilometer.

**TABLE 16.** *Kilometers into miles.* **TABLE 16.**

1 kilometer = 0.621370 mile.

The table extends to 1009 kilometers with argument to single kilometers, and from 1000 to 20000 kilometers for every 1000 kilometers. Tabular values are given to tenths of a mile.

Example :

Convert 3957 kilometers into miles.

The table gives

(3000 + 957) kilometers = (1864.1 + 594.7) miles = 2458.8 miles.

**Table 17.** *Interconversion of nautical and statute miles.*

The nautical mile as defined by the U.S. Coast and Geodetic Survey (Tables for a polyconic projection of maps. U.S. Coast and Geodetic Survey, Special Publication No. 5, page 4) is "A minute of arc of a great circle of a sphere whose surface equals that of the Clarke representative spheroid of 1866," and the value given is 1853.25 meters, or 6080.20 feet.

**Table 18.** *Continental measures of length with their metric and English equivalents.*

This table gives a miscellaneous list of continental measures of length, alphabetically arranged, with the name of the country to which they belong and their metric and English equivalents.

## CONVERSION OF MEASURES OF TIME AND ANGLE.

**Table 19.** *Arc into time.*

$$1^\circ = 4^m;\ 1' = 4^s;\ 1'' = \frac{1}{15}^s = 0\overset{s}{.}067.$$

**Example:**

Change 124° 15′ 24″.7 into time.

From the table,

| | | | | |
|---|---|---|---|---|
| 124° | = | $8^h$ | $16^m$ | $0^s$ |
| 15′ | = | | 1 | 0 |
| 24″ | = | | | 1.600 |
| 0″.7 | = | | | .047 |
| | | $8^h$ | $17^m$ | $1\overset{s}{.}647$ |

**Table 20.** *Time into arc.*

$$1^h = 15^\circ;\ 1^m = 15';\ 1^s = 15''.$$

**Example:**

Change $8^h\ 17^m\ 1\overset{s}{.}647$ into arc.

| | | | | | |
|---|---|---|---|---|---|
| From the table, | $8^h$ | = | 120° | | |
| | $17^m$ | = | 4 | 15′ | |
| | $1^s$ | = | | | 15″ |
| | 0.64 | = | | | 9.60 |
| By moving the decimal point, | .007 | = | | | 0.10 |
| | | | 124° | 15′ | 24″.7 |

**Table 21.** *Days into decimals of a year and angle.*

The table gives for the beginning of each day the corresponding decimal of the year to five places. Thus, at the epoch represented by the beginning of the 15th day, the decimal of the year that has elapsed since January 1.0 is computed from the fraction $\frac{14}{365.25}$. The corresponding value in angle obtained by multiplying this fraction by 360°, is given to the nearest minute.

Two additional columns serve to enter the table with the day of the month either of the common or the bissextile year as the argument, and may be used also for converting the day of the month to the day of the year, and *vice versa*.

Example:

To find the number of days and the decimal of a year between February 12 and August 27 in a bissextile year.

| | | | |
|---|---|---|---|
| Aug. 27: Day of year | = 240; | decimal of a year | = 0.65435 |
| Feb. 12: " " " | = 43; | " " " | = 0.11499 |
| Interval in days | = 197; | interval in decimal of a year | = 0.53936 |

The decimal of the year corresponding to the interval 197 days may also be taken from the table by entering with the argument 198.

**TABLE 22.** *Hours, minutes and seconds into decimals of a day.* **TABLE 22.**

The tabular values are given to six decimals.

Example:

Convert $5^h\ 24^m\ 23^s.4$ to the decimal of a day:

$$\begin{array}{rl} 5^h = & 0^d.208333 \\ 24^m = & 016667 \\ 23^s = & 266 \\ \text{By interpolation, or by moving the decimal for } 4^s \quad 0.4 = & \underline{\phantom{00000}5} \\ & 0^d.225271 \end{array}$$

**TABLE 23.** *Decimals of a day into hours, minutes and seconds.* **TABLE 23.**

Example:

Convert $0^d.225271$ to hours, minutes and seconds:

$$\begin{array}{lllll} 0.22 & \text{day} = 4^h\ 48^m & + 28^m\ 48^s & = & 5^h\ 16^m\ 48^s \\ 0.0052 & \text{day} = 7^m\ 12^s & + 17^s.28 & = & 7\ \ 29.28 \\ 0.000071 & \text{day} = 6^s.05 & + \ 0.09 & = & \underline{\phantom{0000}6.14} \\ & & & & 5^h\ 24^m\ 23^s.4 \end{array}$$

**TABLE 24.** *Minutes and seconds into decimals of an hour.* **TABLE 24**

The tabular values are given to six decimals.

Example:

Convert $34^m\ 28^s.7$ to decimals of an hour.

$$\begin{array}{rr} 34^m = & 0^h.566667 \\ 28^s = & 7778 \\ 0^s.7 = & \underline{194} \\ & 0.574639 \end{array}$$

**Table 25.** *Local mean time at apparent noon.*

This table gives the local mean time[1] that should be shown by a clock when the center of the sun crosses the meridian, on the 1st, 8th, 16th, and 24th days of each month. The table is useful in correcting a clock by means of a sundial or noon mark.

**Example:**

To find the correct local mean time when the sun crosses the meridian on December 15, 1891.

The table gives for December 16, $11^h\ 56^m$. By interpolating, it is seen that the change to December 15 would be only one-half minute; the correct clock time is therefore 4 minutes before 12 o'clock noon.

**Table 26.** *Sidereal time into mean solar time.*

**Table 27.** *Mean solar time into sidereal time.*

According to Newcomb, the length of the tropical year is 365.24220 mean solar days,[2] whence

$$365.24220 \text{ solar days} = 366.24220 \text{ sidereal days.}$$

Any interval of mean time may therefore be changed into sidereal time by increasing it by its $\frac{1}{365.24220}$ part, and any interval of sidereal time may be changed into mean time by diminishing it by its $\frac{1}{366.24220}$ part.

Table 26 gives the quantities to be subtracted from the hours, minutes and seconds of a sidereal interval to obtain the corresponding mean time interval, and Table 27 gives the quantities to be added to the hours, minutes and seconds of a mean time interval to obtain the corresponding sidereal interval. The correction for seconds is sensibly the same for either a sidereal or a mean time interval and is therefore given but once, thus forming a part of each table.

**Examples:**

Change $14^h\ 25^m\ 36^s.2$ sidereal time into mean solar time.

| | | | | |
|---|---|---|---|---|
| Given sidereal time | | $14^h$ | $25^m$ | $36^s.2$ |
| Correction for $14^h$ | $= -\ 2^m\ 17^s.61$ | | | |
| $25^m$ | $= -\ \ 4.10$ | | | |
| $36^s.2$ | $= -\ \ .10$ | | | |
| | $-2\ \ 21.81$ | | $-2$ | $21.8$ |
| Corresponding mean time | $=$ | 14 | 23 | 14.4 |

[1] Derived from the equation of time for Washington apparent noon for the year 1899. See the American Ephemeris and Nautical Almanac, 1899, pages 377–84.

[2] The length of the tropical year is not absolutely constant. The value here given is for the year 1900. Its decrease in 100 years is about 0.5s. (See the American Ephemeris and Nautical Almanac 1918, page xvi.)

2. Change $13^h\ 37^m\ 22^s.7$ mean solar time into sidereal time.

| | | | | | | |
|---|---|---|---|---|---|---|
| Given mean time | = | | | $13^h$ | $37^m$ | $22^s.7$ |
| Correction for $13^h$ | = | $+\ 2^m$ | $8^s.13$ | | | |
| $37^m$ | = | + | 6.08 | | | |
| $22^s.7$ | = | + | 0.06 | | | |
| | | + 2 | 14.27 | | + 2 | 14.3 |
| Corresponding sidereal time | = | | | 13 | 39 | 37.0 |

## CONVERSION OF MEASURES OF WEIGHT.

TABLE 28.

**Table 28.** *Conversion of avoirdupois pounds and ounces into kilograms.*

The comparisons of July, 1893, made by the International Bureau of Weights and Measures between the Imperial standard pound and the "kilogram prototype" resulted in the relation:

1 pound avoirdupois = 453.592 427 7 grams.

For the conversion of pounds, Table 28 gives the argument for every tenth of a pound up to 9.9, and the tabular conversion values to ten-thousandths of a kilogram.

For the conversion of ounces, the argument is given for every tenth of an ounce up to 15.9, and the tabular values to ten-thousandths of a kilogram.

TABLE 29.

**Table 29.** *Conversion of kilograms into avoirdupois pounds and ounces.*

From the above relation between the pound and the kilogram,

1 kilogram = 2.204622 avoirdupois pounds.
= 35.274 avoirdupois ounces.

The table gives the value to thousandths of a pound of every tenth of a kilogram up to 9.9; the values of tenths of a kilogram in ounces to four decimals; and the values of hundredths of a kilogram in pounds and ounces to three and two decimals respectively.

**Table 30.** *Conversion of grains into grams.* TABLES 30, 31.

**Table 31.** *Conversion of grams into grains.*

From the above relation between the pound and the kilogram,

1 gram = 15.432356 grains.
1 grain = 0.06479892 gram.

**Table 30** gives to ten-thousandths of a gram the value of every grain from 1 to 99, and also the conversion of tenths and hundredths of a grain for convenience in interpolating.

**Table 31** gives to hundredths of a grain the value of every tenth of a gram from 0.1 to 9.9, and the value of every gram from 1 to 99. The values of hundredths and thousandths of a gram are added as an aid to interpolation.

## WIND TABLES.

### CONVERSION OF VELOCITIES.

**Table 32.** *Synoptic conversion of velocities.*

This table,[1] contained on a single page, converts miles per hour into meters per second, feet per second and kilometers per hour. The argument, miles per hour, is given for every half unit from 0 to 78. Tabular values are given to one decimal. For the rapid interconversion of velocities, when extreme precision is not required, this table has proved of marked convenience and utility.

**Table 33.** *Conversion of miles per hour into feet per second.*

The argument is given for every unit up to 149 and the tabular values are given to one decimal.

**Table 34.** *Conversion of feet per second into miles per hour.*

The argument is given for every unit up to 199 and the tabular values are given to one decimal.

**Table 35.** *Conversion of meters per second into miles per hour.*

The argument is given for every tenth of a meter per second up to 60 meters per second, and the tabular values are given to one decimal.

**Table 36.** *Conversion of miles per hour into meters per second.*

The argument is given for every unit up to 149, and the tabular values are given to two decimals.

**Table 37.** *Conversion of meters per second into kilometers per hour.*

The argument is given for every tenth of a meter per second up to 60 meters per second, and the tabular values are given to one decimal.

**Table 38.** *Conversion of kilometers per hour into meters per second.*

The argument is given for every unit up to 200, and the tabular values are given to two decimals.

**Table 39.** *Scale of Velocity equivalents of the so-called Beaufort scale of wind.*

The personal observation of the estimated force of the wind on an arbitrary scale is a method that belongs to the simplest meteorological

[1] From *Hand-Book of Meteorological Tables.* By H. A. Hazen. Washington, 1888.

records and is widely practiced. Although anemometers are used at meteorological observatories, the majority of observers are still dependent upon estimates based largely upon their own judgment, and so reliable can such estimates be made that for many purposes they abundantly answer the needs of meteorology as well as of climatology.

A great variety of such arbitrary scales have been adopted by different observers, but the one that has come into the most general use and received the greatest definiteness of application is the duodecimal scale introduced into the British navy by Admiral Beaufort about 1800.

Table 39 is taken from the Observer's Handbook of the Meteorological Office, London, edition of 1917. The velocity equivalents in meters per second and miles per hour are based on extensive observational data collected by Dr. G. C. Simpson and first published by the Meteorological Office in 1906. Several other sets of equivalents have been published in different countries. For a history of this subject see Rept. 10th Meeting International Meteorological Committee, Rome, 1913, Appendix VII. (London, 1914.)

In the *Quarterly Journal of the Royal Meteorological Society*, volume xxx, No. 132, October, 1904, Prof. A. Lawrence Rotch has described an instrument for obtaining the true direction and velocity of the wind at sea aboard a moving vessel. If a line $A\ B$ represents the wind due to the motion of a steamer in an opposite direction, and $A\ C$ the direction of the wind relative to the vessel as shown by the drift of its smoke, then, by measuring the angle $D\ B\ A$ that the true wind makes with the vessel — which is easily done by watching the wave crests as they approach it — we obtain the third side, $B\ C$, of the triangle. This represents, in direction and also in length, on the scale used in setting off the speed of the ship, the true direction of the wind relative to the vessel and also its true velocity. The method fails when the wind direction coincides with the ship's course and becomes inaccurate when the angle between them is small.

## CALCULATION OF THE MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

Lambert's formula for the eight principal points of the compass is

$$\tan \alpha = \frac{E - W + (NE + SE - NW - SW)\cos 45^\circ}{N - S + (NE + NW - SE - SW)\cos 45^\circ}.$$

$\alpha$ is the angle of the resultant wind direction with the meridian.
$E$, $NE$, $N$, etc., represent the wind movement from the corresponding directions East, Northeast, North, etc. In practice, instead of taking the total wind movement, it is often considered sufficient to take as proportional thereto the number of times the wind has blown from each direction,

which is equivalent to considering the wind to have the same mean velocity for all directions.

If directions are observed to sixteen points, half the number belonging to each extra point should be added to the two octant points between which it lies; for example, *NNE* = 6 should be separated into *N* = 3 and *NE* = 3; *ESE* = 4, into *E* = 2 and *SE* = 2. The result will be approximately identical with that obtained by using the complete formula for sixteen points.

**Table 40.** *Multiples of cos* 45°; *form for computing the numerator and denominator.*

**Table 41.** *Values of the mean direction* ($\alpha$) *or its complement* ($90° - \alpha$).

Table 40 gives products of cos 45° by numbers up to 209, together with a form for the computation of the numerator and denominator, illustrated by an example. The quadrant in which $\alpha$ lies is determined by the following rule:

When the numerator and denominator are positive, $\alpha$ lies between *N* and *E*.

When the numerator is positive and the denominator negative, $\alpha$ lies between *S* and *E*.

When the numerator and denominator are negative, $\alpha$ lies between *S* and *W*.

When the numerator is negative and the denominator positive, $\alpha$ lies between *N* and *W*.

Table 41[1] combines the use of a division table and a table of natural tangents. It enables the computer, with the numerator and denominator of Lambert's formula (computed from Table 40) as arguments, to take out directly the mean wind direction $\alpha$ or its complement.

The top argument consists of every fifth number from 10 to 200.

The side argument is given for every unit from 1 to 50 and for every two units from 50 to 150. Tabular values are given to the nearest whole degree.

**Rule for using the table:**

Enter the table with the larger number (either numerator or denominator) as the top argument.

If the denominator be larger than the numerator, the table gives $\alpha$.

If the denominator be smaller than the numerator, the table gives $90° - \alpha$.

$\alpha$ is measured from the meridian in the quadrant determined by the rule given with Table 40.

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[1] From *Hand-book of Meteorological Tables*. By H. A. Hazen. Washington, 1888. A corrected copy of the table was kindly furnished by the author.

**Example:**

$$\tan \alpha = \frac{-43}{-27}.$$

Table 41 gives $\quad 90^\circ - \alpha = 32^\circ$

$$\alpha = S\ 58^\circ\ W.$$

NOTE. — If the numerator and denominator both exceed 150 or if either exceeds 200, the fraction must be divided by some number which will bring them within the limits of the table. The larger the values, provided they are within these limits, the easier and more accurate will be the computation. For example, let $\tan \alpha = \frac{-18}{14}$. The top argument is not given for 18, but if we multiply by 5 or 10 and obtain $\frac{-90}{70}$ or $\frac{-180}{140}$, the table gives, without interpolation, $90^\circ - \alpha = 38^\circ$ and $\alpha = N\ 52^\circ\ W$.

## GRADIENT WINDS.

When the motions of the atmosphere attain a state of complete equilibrium of flow under definite systems of pressure gradients, the winds blow across the isobars at small angles of inclination depending upon the retarding effects of friction. At the surface of the earth friction is considerable and the angle across the isobars is often great. In the free air, however, the friction is small, and for some purposes may be disregarded entirely. Under an assumption of complete equilibrium of motion and frictionless flow the winds will blow exactly parallel to the isobars, — that is, perpendicular to the gradient which produces and sustains the motion. Such winds are called gradient winds. The anomalous condition of flow of terrestrial winds perpendicular to the moving force is the result of the modifications of atmospheric motions due to the deflective influence of the earth's rotation, and to that other influence due to the inertia reaction of matter when it is constrained to move in a curved path, and commonly called centrifugal force. The equations for gradient wind motions have long been known to meteorologists from the work of Ferrel and others, and may be written in the following form:

For Cyclones

$$V = r\left[\sqrt{\omega^2 \sin^2 \phi + \frac{\Delta P}{\rho r}} - \omega \sin \phi\right] \tag{1}$$

For Anticyclones

$$V = r\left[\omega \sin \phi - \sqrt{\omega^2 \sin^2 \phi - \frac{\Delta P}{\rho r}}\right] \tag{2}$$

In C. G. S. Units, $V$ = velocity of the gradient wind in centimeters per second; $r$ = radius of curvature of isobars in centimeters; $\Delta P$ = pressure gradient in dynes per square centimeter per centimeter; $\rho$ = density of air in grams per cubic centimeter; $\omega$ = angular velocity of the earth's rotation per second $= \frac{2\pi}{86164}$, and $\phi$ = latitude. In the Northern Hemisphere the winds gyrate counterclockwise in cyclones and clockwise in anticyclones. These gyrations are in the reversed direction each to each in the Southern Hemisphere.

In equation (2) the values of $V$ are imaginary for values of $\frac{\Delta P}{\rho r}$ greater than $\omega^2 \sin^2\phi$. The equality $\frac{\Delta P}{\rho r} = \omega^2 \sin^2\phi$, or $r = \frac{\Delta P}{\rho\omega^2 \sin^2\phi}$ defines and fixes an isobar with minimum curvature in anticyclones. Winds cannot flow parallel to the isobars within this critical isobar. For this isobar the gradient wind has its maximum value $V_c = \frac{\Delta P}{\rho\omega \sin\phi}$. For the same gradient and for an isobar with the same curvature in a cyclone the gradient velocity is $V_l = V_c(\sqrt{2} - 1) = 0.414\, V_c$.

When the isobars are parallel straight lines, a condition very often closely realized in nature, $r = \infty$ and the gradient winds have the value given by either (1) or (2) after squaring, namely,

$$V_{r=\infty} = V_s = \frac{\Delta P}{2\,\rho\omega \sin\phi} = \frac{1}{2} V_c.$$

For practical units equation (1) becomes

Units of pressure.

$$V = R\left[\begin{array}{ll} \sqrt{.0053173 \sin^2\phi + \frac{1}{10\,R\rho d}} - .07292 \sin\phi & \text{(I) (Millibars)} \\ \sqrt{.0053173 \sin^2\phi + \frac{.13333}{R\rho d}} - .07292 \sin\phi & \text{(II) (Millimeters)} \\ \sqrt{.068914 \sin^2\phi + \frac{1.6946}{R\rho d}} - .26252 \sin\phi & \text{(III) (Inches)} \end{array}\right.$$

$V$ = velocities in meters per second in (I) and (II) and in miles per hour in (III).

$R$ = radius of curvature of isobar (wind path) in kilometers in (I) and (II) and in miles in (III).

The gradient is to be deduced from isobars drawn for pressure intervals of 1 millibar in (I), 1 millimeter in (II) and $\frac{1}{10}$ inch in (III); $d$, is the perpendicular distance between isobars (as above defined) in kilometers in (I) and (II), and in miles in (III).

$\rho$ = density of air = grams per cubic centimeter in all cases.

Also

Units of pressure.

$$V_c = \begin{bmatrix} \dfrac{1.3713}{\rho d \sin\phi} & \text{(IV)} \\ \dfrac{1.8284}{\rho d \sin\phi} & \text{(V)} \\ \dfrac{6.4552}{\rho d \sin\phi} & \text{(VI)} \end{bmatrix} \quad \text{and } R_c = \begin{bmatrix} \dfrac{18.806}{\rho d \sin^2\phi} & \text{(VII) (Millibars)} \\ \dfrac{25.073}{\rho d \sin^2\phi} & \text{(VIII) (Millimeters)} \\ \dfrac{24.590}{\rho d \sin^2\phi} & \text{(IX) (Inches)} \end{bmatrix}$$

*Radius of critical curvature and velocities of gradient winds for frictionless motion in Highs and Lows.*

**Table 42.** *English Measures.* **TABLES 42, 43.**

**Table 43.** *Metric Measures.*

These tables give the radius of curvature of the critical isobar in anticyclones, computed from the equation

$$R_c = \frac{\Delta P}{\rho\omega^2 \sin^2\phi};$$

the velocity of the wind on this isobar, computed from the equation

$$V_c = \frac{\Delta P}{\rho\omega \sin\phi};$$

the velocity of the wind on a straight isobar, computed from the equation

$$V_s = \frac{\Delta P}{2\,\rho\omega\sin\phi} = \frac{1}{2}\,V_c; \text{ and}$$

the velocity of the wind in a cyclone having the same gradient as the anticyclone, and on an isobar having a radius of curvature equal to $R_c$, computed from the equation

$$V_1 = V_c\,(\sqrt{2} - 1) = 0.414\,V_c$$

Table 42, English measures, gives values of $R_c$, in miles, and of $V_c$ High, $V_s$, and $V$ Low, in miles per hour. The side argument is the latitude for 10°, and at 5° intervals from 20° to 90°, inclusive. The top argument, $d$, is the perpendicular distance in miles between isobars drawn for pressure intervals of $\frac{1}{10}$ inch. For values of $d$ one tenth as great as given in the heading of the table the values of $R_c$, $V_c$ High, $V_s$, and $V$ Low are increased tenfold.

Table 43, metric measures, gives values of $R_c$ in kilometers, and of $V_c$ High, $V_s$, and V Low, in meters per second. The side argument is the same as in Table 42. The top argument, $d$, is the perpendicular distance in kilometers between isobars drawn for pressure intervals of 1 millimeter. For values of $d$ one tenth as great as given in the heading of the table the values of $R_c$, $V_c$ High, $V_s$, and $V$ Low are increased tenfold.

### REDUCTION OF TEMPERATURE TO SEA LEVEL.

**Table 44.** *English Measures.*

**Table 45.** *Metric Measures.*

These tables give for different altitudes and for different uniform rates of decrease of temperature with altitude, the amount in hundredths of a degree Fahrenheit and Centigrade, which must be added to observed temperatures in order to reduce them to sea level.

The rate of decrease of temperature with altitude varies from one region to another, and in the same region varies according to the season and the meteorological conditions; being in general greater in warm latitudes than in cold ones, greater in summer than in winter, and greater in areas of falling pressure than in areas of rising pressure. For continental plateau regions, the reduction often becomes fictitious or illusory. The use of the tables therefore requires experience and judgment in selecting the rate of decrease of temperature to be used. Much experimental work is now in progress with kites and balloons to determine average vertical gradients. It must be remembered that the tables here given are not tables giving the data as recently determined for various elevations.

The tables are given in order to facilitate the reduction of temperature either upward or downward in special investigations, but the reduction is not ordinarily applied to meteorological observations.

The tables, 44 and 45, are computed for rates of temperature change ranging from 1° Fahrenheit in 200 feet to 1° Fahrenheit in 900 feet, and from 1° Centigrade in 100 meters to 1° Centigrade in 500 meters; and for altitudes up to 5000 feet and 3000 meters respectively.

**Example, Table 44.**

| | |
|---|---|
| Observed temperature at an elevation of 2,500 feet, | 52°.5 *F.* |
| Reduction to sea level for an assumed decrease in temperature of 1° *F.* for every 300 feet, | + 8°.3 |
| Temperature reduced to sea level, | 60°.8 *F.* |

**Example, Table 45.**

| | |
|---|---|
| Observed temperature at an elevation of 500 meters, | 12°.5 *C.* |
| Reduction to sea level for an assumed decrease in temperature of 1° *C.* for every 200 meters, | + 2°.5 |
| Temperature reduced to sea level, | 15°.0 *C.* |

## BAROMETRICAL TABLES.

### REDUCTION TO A STANDARD TEMPERATURE OF OBSERVATIONS MADE WITH MERCURIAL BAROMETERS HAVING BRASS SCALES.

The indicated height of the mercurial column in a barometer varies not only with changes of atmospheric pressure, but also with variations of the temperature of the mercury and of the scale. It is evident therefore that if the height of the barometric column is to be a true relative measure of atmospheric pressure, the observed readings must be reduced to the values they would have if the mercury and scale were maintained at a constant standard temperature. This reduction is known as the reduction for temperature, and combines both the correction for the expansion of the mercury and that for the expansion of the scale, on the assumption that the attached thermometer gives the temperature both of the mercury and of the scale.

The freezing point is universally adopted as the standard temperature of the mercury, to which all readings are to be reduced. The temperature to which the scale is reduced is the normal or standard temperature of the adopted standard of length. For English scales, which depend upon the English yard, this is 62° Fahrenheit. For metric scales, which depend upon the meter, it is 0° Centigrade. As thus reduced, observations made with English and metric barometers become perfectly comparable when converted by the ordinary tables of linear conversion, viz: inches to millimeters and millimeters to inches (see Tables 9, 10), for these conversions refer to the meter at 0° Centigrade and the English yard at 62° Fahrenheit.

Prof. C. F. Marvin in the Monthly Weather Review for July, 1898, has pointed out the necessity of caution in conversion of metric and English barometer readings:

**Example:**

Attached thermometer, $25\overset{\circ}{.}4$ *C.*
Barometer reading, 762.15 mm.

If the temperature is converted to Fahrenheit = $77\overset{\circ}{.}7$ and the reading to 30.006 in., the temperature correction according to table 47 would be —0.133 inch and the reduced reading 29.873. *This would be erroneous.* The correct conversion is found by taking the correction corresponding to $25\overset{\circ}{.}4$ *C.* and 762 mm., *i.e.*, – 3.15 mm., which gives a corrected reading of 759 mm., and converted into inches gives 29.882 which is the correct result.

Professor Marvin further remarks that circumstances sometimes arise in which a Centigrade thermometer may be used to determine the temperature of an English barometer, or a Fahrenheit attached thermometer may be used with a metric scale. In all such cases the temperature must be brought into the same system of units as the observed scale reading before corrections can be applied, and the observed reading must then be corrected for temperature before any conversion can be made.

With aneroid barometers corrections for temperature and instrumental error must be determined for each instrument.

The general formula for reducing mercurial barometers with brass scales to the standard temperature is

$$C = -B\,\frac{m\,(t-T)-l\,(t-\theta)}{1+m\,(t-T)},$$

in which $C$ = Correction for temperature.
$B$ = Observed height of the barometric column.
$t$ = Temperature of the attached thermometer.
$T$ = Standard temperature of the mercury.
$m$ = Coefficient of expansion of mercury.
$l$ = Coefficient of linear expansion of brass.
$\theta$ = Standard temperature of the scale.

The accepted determination of the coefficient of expansion of mercury is that given by Broch's reduction of Regnault's experiments, viz:

$$m \text{ (for } 1^\circ \text{ } C.) = 10^{-9}\,(181792 + 0.175t + 0.035116t^2).$$

As a sufficiently accurate approximation, the intermediate value

$$m = 0.0001818$$

has been adopted uniformly for all temperatures in conformity with the usage of the *International Meteorological Tables.*

Various specimens of brass scales made of alloys of different composition show differences in their coefficients of expansion amounting to eight and sometimes ten per cent. of the total amount. The *Smithsonian Tables* prepared by Prof. Guyot were computed with the average value $l$ (for $1^\circ$ $C.$) = 0.0000188; for the sake of uniformity with the *International Meteorological Tables*, the value

$$l = 0.0000184$$

has been used in the present volume. For any individual scale, either value may easily be in error by four per cent.

A small portion of the tables has been independently computed, but the larger part of the values have been copied from the *International Meteorological Tables*, one inaccuracy having been found and corrected.

**Table 46.** *Reduction of the barometer to standard temperature — English measures.*

For the English barometer the formula for reducing observed readings to a standard temperature becomes

$$C = -B\,\frac{m\,(t - 32^\circ) - l\,(t - 62^\circ)}{1 + m\,(t - 32^\circ)}$$

in which $B$ = Observed height of the barometer in English inches.
$t$ = Temperature of attached thermometer in degrees Fahrenheit.

$$m = 0.0001818 \times \frac{5}{9} = 0.000101$$

$$l = 0.0000184 \times \frac{5}{9} = 0.0000102$$

The combined reduction of the mercury to the freezing point and of the scale to 62° Fahrenheit brings the point of no correction to approximately 28°.5 Fahrenheit. For temperatures above 28°.5 Fahrenheit, the correction is subtractive, and for temperatures below 28°.5 Fahrenheit, the correction is additive, as indicated by the signs (+) and (−) inserted throughout the table.

The table gives the corrections for every half degree Fahrenheit from 0° to 100°. The limits of pressure are 19 and 31.6 inches, the corrections being computed for every half inch from 19 to 24 inches, and for every two-tenths of an inch from 24 to 31.6 inches.

**Example:**

| | | |
|---|---|---|
| Observed height of barometer | = | 29.143 |
| Attached thermometer, 54°.5 *F.* | | |
| Reduction for temperature | = − | 0.068 |
| Barometric reading corrected for temperature | = | 29.075 |

TABLE 47.

**TABLE 47.** *Reduction of the barometer to standard temperature — Metric measures.*

For the metric barometer the formula for reducing observed readings to the standard temperature, 0° *C.*, becomes

$$C = -B\frac{(m-l)t}{1+mt}$$

in which $C$ and $B$ are expressed in millimeters and $t$ in Centigrade degrees.

$m = 0.0001818; \quad l = 0.0000184.$

In the table, the limits adopted for the pressure are 440 and 795 millimeters, the intervals being 10 millimeters between 440 and 600 millimeters, and 5 millimeters between 600 and 795 millimeters.

The limits adopted for the temperature are 0° and + 35°.8, the intervals being 0°.5 and 1°.0 from 440 to 560 millimeters, and 0°.2 from 560 to 795 millimeters.

For temperatures above 0° Centigrade the correction is *negative*, and hence is to be subtracted from the observed readings.

For temperatures below 0° Centigrade the correction is *positive*, and from 0° *C.* down to − 20° *C.* the numerical values thereof, for ordinary barometric work, do not materially differ from the values for the corresponding temperatures above 0° *C.* Thus the correction for − 9° *C.* is *numerically* the same as for + 9° *C.* and is taken from the table. In physical work of extreme precision, the numerical values given for positive temperatures may be used for temperatures below 0° *C.* by applying to them the following corrections:

*Corrections to be applied to the tabular values of Table 47 in order to use them when the temperature of the attached thermometer is below 0° Centigrade.*

| Temperature. | PRESSURE IN MILLIMETERS. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| − 1° | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| − 9 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| −10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | +0.01 | +0.01 | +0.01 |
| 11 | .00 | .00 | .00 | .00 | +0.01 | .01 | .01 | .01 |
| 12 | .00 | .00 | .00 | +0.01 | .01 | .01 | .01 | .01 |
| 13 | .00 | .00 | +0.01 | .01 | .01 | .01 | .01 | .01 |
| −14 | .00 | +0.01 | .01 | .01 | .01 | .01 | .01 | .01 |
| −15 | +0.01 | +0.01 | +0.01 | +0.01 | +0.01 | +0.01 | +0.01 | +0.01 |
| 16 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .01 |
| 17 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .02 |
| 18 | .01 | .01 | .01 | .01 | .01 | .01 | .01 | .02 |
| −19 | .01 | .01 | .01 | .01 | .01 | .01 | .02 | .02 |
| −20 | +0.01 | +0.01 | +0.01 | +0.01 | +0.01 | +0.02 | +0.02 | +0.02 |
| 21 | .01 | .01 | .01 | .02 | .02 | .02 | .02 | .02 |
| 22 | .01 | .01 | .02 | .02 | .02 | .02 | .02 | .02 |
| 23 | .01 | .02 | .02 | .02 | .02 | .02 | .02 | .02 |
| −24 | .01 | .02 | .02 | .02 | .02 | .02 | .02 | .03 |

Example:

Observed height of barometer, 763.17$^{mm.}$: Temperature of the attached thermometer, − 12° *C.*

| | | |
|---|---|---|
| Numerical value of the reduction for + 12° *C.* | = | 1.50 |
| Correction for temperature below 0° *C.* | = + | 0.01 |
| Reduction for − 12° *C.* | = + | 1.51 |
| Observed height of barometer | = | 763.17 |
| Barometer corrected for temperature | = | 764.68 |

## REDUCTION OF THE MERCURIAL BAROMETER TO STANDARD GRAVITY.

**Tables 48, 49, 50.**

The mercurial barometer does not directly measure the atmospheric pressure. The latter is proportional to the weight of the mercurial column, and also to its height after certain corrections have been applied. Since the height of the barometric column is easily measured, by common consent the pressures are expressed in terms of this corrected height.

The observed height of the barometer changes with the temperature of the mercury as already shown, and also with the variations in the value of gravity, as well as with the pressure. Therefore, to obtain a height that shall be a true relative measure of the atmospheric pressure, the observed height of the mercurial column must not only be reduced to what its height would be if at a standard temperature, but also to what it would be at a standard value of gravity.

As stated on page xviii, the standard value of gravity adopted is 980.665 dynes. At the time of its adoption this value was assumed to apply for "latitude 45° and sea-level" on the basis of the absolute determination of $g$ at the International Bureau by Defforges, 1887–1890 (Procés-Verbaux, Comité Inter. d. Poids et Mesures, 1887, pp. 27–28, 86; 1891, p. 135).

More recent determinations,[1] based upon numerous measurements in all parts of the world, and assuming a certain ideal figure for the earth, give for the mean value of $g$ at latitude 45° and sea level the value 980.621 dynes. This differs from the standard value by 0.044 dyne. Departures of this magnitude from the mean sea-level gravity of a given latitude are frequently encountered, and in some cases surpassed. They are attributed to topography and isostatic compensation, and to gravity anomalies. For example, according to Bowie,[2] at Pikes Peak, Colo., the correction for topography and compensation is + 0.187 dyne, while the gravity anomaly[3] is + 0.021 dyne, giving a total gravity departure of + 0.208 dyne. Also, at Seattle, Wash., from the mean of measurements at two stations, the correction for topography and compensation is − 0.019 dyne[4] and the gravity anomaly is − 0.093 dyne,[5] giving a total gravity departure of − 0.112 dyne. The gravity departure at Pikes Peak is sufficient to cause the barometer to read 0.004 inch or 0.10 mm. low, while the departure at Seattle is sufficient to cause the barometer to read 0.003 inch or 0.09 mm. high, as compared with what the readings would have been with gravity at normal intensity for the latitudes of the respective stations.

From the foregoing it is evident that the value of local gravity, $g_l$, at the observing station must be determined before the barometer reading can be accurately reduced to standard gravity. In many cases, and especially at sea, it is not practicable to measure $g_l$. In the United States its value may frequently be determined with sufficient accuracy in the following manner:

(1) Compute $g_\phi$, mean gravity at sea level for the latitude of the station, from the equation[6]

$$g_\phi = 978.039\ (1 + 0.005294 \sin^2\phi - 0.000007 \sin^2 2\phi),$$
$$= 980.621\ (1 - 0.002640 \cos 2\phi + 0.000007 \cos^2 2\phi)$$

(2) Correct $g_\phi$ for altitude by the equation[7]

$$c \text{ (dynes)} = -\ 0.0003086\ h \text{ (meters), or}$$
$$c \text{ (dynes)} = -\ 0.000094\ h \text{ (feet),}$$

---

[1] Investigations of gravity and isostasy, by William Bowie. U.S. Coast and Geodetic Survey, Special Publication No. 40, 1917, p. 134.
[2] Op. cit. p. 50. [3] Op. cit. p. 59. [4] Op. cit. p. 50. [5] Op. cit. p. 59.
[6] Bowie, op. cit. p. 134. [7] Bowie, op. cit. p. 93.

where $h$ is the altitude of the station above sea level.

(3) Correct $g_\phi$ for gravity anomaly.[1]

(4) Finally, $g_\phi$ is to be corrected for topography and isostatic compensation.[2]

Example:

| | | | |
|---|---|---|---|
| To determine the value of local gravity $g_l$, at the Weather Bureau Office, Atlanta, Ga., latitude 33° 45′ N., longitude 84° 23′ W., height of barometer above sea level, 1218 feet. | | | |
| From Table 83, mean sea level gravity for latitude 33° 45′ | = | 979.631 | dynes. |
| Correction for height of barometer (−0.000094 ×1218) | = − | 0.114 | " |
| Correction for gravity anomaly, | = − | 0.023 | " |
| Correction for topography and compensation | = + | 0.014 | " |
| Local gravity at Weather Bureau Office, Atlanta, Ga. | = | 979.508 | dynes. |

Having determined $g_l$, the reduction of barometer readings to standard gravity is easily and accurately accomplished by multiplying by the ratio $g_l/g$, or by applying a correction to the barometer reading, otherwise corrected, derived from the expression $\frac{(g_l - g)}{g} B$. With $g_l < g$ the correction is to be subtracted; with $g_l > g$ the correction is to be added. In general, sufficient accuracy will be attained by computing the gravity correction for a station once for all from the equation $C = B_n \frac{(g_l - g)}{g}$, in which $B_n$ is the normal station barometer pressure, and $C$ is expressed in the same units as $B_n$.

**Table 48** gives corrections to reduce barometer readings to standard gravity. The top argument is the barometer reading. The side argument is the difference, $g_l - g$, for each tenth of a dyne up to 4.0 dynes. The relation is a linear function of both $g_l - g$ and $B$, and for barometer readings 10 or 100 times greater than those given in the argument the correction may be obtained by removing the decimal point in the tabulated values one or two places, respectively, to the right. The correction obtained will be expressed in the same units as the barometer reading to be corrected.

[1] In most cases the gravity anomaly may be obtained from Bowie's paper, op. cit., figure 11.

[2] In some cases this correction may be obtained from Bowie's paper, op. cit., pp. 50–52, but in many cases, and especially in mountainous districts, it must be separately computed for each station.

**Example 1.**

The barometer reading corrected for temperature is 29.647 inches, and the local value of gravity is 978.08. The difference, $g_l - g$, $= -2.585$. From the table,

| | | |
|---|---|---|
| the correction for a barometer reading of 20 inches | = | − 0.0527 in. |
| the correction for a barometer reading of 9 inches | = | − 0.0237 in. |
| the correction for a barometer reading of 0.65 inches | = | − 0.0017 in. |
| Correction for a barometer reading of 29.65 inches | = | − 0.078 in. |
| Corrected barometer reading = 29.647 in. − 0.078 in. | = | 29.569 in. |

**Example 2.**

The barometer reading reduced to 0° *C.* is 637.42 mm., and the local value of gravity is 981.51. The difference, $g_l - g = + 0.845$. From the table,

| | | |
|---|---|---|
| the correction for a barometer reading of 600 mm. | = | + 0.517 mm. |
| the correction for a barometer reading of 30 mm. | = | + 0.026 mm. |
| the correction for a barometer reading of 7 mm. | = | + 0.006 mm. |
| Correction for a barometer reading of 637.4 mm. | = | + 0.55 mm. |
| Corrected barometer reading = 637.42 + 0.55 | = | + 637.97 mm. |

In the case of barometer readings made at sea, and also at some land stations, it is not practicable to determine local gravity with greater accuracy than it can be computed from the equations for variation with latitude and altitude given above. The reduction to standard gravity, accordingly, consists of two parts — a correction for altitude, and a correction from the computed sea-level gravity for the latitude of the station to standard gravity. The first part of the correction, or the correction for altitude, may be computed once for all from the expression $c = -0.0003086\ h\ B_n$ (metric measures), or $c = -0.000094\ h\ B_n$ (English measures), and is usually combined with the reduction of the barometer to sea level or to some other reference plane. The second part has heretofore consisted of a correction for the difference between the mean value of gravity for the latitude of the station and for latitude 45°; and, in accordance with the equation given above, it may be derived from the expression

$$(-0.002640 \cos 2\phi + 0.000007 \cos^2 2\phi)\ B$$

where $\phi$ is the latitude of the station, and $B$ is the barometer reading. The value of the ratio $\frac{g_{45^\circ} - g}{g} = \frac{980.621 - 980.665}{980.665} = -0.000045$. Therefore, the expression for the gravity correction becomes

$$(-0.00264 \cos 2\phi + 0.000007 \cos^2 2\phi - 0.000045)\ B$$

**Table 49** (*English measures*) gives the corrections in thousandths of an inch for every degree of latitude and for each inch of barometric pressure from 19 to 30 inches, to reduce barometer readings to standard gravity, computed from the equation

$$C = (-0.00264 \cos 2\phi + 0.000007 \cos^2 2\phi - 0.000045)\, B$$

**Table 50** (*metric measures*) gives the same corrections in hundredths of a millimeter for each 20 millimeters barometric pressure from 520 to 780 millimeters.

**Example:**

| | |
|---|---|
| Barometric reading (corrected for temperature) at latitude 63° 55′, . | = 27.434 inches |
| Correction to standard gravity, Table 49, | = 0.043 inches |
| Barometer reduced to standard gravity, | = 27.477 inches |

The adoption of this new value for standard gravity may require a slight correction to old barometric records in order to make the entire series of readings homogeneous. The amount of this correction will be the difference between the gravity correction computed by these new tables and by the old tables.

**Example:**

Seattle, Wash., Lat. 47° 38′ N. Long. 122° 20′ W., height of barometer above sea level 125 feet, normal station barometer 29.89 inches.

| | | |
|---|---|---|
| $g_\phi$ (Table 83) | = | 980.859 dynes. |
| Correction for height ($-0.000094 \times 125$) | = − | .012 " |
| Correction for topography and compensation | = − | .019 " |
| Correction for gravity anomaly | = − | .093 " |
| Value of local gravity | | 980.735 dynes. |

Correction to reduce barometer readings to standard gravity, $\frac{980.735 - 980.665}{980.665} B_n = +0.002$ inch. Old correction, $+0.007$; correction to old records $= 0.002$ in. $- 0.007$ in. $= -0.005$ in.

For correcting back records of readings at sea, or at any place where the value of local gravity cannot be determined, the correction is equal to the ratio $\frac{980.599 - 980.665}{980.665} B = -0.000067\, B$. The corrections are as follows:

| Barometer reading. | Correction. |
|---|---|
| From 7 to 22 inches | − 0.001 in. |
| From 23 to 32 inches | − 0.002 in. |
| From 380 to 520 mm. | − 0.03 mm. |
| From 530 to 670 mm. | − 0.04 mm. |
| From 680 to 820 mm. | − 0.05 mm. |

## THE HYPSOMETRIC FORMULA AND ITS CONSTANTS.

The fundamental formula for reducing the barometer to sea level and for determining heights by the barometer is the original formula of Laplace, amplified into the following form —

$$(1)\quad Z = K(1+\alpha\theta)\left(\frac{1}{1-0.378\frac{e}{b}}\right)\left(1+\frac{g-g_l}{g}\right)\left(1+\frac{h+h_0}{R}\right)\log\frac{p_0}{p},$$

or, where $g_l$, the value of local gravity is unknown,

$$(2)\quad Z = K(1+\alpha\theta)\left(\frac{1}{1-0.378\frac{e}{b}}\right)(1+k\cos 2\phi - k'\cos^2 2\phi + C)\left(1+\frac{h+h_0}{R}\right)\log\frac{p_0}{p}$$

in which

$h$ = Height of the upper station.
$h_0$ = Height of the lower station.
$Z = h - h_0$.
$p$ = Atmospheric pressure at the upper station.
$p_0$ = Atmospheric pressure at the lower station.
$R$ = Mean radius of the earth.
$\theta$ = Mean temperature of the air column between the altitudes $h$ and $h_0$.
$e$ = Mean pressure of aqueous vapor in the air column.
$b$ = Mean barometric pressure of the air column.
$\phi$ = Latitude of the stations.
$K$ = Barometric constant.
$\alpha$ = Coefficient of the expansion of air.
$k$ and $k'$ = Constants depending on the figure of the earth.
$C$ = Constant = the ratio $\frac{g_{45^\circ}-g}{g}$.
$g$ = standard value of gravity = 980.665 dynes.
$g_l$ = Local value of gravity.

The pressures $p_0$ and $p$ are computed from the height of the column of mercury at the two stations; the ratio $\frac{B_0}{B}$ of the barometric heights may be substituted for the ratio $\frac{p_0}{p}$, if $B_0$ and $B$ are reduced to the values that would be measured at the same temperature and under the same relative value of gravity.

The correction of the observed barometric heights for instrumental temperature is always separately made, but the correction for the variation of gravity with altitude is generally introduced into the formula itself.

If $B_0$, $B$ represent the barometric heights corrected for temperature only, we have the equation

$$\frac{p_0}{p} = \frac{B_0}{B}\left(1+\mu\frac{Z}{R}\right),$$

$\mu$ being a constant depending on the variation of gravity with altitude $\left(\frac{\mu}{R} = 0.0000003\right)$, and

$$\log \frac{p_0}{p} = \log \frac{B_0}{B} + \log\left(1 + \mu \frac{Z}{R}\right).$$

Since $\frac{\mu Z}{R}$ is a very small fraction, we may write

$$\text{Nap. } \log\left(1 + \frac{\mu Z}{R}\right) = \frac{\mu Z}{R}, \text{ and } \log\left(1 + \frac{\mu Z}{R}\right) = \frac{\mu Z}{R} M,$$

$M$ being the modulus of common logarithms.

By substituting for $Z$ its approximate value $Z = K \log \frac{B_0}{B}$, we have

$$\log\left(1 + \frac{\mu Z}{R}\right) = \frac{\mu K}{R} M \log \frac{B_0}{B}.$$

With these substitutions the barometric formula becomes

(1) $$Z = K(1 + \alpha\theta)\left(\frac{1}{1 - 0.378\frac{e}{b}}\right)\left(1 + \frac{g - g_1}{g}\right)\left(1 + \frac{h + h_0}{R}\right) \times \left(1 + \frac{\mu K}{R} M\right) \log \frac{B_0}{B}, \text{ or}$$

(2) $$Z = K(1 + \alpha\theta)\left(\frac{1}{1 - 0.378\frac{e}{b}}\right)(1 + k \cos 2\phi - k' \cos^2 2\phi + C)\left(1 + \frac{h + h_0}{R}\right) \times \left(1 + \frac{\mu K}{R} M\right) \log \frac{B_0}{B}.$$

As a further simplification we shall put

$$\beta = 0.378\frac{e}{b}, \ \gamma = k \cos 2\phi - k' \cos^2 2\phi + C \text{ and } \eta = \frac{\mu K}{R} M,$$

and write for the second form, (2), the formula —

$$Z = K(1 + \alpha\theta)\left(\frac{1}{1 - \beta}\right)(1 + \gamma)\left(1 + \frac{h + h_0}{R}\right)(1 + \eta) \log \frac{B_0}{B}.$$

*Values of the constants.* — The barometric constant $K$ is a complex quantity defined by the equation

$$K = \frac{\Delta \times B_n}{\delta \times M}.$$

$B_n$ is the normal barometric height of Laplace, 760 *mm.*

$\Delta$ is the density of mercury at the temperature of melting ice. The value adopted by the International Meteorological Committee, and which has been employed in previous editions of these tables is $\Delta = 13.5956$. The most probable value, taking into account the recently determined relation between the liter and the cubic decimeter,[1] is as already stated, $\Delta = 13.5951$ and this value is here adopted.

$\delta$ is the density of dry air at $0°C$ under the pressure of a column of mercury $B_n$ and under standard gravity. The value adopted by the International Bureau of Weights and Measures for air under the above conditions and free from $CO_2$ is $\delta = 0.0012928$ grams per cubic centimeter.[2] This is in close agreement with the value ($\delta = 0.00129278$) used in previous editions of these tables. For air containing 4 parts in 10000 of $CO_2$ it gives a density of 0.00129307, and for air containing 3 parts in 10000 of $CO_2$, the proportion adopted by Hann,[3] it gives a density of 0.00129301. Therefore, the value adopted for the density of air containing an average amount of $CO_2$ is

$$\delta = 0.0012930$$

$M$ (Modulus of common logarithms) $= 0.4342945$. These numbers give for the value of the barometric constant

$$K = 18400 \text{ meters.}$$

For the remaining constants, the following values have been used:

$\alpha = 0.00367$ for $1°$ Centigrade. (International Bureau of Weights and Measures: *Travaux et Mémoires*, t. I, p. A. 54.)

$\lambda = k \cos 2\phi - k' \cos^2 2\phi + C = 0.002640 \cos 2\phi - 0.000007 \cos^2 2\phi + 0.000045$

$R = 6367324$ meters. (A. R. Clarke: *Geodesy*, 8°, Oxford, 1880.)

$\eta = \dfrac{\mu K M}{R} = 0.002396$. (Ferrel: *Report Chief Signal Officer*, 1885, pt. 2, pp. 17 and 393.)

TABLES 51, 52, 53, 54, 55.

## THE DETERMINATION OF HEIGHTS BY THE BAROMETER.

**Tables 51, 52, 53, 54, 55.**

*English Measures.*

Since a barometric determination of the height will rarely be made at a place where $g_l$ is known, the discussion which follows will be confined to the second form of the barometric formula developed in the preceding section (see page xxxix). For convenience in computing heights it is arranged in the following form:

$$Z = K(\log B_0 - \log B)\begin{bmatrix}(1+\alpha\theta) \\ (1+\beta) \\ (1 + k\cos 2\phi - k'\cos^2 2\phi + C)(1+\eta) \\ \left(1 + \dfrac{Z + 2h_0}{R}\right)\end{bmatrix}$$

---

[1] Comptes Rendus, Quatrième Conférence Générale Poids et Mesures, 1907, pp. 60–61.

[2] Leduc, l.c.

[3] Lehrbuch der Meteorologie, dritte Auflage, 1915, s. 5.

in which $K$ ($\log B_0 - \log B$) is an approximate value of $Z$ and the factors in the brackets are correction factors depending respectively on the air temperature, the humidity, the variation of gravity with latitude, the variation of gravity with altitude in its effect on the weight of mercury in the barometer, and the variation of gravity with altitude in its effect on the weight of the air. With the constants already given, the formula becomes in English measures:

$$Z \text{ (feet)} = 60368^{1} (\log B_0 - \log B) \begin{bmatrix} [1 + 0.002039\,(\theta - 32°)] \\ (1 + \beta) \\ (1 + 0.002640 \cos 2\phi - 0.000007 \cos^2 2\phi \\ \qquad + 0.000045)\ (1 + 0.00239) \\ \left(1 + \dfrac{Z + 2h_0}{R}\right) \end{bmatrix}$$

In order to make the temperature correction as small as possible for average air temperatures, 50° *F.* will be taken as the temperature at which the correction factor is zero. This is accomplished by the following transformation:

$$1 + 0.002039\,(\theta - 32°) = [1 + 0.002039\,(\theta - 50°)]\,[1 + 0.0010195 \times 36°].$$

The second factor of this expression combines with the constant, and gives $60368\,(1 + 0.0010195 \times 36°) = 62583.6$.

The first approximate value of $Z$ is therefore

$$62583.6\,(\log B_0 - \log B).$$

In order further to increase the utility of the tables, we shall make a further substitution for $\log B_0 - \log B$, and write

$$62583.6\,(\log B_0 - \log B) = 62583.6\left(\log \frac{29.9}{B} - \log \frac{29.9}{B_0}\right).$$

**Table 51** contains values of the expression

$$62583.6 \log \frac{29.9}{B}$$

for values of $B$ varying by intervals of 0.01 inch from 12.00 inches to 30.90 inches.

The first approximate value of $Z$ is then obtained by subtracting the tabular value corresponding to $B_0$ from the tabular value corresponding to $B$ ($B$ and $B_0$ being the barometric readings observed and corrected for temperature at the upper and lower stations respectively).

**Table 52** gives the temperature correction

$$Z \times 0.002039\,(\theta - 50°).$$

[1] In accordance with the relation between the meter and the foot given on p. xix, this constant should be 60367. (See Table 14.)

The side argument is the mean temperature of the air column ($\theta$) given for intervals of 1° from 0° to 100° *F.* The top argument is the approximate difference of altitude *Z* obtained from Table 51.

For temperatures above 50° *F.*, the correction is to be added, and for temperatures below 50° *F.*, the correction is to be subtracted. It will be observed that the correction is a linear function of *Z*, and hence, for example, the value for $Z = 1740$ is the sum of the corrections in the columns headed 1000, 700, and 40.

In general, accurate altitudes cannot be obtained unless the temperature used is freed from diurnal variation.

**Table 53** gives the correction for gravity, and for the effect of the variation of gravity with altitude on the weight of the mercury. When altitudes are determined with aneroid barometers the second factor does not enter the formula. In this case the effect of the latitude factor can be obtained by taking the difference between the tabular value for the given latitude and the tabular value for latitude 45° 29′. The side argument is the latitude of the station given for intervals of 2°. The top argument is the approximate difference of height *Z*.

**Table 54** gives the correction for the average humidity of the air at different temperatures. In evaluating the humidity factor as a function of the air temperature, the tables given by Prof. Ferrel have been adopted (*Meteorological researches. Part iii. — Barometric hypsometry and reduction of the barometer to sea level.* Report, U.S. Coast Survey, 1881. Appendix 10.) These tables by interpolation, and by extrapolation below 0° *F.*, give the following values for $\beta$:

For Fahrenheit temperatures,

| $\theta$ | $\beta$ | $\theta$ | $\beta$ | $\theta$ | $\beta$ | $\theta$ | $\beta$ |
|---|---|---|---|---|---|---|---|
| F. | | F. | | F. | | F. | |
| −20° | 0.00008 | 10° | 0.00104 | 36° | 0.00267 | 62° | 0.00724 |
| −16 | .00020 | 12 | .00111 | 38 | .00293 | 64 | .00762 |
| −12 | .00032 | 14 | .00118 | 40 | .00322 | 66 | .00801 |
| − 8 | .00044 | 16 | .00126 | 42 | .00353 | 68 | .00839 |
| | | 18 | .00134 | 44 | .00386 | 70 | .00877 |
| − 6 | 0.00050 | 20 | .00143 | 46 | .00421 | 72 | .00914 |
| − 4 | .00056 | 22 | .00153 | 48 | .00458 | | |
| − 2 | .00062 | 24 | .00163 | 50 | .00496 | 76 | 0.00990 |
| 0 | .00068 | 26 | .00174 | 52 | .00534 | 80 | .01065 |
| + 2 | .00075 | 28 | .00187 | 54 | .00572 | 84 | .01141 |
| 4 | .00082 | 30 | .00203 | 56 | .00610 | 88 | .01217 |
| 6 | .00089 | 32 | .00222 | 58 | .00648 | 92 | .01293 |
| 8 | .00096 | 34 | .00243 | 60 | .00686 | 96 | .01369 |

This correction could have been incorporated with the temperature factor in Table 52, but it is given separately in order that the magnitude of the correction may be apparent, and in order that, when the actual humidity is observed, the correction may be computed if desired, by the expression

$$Z\left(0.378\,\frac{e}{b}\right)$$

where $e$ is the mean pressure of vapor in the air column, and $b$ the mean barometric pressure.

The side argument is the mean temperature of the air column, varying by intervals of 2° from − 20° *F.* to 96° *F.*, except near the extremities of the table where the interval is 4°. The top argument is the approximate difference of altitude $Z$.

**Table 55** gives the correction for the variation of gravity with altitude in its effect on the weight of the air. The side argument is the approximate difference of altitude $Z$, and the top argument is the elevation of the lower station $h_0$.

The corrections given by Tables 53, 54, and 55 are all additive.

**Example:**

Let the barometric pressure observed, and corrected for temperature, at the upper and lower stations be, respectively, $B$ = 23.61 and $B_0$ = 29.97. Let the mean temperature of the air column be 35° *F.*, and the latitude 44° 16′. To determine the difference of height.

| | Feet. |
|---|---|
| Table 51, argument 23.61, gives | 6420 |
| Table 51, " 29.97, " | − 64 |
| Approximate difference of height ($Z$) | = 6484 |
| Table 52, with $Z$ = 6484 and $\theta$ = 35° *F.*, gives | − 198 |
| Table 53, with $Z$ = 6300 and $\phi$ = 44°, gives | + 16 |
| Table 54, with $Z$ = 6300 and $\theta$ = 35° *F.*, gives | + 16 |
| Table 55, with $Z$ = 6300 and $h_0$ = 0, gives | + 2 |
| Final difference of height ($Z$) | = 6320 |

If in this example the barometric readings be observed with aneroid barometers, the correction to be obtained from Table 53 will be simply the portion due to the latitude factor, and this will be obtained by subtracting the tabular value for 45° 29′ from that for 44°, the top argument being $Z$ = 6300. This gives 16 − 15 = 1.

**Tables 56, 57, 58, 59, 60, 61, 62, 63.**

*Metric and Dynamic Measures.*

The barometric formula developed on page xli is, in metric and dynamic units,

$$Z\text{ (meters)} = 18400\,(\log B_0 - \log B)\left[\begin{array}{l}(1 + 0.00367\ \theta\ C.)\\(1 + 0.378\frac{e}{b})\\(1 + 0.002640\cos 2\phi - 0.000007\cos^2 2\phi\\\qquad + 0.000045)\ (1\ + 0.00239)\\\left(1 + \dfrac{Z + 2\,h_0}{6\ 367\ 324}\right)\end{array}\right]$$

The approximate value of $Z$ (the difference of height of the upper and lower station) is given by the factor 18400 ($\log B_0 - \log B$). This expression is computed by means of two entries of a table whose argument is the barometric pressure. In order that the two entries may result at once in an approximate value of the elevation of the upper and lower stations, a transformation is made, which gives the following identities:

$$18400\ (\log B_0 - \log B) = 18400\left(\log\frac{760}{B} - \log\frac{760}{B_0}\right)\text{— Metric measures,}$$

and $$18400\ (\log B_0 - \log B) = 18400\left(\log\frac{1013.3}{B} - \log\frac{1013.3}{B_0}\right)\text{— Dynamic}$$ measures.

**Table 56** gives values of the expression $18400 \log \frac{760}{B}$ for values of $B$ varying by intervals of 1 mm. from 300 mm. to 779 mm. The first approximate value of $Z$ is then obtained by subtracting the tabular value corresponding to $B_0$ from the tabular value corresponding to $B$ ($B$ and $B_0$ being the barometric readings observed and reduced to 0° $C$. at the upper and lower stations respectively). The first entry of Table 56 with the argument $B$ gives an approximate value of the elevation of the upper station above sea level, and the second entry with the argument $B_0$ gives an approximate value of the elevation of the lower station.

**Table 57** gives values of the expression $18400 \log \frac{1013.3}{B}$ for values of $B$ varying by intervals of 1 mb. from 0 mb. to 1049 mb. The approximate value of $Z$ is then obtained by subtracting the tabular value corresponding to $B_0$ from the tabular value corresponding to $B$ ($B$ and $B_0$ being the barometric readings observed and reduced to 0° $C$. at the upper and lower stations respectively). The first entry of Table 57 with the argument $B$ gives an approximate value of the elevation of the upper station above sea level, and the second entry with the argument $B_0$ gives an approximate value of the elevation of the lower station.

**Table 58** gives the temperature correction factor, $a = 0.00367\theta$, for each tenth of a degree centigrade, from 0° $C$. to 50.9° $C$. To find the correction corresponding to any mean temperature of the air column, $\theta$, multiply the approximate altitude as determined from Table 56 or 57 by the value of $a$ obtained from this table, and add the result if $\theta$ is above 0° $C$.; subtract, if below 0° $C$.

Attention is called to the fact that the formula is linear with respect to $\theta$, and hence that the correction, for example, for $59°.8$ *C.* equals the correction for $50°.8$ plus the correction for $9°$ or $.186 + .033 = .219$, and is to be added.

**Table 59** is an amplification of Table 58 and gives the temperature correction $0.00367\ \theta \times Z$.

The side argument is the approximate difference of elevation $Z$ and the top argument is the mean temperature of the air column. The values of $Z$ vary by intervals of 100 m. from 100 to 4000 meters and the temperature varies by intervals of 1° from 1° *C.* to 10° *C.* with additional columns for 20°, 30°, and 40° *C.* This formula also is linear with respect to $\theta$, and hence the correction, for example, for 27° equals the correction for 20° plus the correction for 7°. When the table is used for temperatures below 0° *C.* the tabular correction must be subtracted from, instead of added to, the approximate value of $Z$.

**Table 60** (pp. 149 and 150) gives the correction for humidity resulting from the factor $0.378\ \frac{e}{b} \times Z = \beta\ Z$.

Page 149 gives the value of $0.378\ \frac{e}{b}$ multiplied by 10000. The side argument is the mean pressure of aqueous vapor, $e$, which serves to represent the mean state of humidity of the air between the two stations. $e = \frac{1}{2}(e_1 + e_0)$ ($e_1$ and $e_0$ being the vapor pressures observed at the two stations) has been written at the head of the table, but the value to be assigned to $e$ is in reality left to the observer, independently of all hypothesis. The top argument is the mean barometric pressure $\frac{1}{2}\ (B + B_0)$.

The vapor pressure varies by millimeters from 1 to 40, and the mean barometric pressure varies by intervals of 20 mm. from 500 mm. to 760 mm. The tabular values represent the humidity factor $\beta$, or $0.378\ \frac{e}{b}$, multiplied by 10000.

Page 150 gives the correction for humidity, with $Z$ and $10000 \times 0.378\ \frac{e}{b}$ (derived from page 149) as arguments.

The approximate difference of altitude is given by intervals of 100 meters from 100 to 4000 meters, with additional lines for 5000, 6000, and 7000 meters. The values of $10000\ \beta$ vary by intervals of 25 from 25 to 300. The tabular values are given in tenths of meters to facilitate and increase the accuracy of interpolation.

**Table 61.** Humidity correction: Value of $\frac{1}{2}\left(\frac{0.378\frac{e}{b}}{0.00367}\right)$. It has been found advantageous to express the humidity term, $\beta Z$, as a correction to the temperature term, $\alpha\ \theta\ Z$.

Let $\alpha \Delta\ \theta\ Z = \beta\ Z$; then, $$\Delta\ \theta = \frac{\beta}{\alpha} = \frac{0.378\frac{e}{b}}{0.00367}.$$

For convenience in computing, the tabulated values of $\Delta\,\theta$ are for $\frac{1}{2}\left(\frac{0.378\frac{e}{b}}{0.00367}\right)$. The side and top arguments are air and vapor pressures, respectively, in mm. on p. 151 and in mb. on p. 152. Instead of computing $\Delta\,\theta$ from the mean of the values of $B$ and $e$ at the upper and lower stations it is computed for each station separately, and the sum of the two determinations is added to $\theta$.

**Table 62** gives the correction for gravity, and for the effect of the variation of gravity with altitude on the weight of the mercurial column. When altitudes are determined with aneroid barometers the latter factor does not enter the formula. In this case the effect of the latitude factor can be obtained by subtracting the tabular value for latitude 45° 29′ from the tabular value for the latitude in question.

The side argument is the approximate difference of elevation $Z$ varying by intervals of 100 meters from 100 to 4000, and by 500 meters from 4000 to 7000. The top argument is the latitude, varying by intervals of 5° from 0° to 75.°

**Table 63** gives the correction for the variation of gravity with altitude in its effect on the weight of the air.

The side argument is the same as in Table 62; the top argument is the height of the lower station, varying by intervals of 200 meters from 0 to 2000, with additional columns for 2500, 3000 and 4000 meters.

The corrections given in Table 62 and Table 63 apply to the approximate heights computed from metric or dynamic measures by the use of Tables 56 to 61, inclusive, and are additive.

**Example: (Metric Measures.)**

Let the barometric reading (reduced to 0° $C.$) at the upper station be 655.7 mm.; at the lower station, 772.4 mm. Let the mean temperature of the air column be $\theta = 12.^{\circ}3\ C.$, the mean vapor pressure $e =$ 9 mm. and the latitude $\phi = 32°$.

| | |
|---|---|
| Table 56, with argument 655.7, gives | 1179 meters. |
| Table 56, " " 772.4, " | − 129 |
| Approximate value of $Z$ | = 1308 |
| Table 59, with $Z = 1308$ and $\theta = 12.^{\circ}3\ C$, gives | 59 |
| Table 60, with $e = 9$ mm. and $Z = 1370$, gives | 7 |
| Table 62, with $Z = 1370$ and $\phi = 32°$, gives | 5 |
| Table 63, with $Z = 1370$ and $h_0 = 0$, gives | 0 |
| Corrected value of $Z$ | = 1379 meters. |

**Example: (Dynamic Measures.)**

Let the barometer reading (reduced to 0° $C.$) at the upper station be 448.6 mb.; at the lower station, 1000.3 mb. Let the vapor pressure at the upper station be 2.4 mb.; at the lower station 7.3 mb. Let the mean temperature of the air column be $\theta = 5^\circ.8$ *C.* and the latitude $\phi = 39^\circ\ 25'$ *N.*

| | |
|---|---|
| Table 57, with argument 448.6, gives | 6511 meters. |
| Table 57, with argument 1000.3, gives | 104 |
| Approximate value of $Z$ | 6407 meters. |
| Table 61, with arguments 449 and 2.4 gives $\Delta\ \theta = 0.3$ | |
| Table 61, with arguments 1000 and 7.3 gives $\Delta\ \theta = 0.4$ | |
| Table 58, with $\theta = 5^\circ.8 + 0^\circ.7 = 6^\circ.5$, and $Z = 6407$ gives $6407 \times 0.024 =$ | 154 |
| Table 62 with $Z = 6561$ and $\phi = 39^\circ\ 25'$, gives | 19 |
| Table 63 with $Z = 6561$ and $h_0 = 0$, gives | 7 |
| Corrected value of $Z$ | = 6587 meters. |

**Table 64.** *Difference of height corresponding to a change of* 0.1 *inch in the barometer — English measures.*

If we differentiate the barometric formula, page xlii, we shall obtain, neglecting insensible quantities,

$$dZ = -\,26281\,\frac{dB}{B}\left(1 + 0.002039\,(\theta - 32^\circ)\right)(1 + \beta),$$

in which $B$ represents the mean pressure of the air column $dZ$.

Putting $dB = 0.1$ inch,

$$dZ = -\,\frac{2628.1}{B}\left(1 + 0.002039\,(\theta - 32^\circ)\right)(1 + \beta).$$

The second member, taken positively, expresses the height of a column of air in feet corresponding to a tenth of an inch in the barometer under standard gravity. Since the last factor $(1 + \beta)$, as given on page xliii, is a function of the temperature, the function has only two variables and admits of convenient tabulation.

Table 64, containing values of $dZ$ for short intervals of the arguments $B$ and $\theta$, has been taken from the Report of the U.S. Coast Survey, 1881, Appendix 10, — *Barometric hypsometry and reduction of the barometer to sea level*, by Wm. Ferrel.[1]

The temperature argument is given for every 5° from 30° *F.* to 85° *F.*, and the pressure argument for every 0.2 inch from 22.0 to 30.8 inches.

This table may be used in computing small differences of altitude, and, up to a thousand feet or more, very approximate results may be obtained.

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[1] Due to the use of a slightly different value for the coefficient of expansion, Prof. Ferrel's formula, upon which the table is computed, is

$$dZ = -\frac{2628.4}{B}\left(1 + 0.002034\,(\theta - 32^\circ)\right)(1 + \beta).$$

**Example:**

Mean pressure at Augusta, October, 1891, 29.94; temperature, $60^\circ.8$ *F.*
Mean pressure at Atlanta, October, 1891, 28.97; temperature, $59^\circ.4$
Mean pressure of air column $B = 29.455$; $\theta = 60^\circ.1$

Entering the table with 29.455 and $60^\circ.1$ as arguments, we take out 94.95 as the difference of elevation corresponding to a tenth of an inch difference of pressure. Multiplying this value by the number of tenths of inches difference in the observed pressures, viz. 97, we obtain the difference of elevation 921 feet.

TABLE 65.

**Table 65.** *Difference of height corresponding to a change of one millimeter in the barometer — Metric measures.*

This table has been computed by converting Table 64 into metric units. The temperature argument is given for every 2° from $-2^\circ$ *C.* to $+36^\circ$ *C.*; the pressure argument is given for 10-mm. intervals from 760 to 560 mm.

TABLE 66.

**Table 66.** *Babinet's formula for determining heights by the barometer.*

Babinet's formula for computing differences of altitude [1] represents the formula of Laplace quite accurately for differences of altitude up to 1000 meters, and within one per cent for much greater altitudes. As it has been quite widely disseminated among travelers and engineers, and is of convenient application, the formula is here given in English and metric measures. It might seem desirable to alter the figures given by Babinet so as to conform to the newer values of the barometrical constants now adopted; but this change would increase the resulting altitudes by less than one-half of one per cent without enhancing their reliability to a corresponding degree, on account of the outstanding uncertainty of the assumed mean temperature of the air.

The formula is, in English measures,

$$Z \text{ (feet)} = 52494 \left[1 + \frac{t_0 + t - 64^\circ}{900}\right] \frac{B_0 - B}{B_0 + B};$$

and in metric measures,

$$Z \text{ (meters)} = 16000 \left[1 + \frac{2\,(t_0 + t)}{1000}\right] \frac{B_0 - B}{B_0 + B},$$

in which $Z$ is the difference of elevation between a lower and an upper station at which the barometric pressures corrected for all sources of instrumental error are $B_0$ and $B$, and the observed air temperatures are $t_0$ and $t$, respectively.

For ready computation the formula is written

$$Z = C \times \frac{B_0 - B}{B_0 + B},$$

[1] *Comptes Rendus*, Paris, 1850, vol. xxx., page 309.

and the factor $C$, computed both in English and metric measures, has been kindly furnished by the late Prof. Cleveland Abbe. The argument is $\frac{1}{2}(t_0 + t)$ given for every 5° Fahrenheit between 10° and 100° $F.$, and for every 2° Centigrade between − 10° and 36° Centigrade.

In using the table, it should be borne in mind that on account of the uncertainty in the assumed temperature, the last two figures in the value of $C$ are uncertain, and are here given only for the sake of convenience of interpolation. Consequently one should not attach to the resulting altitudes a greater degree of confidence than is warranted by the accuracy of the temperatures and the formula. The table shows that the numerical factor changes by about one per cent of its value for every change of five degrees Fahrenheit in the mean temperature of the stratum of air between the upper and lower stations; therefore the computed difference of altitude will have an uncertainty of one per cent if the assumed temperature of the air is in doubt by 5° $F$. With these precautions the observer may properly estimate the reliability of his altitudes whether computed by Babinet's formula or by more elaborate tables.

**Example:**

Let the barometric pressure observed and corrected for temperature at the upper and lower stations be, respectively, $B = 635$ mm. and $B_0 = 730$ mm. Let the temperatures be, respectively, $t = 15°$ $C.$, $t_0 = 20_0$ $C.$ To find the approximate difference of height.

With $\frac{1}{2}(t_0 + t) = \frac{20° + 15°}{2} = 17°.5$ $C.$, the table in metric measures gives

$C = 17120$ meters. $\frac{B_0 - B}{B_0 + B} = \frac{95}{1365}$.

The approximate difference of height $= 17120 \times \frac{95}{1365} = 1191.5$ meters.

## THERMOMETRICAL MEASUREMENT OF HEIGHTS BY OBSERVATION OF THE TEMPERATURE OF THE BOILING POINT OF WATER.

When water is heated in the open air, the elastic force of its vapor gradually increases, until it becomes equal to the incumbent weight of the atmosphere. Then, the pressure of the atmosphere being overcome, the steam escapes rapidly in large bubbles and the water boils. The temperature at which water boils in the open air thus depends upon the weight of the atmospheric column above it, and under a less barometric pressure the water will boil at a lower temperature than under a greater pressure. Now, as the weight of the atmosphere decreases with the elevation, it is obvious that, in ascending a mountain, the *higher* the station where an observation is made, the *lower* will be the temperature of the boiling point.

The difference of elevation between two places therefore can be deduced from the temperature of boiling water observed at each station. It is only necessary to find the barometric pressures which correspond to those temperatures, and from these to compute the difference of height by the tables given herein for computing heights from barometric observations.

From the above, it may be seen that the heights determined by means of the temperature of boiling water are less reliable than those deduced from barometric observations. Both derive the difference of altitude from the difference of atmospheric pressure. But the temperature of boiling water is a less accurate measurement of the atmospheric pressure than is the height of the barometer. In the present state of thermometry it would hardly be safe, indeed, to rely, in the most favorable circumstances, upon quantities so small as hundredths of a degree, even when the thermometer has been constructed with the utmost care; moreover, the quality of the glass of the instrument, the form and substance of the vessel containing the water, the purity of the water itself, the position at which the bulb of the thermometer is placed, whether in the current of the steam or in the water, — all these circumstances cause no inconsiderable variations to take place in the indications of thermometers observed under the same atmospheric pressure. Owing to these various causes, an observation of the boiling point, differing by one-tenth of a degree from the true temperature, ought to be still admitted as a good one. Now, as the tables show, an error of one-tenth of a degree Centigrade in the temperature of boiling water would cause an error of 2 millimeters in the barometric pressure, or of from 70 to 80 feet in the final result, while with a good barometer the error of pressure will hardly ever exceed one-tenth of a millimeter, making a difference of 3 feet in altitude.

Notwithstanding these imperfections, the hypsometric thermometer is of the greatest utility to travellers and explorers in rough countries, on account of its being more conveniently transported and much less liable to accidents than the mercurial barometer. A suitable form for it, designed by Regnault (*Annales de Chimie et de Physique*, Tome xiv, p. 202), consists of an accurate thermometer with long degrees, subdivided into tenths. For observation the bulb is placed about 2 or 3 centimeters above the surface of the water, in the steam arising from distilled water in a cylindrical vessel, the water being made to boil by a spirit-lamp.

TABLES 67, 68.

*Barometric pressures at standard gravity corresponding to the temperature of boiling water.*

TABLE 67. *English Measures.*

TABLE 68. *Metric Measures.*

Table 67 is copied directly from Table 70. The argument is the temperature of boiling water for every tenth of a degree from 185°.0 to 214°.9 Fahrenheit. The tabular values are given to the nearest 0.001 inch.

Table 68 is copied directly from Table 72. The argument is given for every tenth of a degree from 80°.0 to 100°.9 C. The tabular values are given to the nearest 0.01 mm.

## HYGROMETRICAL TABLES.

### PRESSURE OF SATURATED AQUEOUS VAPOR.

In former editions of these tables the values of aqueous vapor pressures at temperatures between $-29°$ and $100°$ C. were based upon Broch's reduction of the classic observations of Regnault. (*Travaux et Mémoires du Bureau international des Poids et Mesures*, t. I, p. A 19–39). In these computations the same continuous mathematical function was employed to calculate the values of vapor pressure both above and below the point of change of state on freezing. This resulted in a systematic disagreement between observed and computed vapor pressures below the freezing point, and confirmed the inference from the laws of diffusion following from the kinetic theory of gases, namely, that the pressure of the vapor is different according as it is in contact with its liquid or its solid.

Seeking to remove the uncertainty of the values of vapor pressures at temperatures below freezing, Marvin (Annual Report Chief Signal Officer, 1891, Appendix No. 10) made direct experimental determinations thereof, in the course of which the specimens of water were cooled to temperatures of from $-10°$ to $-12°$ C. while still retaining the liquid state, thus affording opportunity for measurements of vapor pressure over ice and over water at various temperatures below the freezing point. The results of these investigations, confirmed by similar independent studies by Juhlin, were printed in the third revised edition of these tables.

Since 1907, especially, several extended series [1] of entirely new determinations, together covering the whole range of temperature from $-70°$ *C.* to $+374°$ *C.*, have been made at the Physikalische-Technischen Reichsanstalt. Because of the elaborate instrumental means available and the extreme effort to eliminate all possible errors these results may be presumed to represent the most accurate series of experimental values of this important physical datum available to science.

Hitherto no satisfactory mathematical equation has been offered adequate to give computed values of vapor pressures with an order of precision comparable to the systematic self consistency of the observations

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[1] Scheel, Karl und Heuse, Wilhelm. Bestimmung des Sättigungsdrucks von Wasserdampf unter 0°. Annalen der Physik, 1909, 29: 723–737.

Bestimmung des Sättigungsdrucks von Wasserdampf zwischen 0° und + 50°. Annalen der Physik, 1910, 31: 715–736.

Holborn, L. und Henning, F. Über das Platinthermometer und den Sättigungsdruck des Wasserdampfes zwischen 50 und 200°. Annalen der Physik, 1908, 26: 833–883.

Holborn, L. und Baumann, A. Über den Sättigungsdruck des Wasserdampfes oberhalb 200°. Annalen der Physik, 1910, 31: 945–970.

themselves. This is particularly the case with the more recent data over the whole range of temperature from 0° to the critical temperature at about 374° Centigrade. Two remedies have been utilized to overcome this difficulty. First, the employment of separate equations of interpolation adjusted to fit the observations accurately over a short range of temperature, 0° to 100° for example, as in the case of Broch's computations. (It has already been mentioned that theory requires the function for vapor pressures over ice to differ from the one for pressures over water, so that the values for ice offer no difficulty.) The second remedy sometimes employed consists in fitting any reasonably accurate equation as closely as possible to the observations. The differences between the observed and computed values are then charted and a smooth curve drawn by hand through the points thus located. This method has been employed notably by Henning[1] and others, using an empirical equation proposed by Thiesen.

For the purpose of these tables Marvin has found it possible from among a multitude of equations to develop a modification of the theoretical equation of Van der Waals which fits the whole range of observations much better than any hitherto offered and with an order of precision quite comparable to the data itself. In fact, the equation serves to disclose inconsistencies in the observations, more particularly between 50° and 80° *C.*, which seem to suggest the need for further experimental determination of values possibly over the range between 0° and 100°.

Although it is not difficult to show, as Cederberg [2] has done, that the simple form of general theoretical equation for all vapors developed by Van der Waals is inadequate to represent experiments on water vapor with sufficient accuracy for practical requirements, nevertheless a somewhat simple elaboration of its single constant suffices to remove this limitation in a very satisfactory manner.

The resulting equation is:

$$\log e = \log \pi - [A - bX + mX^2 - nX^3 + sX^4]\,\frac{\theta - T}{T}, \text{ where } X = \frac{T - 453}{10}. \quad (1)$$

The quantity within the square brackets in this equation replaces a single term of the Van der Waals equation which was regarded by him as a constant.

In Van der Waals's original equation $\pi$ and $\theta$ are respectively the critical pressure and temperature (absolute). In the present state of physical science, and from the very nature of the data, these quantities cannot be evaluated exactly. Moreover it is unnecessary to do so for the mere purpose of accurately fitting a mathematical curve to the observational data,

[1] Annalen der Physik, 1907, 22: 609–630.

[2] Cederberg, Ivar W. Über eine exakte Dampfdruckberechnungsmethode. Physik. Zeitschr. xv: 697, 1914; Über die Temperaturabhängigkeit einiger physikalischen Eigenschaften des Wassers in seinen vershiedenen Aggregatzuständen. Physik. Zeitschr. xv: 824, 1914.

because the same result is attained by simply passing the curve through a point more accurately known and as near as may be to the critical point. This is equivalent to defining $\pi$ and $\theta$ by an "equation of condition." Another "equation of condition" fixes the pressure at the boiling point which by definition must be 760 mm. From the considerations given on page xi computations are greatly facilitated by taking all temperatures on the approximate absolute scale represented by $T = 273 + t°$.

A careful preliminary analysis of the observational data in the vicinity of the critical temperature resulted in assigning values to $\theta$ and $\pi$ as follows:

$$\theta = 643°, \log. \pi = 5.1959000$$

It is emphasized here again that these data do not represent critical temperature conditions, but simply a convenient point on the pressure curve slightly below the critical temperature, the value of which is fixed with considerable accuracy by the observational data.

The value of the constant $A$ was fixed by the equation of condition, $e = 760$ mm. when $T = 373$ ($X = -8$). The remaining constants (b, m, n, s) are computed by the method of least squares. The results are as follows:

$$\begin{aligned} A &= 3.1473172 \\ b &= .00295944 \\ m &= .0004191398 \\ n &= .0000001829924 \\ s &= .00000008243516 \end{aligned}$$

The number of significant figures in the constants is obviously greater than the accuracy of the data justifies; but is justified to facilitate computation and to secure accuracy in the interpolation of values which should themselves be as accurate as the data.

Thiesen[1] has shown that the observed values of vapor pressure over ice can be reproduced by the equation

$$\text{Log } e = \log e_0 + 9.632\ (1 - 0.00035\, t)\ \frac{t}{T}$$

where $e_0 = 4.5785$, and $T = 273 + t$.

For convenience in computing this equation, for metric units it may be written

$$\text{Log } e = 0.66072 + \left(\frac{9.632 - 0.0033712\, t}{273 + t}\right) t. \qquad (2)$$

For English units the equation becomes

$$\text{Log } e = \bar{1}.255888 + \left(\frac{9.69193 - 0.00187289\, t_1}{459.4 + t_1}\right) (t_1 - 32). \qquad (3)$$

$t$ = degrees Centigrade; $t_1$ = degrees Fahrenheit.

[1] Thiesen M. Die Dampfspannung über Eis. (Mitteilung aus der Physikalisch-Technischen Reichsanstalt.) Annalen der Physik, 1909; 29 : 1057.

The vapor pressures in the tables here given are expressed in standard manometric units.

TABLE 69.

**Table 69.** *Pressure of aqueous vapor over ice. English measures.*

The pressures, computed by equation (3) above, are given to 0.00001 inch for each degree of temperature from $-60^\circ$ to $-15^\circ$, for each half degree from $-15$ to $\pm 0^\circ$, and for each tenth of a degree from $\pm 0^\circ.0$ to $+32^\circ.0$.

TABLE 70.

**Table 70.** *Pressure of aqueous vapor over water. English measures.*

This table has been computed by converting Table 72 into English units. The temperature argument is given for every $0^\circ.1$ from $32^\circ.0$ to $214^\circ.9$ *F.* The vapor pressures are to 0.0001 inch from $32^\circ.0$ to $130^\circ.9$, *F.*, and to 0.001 inch from $130^\circ.0$ to $214^\circ.9$ *F.*

TABLE 71.

**Table 71.** *Pressure of aqueous vapor over ice. Metric measures.*

The pressures, computed by equation (2) above, are given to the nearest 0.0001 mm. for each degree of temperature from $-70^\circ$ to $-50^\circ$, for each half degree from $-50^\circ$ to $-35^\circ$, and each tenth of a degree from $-35^\circ.0$ to $\pm 0^\circ.0$.

TABLE 72.

**Table 72.** *Pressure of aqueous vapor over water. Metric measures.*

The pressures, computed by equation (1) above, are given for each tenth of a degree to 0.001 mm. from $0^\circ.0$ to $50^\circ.9$, and to $0^\circ.01$ mm. from $50^\circ.0$ to $100^\circ.9$. They are given for each degree to 0.1 mm. from $100^\circ$ to $189^\circ$, and in millimeters from $190^\circ$ to $374^\circ$.

TABLES 73, 74.

**Table 73.** *Weight of cubic foot of saturated aqueous vapor — English measures.*

**Table 74.** *Weight of a cubic meter of saturated aqueous vapor — Metric measures.*

For many years it has been customary to assume that the specific gravity of water vapor relative to dry air is a constant whose theoretical value computed from the accurately known densities of its constituent gases is 0.6221. Direct experimental determinations of the specific volume of dry saturated steam (as yet but few observations are available at moderate temperatures) show conclusively (1) that this theoretical specific gravity is true only for saturated vapor at very low temperatures or when the vapor is in a very attenuated state of partial saturation; (2) that at increasingly higher temperatures the specific gravity is increasingly greater than 0.6221. These assertions are in accord with the values of weight per cubic foot of water vapor tabulated by Marks & Davis [1] from the most recent determinations of the specific volume of water vapor. However, owing to the paucity of data, and its inaccuracy for the range of atmospheric temperatures and conditions, the values derived from densities given by Marks and Davis between 10° and 50° are probably too low and require revision. The basis on which this assertion is made is the generalization that the theoretical value 0.6221 is probably a minimum specific gravity towards which actual values asymptotically tend at low temperature and low relative humidity in the meteorological sense, or high super heats in the steam engineering sense. This generalization affords a very helpful "control" in harmonizing and combining experimental determinations of specific volume. It was thus employed in a recomputation, from the original experimental data on specific volumes, of the accompanying table of specific gravities, $\delta$, of saturated water vapor.

| *T.* (*C*°) | $\delta$ | *T.* (*C*°) | $\delta$ |
|---|---|---|---|
| − 60 | 0.6226 | 60 | 0.6273 |
| 50 | 0.6227 | 70 | 0.6283 |
| 40 | 0.6229 | 80 | 0.6296 |
| 30 | 0.6230 | 90 | 0.6311 |
| 20 | 0.6232 | 100 | 0.6329 |
| − 10 | 0.6235 | 110 | 0.6351 |
| ± 0 | 0.6238 | 120 | 0.6377 |
| + 10 | 0.6241 | 130 | 0.6408 |
| 20 | 0.6246 | 140 | 0.6446 |
| 30 | 0.6251 | 150 | 0.6491 |
| 40 | 0.6257 | 160 | 0.6545 |
| 50 | 0.6264 | 170 | 0.6609 |
| | | 180 | 0.6687 |

The weight of a *cubic meter* of saturated vapor is given by the expression

$$W = \frac{a\delta}{1 + \alpha t} \cdot \frac{e}{760},$$

$a$ is the weight of a cubic meter of dry air (free from carbonic acid) at temperature 0° *C.*, and pressure of 760 millimeters of mercury of standard density under standard gravity: $a = 1.29278$ kg. (Bureau International des Poids et Mesures: *Travaux et Mémoires*, t. I, p. A 54.)

$\delta$ is the density of aqueous vapor relative to dry air: $\delta = 0.6221$.

While, as stated above, there is reason for believing that this value is too low, for atmospheric temperatures the error is less than one per cent. For practical work in meteorology and at moderate temperatures, it seems best to retain the theoretical value until the actual value has been determined

[1] Marks, Lionel S., and Davis, Harvey N. Tables and diagrams of the thermal properties of saturated and superheated steam. New York, 1909.

with greater accuracy. For all important calculations except those at low temperatures the values of $\delta$ in the Table on page lvi should be employed.

$e$ is the pressure of saturated aqueous vapor at temperature $t$, taken from Tables 71 and 72.

$\alpha$ is the coefficient of expansion of air for 1° $C.$: $\alpha = 0.003670$.

$t$ is the temperature in Centigrade degrees.

Whence we have

$$W\,(\text{grams}) = 1.05821 \times \frac{e}{1 + 0.003670\,t}.$$

**Table 74** is computed from this formula and gives the weight of saturated vapor in grams in a cubic meter for dew-points from $-29°$ to $+40.°9$ $C.$, the intervals from 6° to $40.°9$ $C.$, being $0.°1$ $C.$ The tabular values are given to three decimals.

The weight $W_1$ of a *cubic foot* of saturated vapor is obtained by converting the foregoing constants into English measures.

The weight of a cubic foot of dry air at temperature 32° $F.$ and at a pressure of 760 mm. or 29.921 inches is

$$a_1\,(\text{grains}) = \frac{1292.78 \times 15.43235}{(3.280833)^3} = 564.94.$$

We have therefore,

$$W_1\,(\text{grains}) = \frac{a_1\delta}{29.921} \times \frac{e_1}{1 + \alpha_1\,(t_1 - 32°)} = 11.7459\,\frac{e_1}{1 + 0.002039\,(t_1 - 32°)}$$

The temperature $t_1$ is expressed in degrees Fahrenheit; the vapor pressure $e_1$, expressed in inches, is obtained from Tables 69 and 70.

**Table 73** gives the weight of saturated aqueous vapor in grains per cubic foot for dew points given to every degree from $-30°$ to $+20°$, to each half degree from $+20°$ to $+70°$, and for every $0.°2$ from $70.°0$ to $119.°8$ F, the values being computed to the thousandth of a grain.

## REDUCTION OF OBSERVATIONS WITH THE PSYCHROMETER AND DETERMINATION OF RELATIVE HUMIDITY.

The psychrometric formula derived by Maxwell, Stefan, August, Regnault and others is, in its simplest form,

$$e = e' - AB\,(t - t'),$$

in which $t$ = Air temperature.

$t'$ = Temperature of the wet-bulb thermometer.

$e$ = Pressure of aqueous vapor in the air.

$e'$ = Vapor pressure, saturated, at temperature $t'$.

$B$ = Barometric pressure.

$A$ = A quantity which, for the same instrument and for certain conditions, is a constant, or a function depending in a small measure on $t'$.

All pressures are expressed in heights of mercurial column under standard gravity.

The important advance made since the time of Regnault consists in recognizing that the value of $A$ differs materially according to whether the wet-bulb is in quiet or moving air. This was experimentally demonstrated by the distinguished Italian physicist, Belli, in 1830, and was well known to Espy, who always used a whirled psychrometer. The latter describes his practice as follows: "When experimenting to ascertain the dew-point by means of the wet-bulb, I always swung both thermometers moderately in the air, having first ascertained that a moderate movement produced the same depression as a rapid one."

The principles and methods of these two pioneers in accurate psychrometry have now come to be adopted in the standard practice of meteorologists, and psychrometric tables are adapted to the use of a whirled or ventilated instrument.

The factor $A$ depends in theory upon the size and shape of the thermometer bulb, largeness of stem and velocity of ventilation, and different formulæ and tables would accordingly be required for different instruments. But by using a ventilating velocity of three meters or more per second, the differences in the results given by different instruments vanish, and the same tables can be adapted to any kind of a thermometer and to all changes of velocity above that which gives sensibly the greatest depression of the wet-bulb temperature; and with this arrangement there is no necessity to measure or estimate the velocity in each case further than to be certain that it does not fall below the assigned limit.

The formula and tables here given for obtaining the vapor pressure and dew-point from observations of the whirled or ventilated psychrometer are those deduced by Prof. Wm. Ferrel (*Annual Report Chief Signal Officer*, 1886, Appendix 24) from a discussion of a large number of observations.

Taking the psychrometric formula in metric units, pressures being expressed in millimeters and temperatures in centigrade degrees, Prof. Ferrel derived for $A$ the value

$$A = 0.000656\,(1 + 0.0019\,t').$$

In this expression for $A$, the factor depending on $t'$ arises from a similar term in the expression for the latent heat of water, and the theoretical value of the coefficient of $t'$ is 0.00115. Since it would require a very small change in the method of observing to cause the difference between the theoretical value and that obtained from the experiments, Prof. Ferrel adopted the theoretical coefficient 0.00115 and then recomputed the observations, obtaining therefrom the final value

$$A = 0.000660\,(1 + 0.00115\,t').$$

With this value the psychrometric formula in metric measures becomes

$$e = e' - 0.000660\, B\, (t - t')\, (1 + 0.00115\, t').$$

Expressed in English measures, the formula is

$$e = e' - 0.000367\, B\, (t - t')\, [1 + 0.00064\, (t' - 32^\circ)]$$

$$= e' - 0.000367\, B\, (t - t') \left(1 + \frac{t' - 32}{1571}\right)$$

in which $e$ = Vapor pressure in inches.
$e'$ = Pressure of saturated aqueous vapor at temperature $t'$.
$t$ = Temperature of the air in Fahrenheit degrees.
$t'$ = Temperature of the wet-bulb thermometer in Fahrenheit degrees.
$B$ = Barometric pressure in inches.



**Table 75.** *Reduction of Psychrometric Observations — English measures.*

$$\textit{Values of } e = e' - 0.000367\, B\, (t - t') \left(1 + \frac{t' - 32}{1571}\right)$$

This table provides for computing the vapor pressure, $e$, from observations of ventilated wet- and dry-bulb Fahrenheit thermometers. From the vapor pressure thus computed the dew-point and relative humidity of the atmosphere may be obtained.

The tabular values of the vapor pressure, $e$, are computed for degree intervals of $t'$ from $-20^\circ$ to $+110^\circ$ $F$. Below $+10^\circ$ the interval for $t - t'$ is $0^\circ.2$, and above $10^\circ$ the interval is $1^\circ$. The computation has been made for $B = 30.0$ inches, but at the bottom, and usually, also, at the top of each page of the table is given a correction, $\Delta e \times \Delta B$, computed for $B = 29.0$ inches or $\Delta B = 1$ inch, and for the value of $t'$ indicated. The correction is a linear function of $\Delta B$. For atmospheric pressures less than 30.0 inches, it is to be added to the tabular values of $e$, while for atmospheric pressures greater than 30.0 inches it is to be subtracted.

The values of $e$ are given to 0.0001 inch for $t'$ less than $10^\circ$, and to 0.001 inch for $t'$ greater than $10^\circ$.

**Examples:**

1. Given, $t = 84^\circ.3$; $t' = 66^\circ.7$, and $B = 30.00$ inches. With $t' = 66^\circ.7$ and $t - t' = 17^\circ.6$ as arguments, Table 75 gives for $e$ the value 0.462 inch. On page 174, for $t - t' = 0^\circ.0$ it is seen that a vapor presure of 0.462 inch corresponds to a temperature $t' = t = 57^\circ$, which is the saturation, or dew-point temperature for the data given.
2. Given, $t = 34^\circ.5$; $t' = 29^\circ.4$; $B = 22.3$ inches. With $t' = 29^\circ.4$ and $t - t' = 5^\circ.1$ as arguments, Table 75 gives for $e$ the value 0.104.
   $\Delta B = 30.0 - 22.3 = 7.7$, and $\Delta e \times \Delta B = 0.0018 \times 7.7 = 0.014$.
   Correct value of $e$ $= 0.118$ inch

For $t - t' = 0^\circ\!.0$ a vapor pressure of 0.118 inch corresponds to a temperature $t' = t = 23^\circ$ (see page 174), which is the saturation or dew-point temperature for the data given.

**Table 76.** *Relative humidity — Temperature Fahrenheit.*

The table gives the vapor pressure corresponding to air temperatures from $-30^\circ$ to $+120^\circ$ at degree intervals (side argument) and for percentages of saturation at 10 per cent intervals (top argument). It is computed from the formula

$$e = e_s \times \text{relative humidity},$$

where $e_s$ is the saturation vapor pressure at the given air temperature. Below a temperature of $20^\circ$ the values of $e$ are given to 0.0001 inch; above $20^\circ$ they are given to 0.001 inch.

Examples:

1. In dew-point example 1, above, the computed vapor pressure is 0.462 inch. Entering Table 76 with air temperature $84^\circ\!.3$ as side argument, we obtain vapor pressure

| | | | |
|---|---|---|---|
| 0.356 inch | = relative humidity | | 30 |
| and | | | |
| 0.462 inch − 0.356 inch = 0.106 inch | = " " | $\frac{90}{10}$ = | 9 |
| therefore, vapor pressure | | | — |
| 0.462 inch with $t = 84^\circ\!.3$ *F.* | = " " | | 39 |

2. In dew-point example 2, above, the computed vapor pressure is 0.118 inch. Entering Table 76 with air temperature $34^\circ\!.5$ as side argument, we obtain, vapor pressure

| | | | |
|---|---|---|---|
| 0.100 inch | = relative humidity | | 50 |
| and | | | |
| 0.118 inch − 0.100 inch = 0.018 inch | = " " | $\frac{90}{10}$ = | 9 |
| therefore, vapor pressure | | | — |
| 0.118 inch with $t = 34.5$ *F.* | = " " | | 59 |

*Reduction of Psychrometric Observations — Metric measures.*

**Table 77.** *Values of* $e = e' - 0.000660\, B\, (t - t')\, (1 + 0.00115\, t')$

This table provides for computing the vapor pressure from observations of ventilated wet- and dry-bulb Centigrade thermometers. From the vapor pressure thus computed the dew-point and relative humidity of the atmosphere may be obtained.

The tabular values of the vapor pressure, $e$, are computed for degree intervals of $t'$ from $-30^\circ$ to $+45^\circ$ *C.* Below $-5^\circ\!.0$ the interval for $t - t'$

is $0°.1$, and above $-5°.0$ the interval is $1°$. The computation has been made for $B = 760$ mm. but on each page of the table is given a correction, $\Delta e \times \Delta B$, computed for $B = 660$, or $\Delta P = 100$ mm., and for the values of $t'$ indicated. The correction is a linear function of $\Delta B$. For atmospheric pressures less than 760 mm. it is to be added to the tabular values of $e$, while for atmospheric pressures greater than 760 mm. it is to be subtracted. The values of $e$ are given to 0.001 mm. for $t'$ less than $-5°.0$, and to 0.01 mm. for $t'$ greater than $-5°.0$.

**Example:**

Given, $t = 10°.4$ *C.*; $t' = 8°.3$ *C.*, and $B = 740$ mm. With $t' = 8°.3$ and $t - t' = 2°.1$ as arguments, Table 77 gives for $e$ the value 7.15 mm.

$\Delta B = \dfrac{760 - 740}{100} = 0.2.$ $\Delta e \times \Delta B = 0.14 \times 0.2 \qquad = 0.03.$

Corrected value of $e \qquad = 7.18$ mm.

For $t - t' = 0$ a vapor pressure of 7.18 mm. corresponds to a temperature $t' = t = 6°.3$ *C.*, which is the saturation, or dew-point temperature for the data given.



**Table 78.** *Relative humidity — Temperature Centigrade.*

This table gives the vapor pressure corresponding to air temperatures from $-45°$ *C.* to $+55°$ *C.* at degree intervals (side argument) and for percentage of saturation at 10 per cent intervals (top argument). It is computed from the same formula as Table 76, namely,

$$e = e_s \times \text{relative humidity}.$$

Below a temperature of $+5°.0$ the values of $e$ are given to 0.01 mm.; above $5°.0$ they are given to 0.1 mm.

**Example:**

In the dew-point example given above, the computed vapor pressure is 7.18 mm. Entering Table 78 with air temperature 10.4 as side argument, we obtain vapor pressure

6.6 mm. = relative humidity 70

and

$7.18 - 6.6 = 0.58$ mm. = " " $\frac{60}{10} = 6$

therefore, vapor pressure

7.18 mm. with $t = 10.4$ *C.* = " " $= 76$



**Table 79.** *Rate of decrease of vapor pressure with altitude for mountain stations.*

From hygrometric observations made at various mountain stations on the Himalayas, Mount Ararat, Teneriffe, and the Alps, Dr. J. Hann (*Lehrbuch der Meteorologie Dritte Auflage*, S. 230) has deduced the following empirical formula showing the average relation between the vapor pressure $e_0$ at a lower station and $e$ the vapor pressure at another station at an altitude $h$ meters above it:

$$\frac{e}{e_0} = 10^{-\frac{h}{6300}}.$$

This is of course an average relation for all times and places from which the actual rate of decrease of vapor pressure in any individual case may widely differ.

Table 79 gives the values of the ratio $\frac{e}{e_0}$ for values of $h$ from 200 to 6000 meters. An additional column gives the equivalent values of $h$ in feet.

## REDUCTION OF SNOWFALL MEASUREMENT.

The determination of the water equivalent of snowfall has usually been made by one of two methods: (*a*) by dividing the depth of snow by an arbitrary factor ranging from 8 to 16 for snow of different degrees of compactness; (*b*) by melting the snow and measuring the depth of the resulting water. The first of these methods has always been recognized as incapable of giving reliable results, and the second, although much more accurate, is still open to objection. After extended experience in the trial of both these methods, it has been found that the most accurate and most convenient measurement is that of weighing the collected snow, and then converting the weight into depth in inches. The method is equally applicable whether the snow as it falls is caught in the gage, or a section of the fallen snow is taken by collecting it in an inverted gage.

**Table 80.** *Depth of water corresponding to the weight of a cylindrical snow core, 2.655 inches in diameter.*

This table is prepared for convenience in making surveys of the snow layer on the ground, particularly in the western mountain sections of the country. The weighing method is the only one found to be practicable. Present Weather Bureau practice is to take out a sample by means of a special tube, whose diameter, 2.655 inches, has been selected by reason of convenience in manipulation and simplicity in relation to the pound. Table 80 gives the depth of water in inches and hundredths corresponding to given weights. The argument is given in hundredths of a pound from 0.01 pound to 2.99 pounds.

**Table 81.** *Depth of water corresponding to the weight of snow (or rain) collected in an 8-inch gage.*

The table gives the depth to hundredths of an inch, corresponding to the weight of snow or rain collected in a gage having a circular collecting mouth 8 inches in diameter — this being the standard size of gage used throughout the United States.

The argument is given in hundredths of a pound from 0.01 pound to 0.99 pound. When the weight of the collected snow or rain is one pound or more, the depth corresponding to even pounds may be obtained from the equivalent of one pound given in the heading of the table.

Example:

The weight of the snow collected in a gage having a circular collecting mouth 8 inches in diameter is 3.48 pounds. Find the corresponding depth of water.

| | |
|---|---|
| A weight of 3 lbs. corresponds to a depth of water of $0.5507 \times 3$, equals | 1.65 in. |
| A weight of 0.48 lbs. corresponds to a depth of water of | 0.26 |
| A " " 3.48 " " " " " | 1.91 in. |

**Table 82.** *Quantity of rainfall corresponding to given depths.* **Table 82.**

This table gives for different depths of rainfall in inches over an acre the total quantity of water expressed in cubic inches, cubic feet, gallons, and tons. (See Henry, A. J. "Quantity of Rainfall corresponding to Given Depths." *Monthly Weather Review*, 1898, **26**: 408–09.)

## GEODETICAL TABLES.

**Table 83.** *Value of apparent gravity on the earth at sea level.*[1] **Table 83.**

The value of apparent gravity on the earth at sea level is given for every twenty minutes of latitude from 5° to 86°, and for degree intervals near the equator and the poles. It is computed to 0.001 dyne from the equation [2]

$$g_\phi = 978.039\,(1 + 0.005294 \sin^2\phi - 0.000007 \sin^2 2\phi)$$
$$= 980.621\,(1 - 0.002640 \cos 2\phi + 0.000007 \cos^2 2\phi)$$

in which $g_\phi$ is the value of the gravity at latitude $\phi$.

The second form of the equation is the more convenient for the computation.

**Table 84.** *Relative acceleration of gravity at sea level at different latitudes.* **Table 84.**

The formula adopted for the variation with latitude of apparent gravity at sea level is that of the U.S. Coast and Geodetic Survey, given above.

The table gives the values of the ratio $\frac{g_\phi}{g_{45°}}$ to six decimals for every 10′ of latitude from the equator to the pole.

[1] Gravity is here considered in terms of force (expressed in dynes) that is exerted on a mass of one gram rather than its numerical equivalent, acceleration (expressed in centimeters and seconds), for which there is no convenient expression.

[2] See Bowie, William, *Investigations of Gravity and Isostasy.* U.S. Coast and Geodetic Survey, Special Publication No. 40, 1917, page 134.

## LENGTH OF A DEGREE OF THE MERIDIAN AND OF ANY PARALLEL.

The dimensions of the earth used in computing lengths of the meridian and of parallels of latitude are those of Clarke's spheroid of 1866.[1] This spheroid undoubtedly represents very closely the true size and shape of the earth, and is the one to which nearly all geodetic work in the United States is now referred.

The values of the constants are as follows:

$a$, semi-major axis = 20926062 feet; $\log a = 7.3206875$.
$b$, semi-minor axis = 20855121 feet; $\log b = 7.3192127$.

$$e^2 = \frac{a^2 - b^2}{a^2} = 0.00676866\,; \qquad \log e^2 = 7.8305030 - 10.$$

With these values for the figure of the earth, the formula for computing any portion of a quadrant of the meridian is

$$\begin{aligned}\text{Meridional distance in feet} &= [5.5618284]\ \Delta\phi\ \text{(in degrees)},\\ &- [5.0269880] \cos 2\phi \sin \Delta\phi,\\ &+ [2.0528] \cos 4\phi \sin 2\Delta\phi,\end{aligned}$$

in which $2\phi = \phi_2 + \phi_1$, $\Delta\phi = \phi_2 - \phi_1$; $\phi_1$, $\phi_2$ = end latitudes of arc.

For the length of 1 degree, the formula becomes:

$$1 \text{ degree of the meridian, in feet} = 364609.9 - 1857.1 \cos 2\phi + 3.94 \cos 4\phi.$$

The length of the parallel is given by the equation

$$1 \text{ degree of the parallel at latitude } \phi, \text{ in feet} = 365538.48 \cos\phi - 310.17 \cos 3\phi + 0.39 \cos 5\phi.$$

**Table 85.** *Length of one degree of the meridian at different latitudes.*

This gives for every degree of latitude the length of one degree of the meridian in statute miles to three decimals, in meters to one decimal, and in geographic miles to three decimals — the geographic mile being here defined to be one minute of arc on the equator. The values in meters are computed from the relation: 1 meter = 39.3700 inches. The tabular values represent the length of an arc of one degree, the middle of which is situated at the corresponding latitude. For example, the length of an arc of one degree of the meridian, whose end latitudes are 29° 30′ and 30° 30′, is 68.879 statute miles.

**Table 86.** *Length of one degree of the parallel at different latitudes.*

This table is similar to Table 85.

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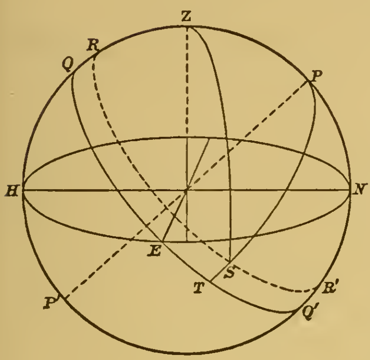
[1] *Comparisons of Standards of Length*, made at the Ordnance Survey Office, Southampton, England, by Capt. A. R. Clarke, R. E., 1866.

**TABLE 87.** *Duration of sunshine at different latitudes for different values of the sun's declination.*




Let $Z$ be the zenith, and $NH$ the horizon of a place in the northern hemisphere.

$P$ the pole;

$QEQ'$ the celestial equator;

$RR'$ the parallel described by the sun on any given day;

$S$ the position of the sun when its upper limb appears on the horizon;

$PN$ the latitude of the place, $\phi$.

$ST$ the sun's declination, $\delta$.

$PS$ the sun's polar distance, $90° - \delta$.

$ZS$ the sun's zenith distance, $z$.

$ZPS$ the hour angle of the sun from meridian, $t$.

$r$ the mean horizontal refraction = 34′ approximately.

$s$ the mean solar semi-diameter = 16′ "

$$z = 90° + r + s = 90°\ 50'$$

In the spherical traingle $ZPS$, the hour angle $ZPS$ may be computed from the values of the three known sides by the formula

$$\sin \tfrac{1}{2}\, ZPS = \sqrt{\frac{\sin \frac{1}{2}\,(ZS + PZ - PS)\, \sin \frac{1}{2}\,(ZS + PS - PZ)}{\sin PZ \sin PS}}$$

or

$$\sin \tfrac{1}{2}\, t = \sqrt{\frac{\sin \frac{1}{2}\,(z + \delta - \phi)\, \sin \frac{1}{2}\,(z - \delta + \phi)}{\cos \phi \cos \delta}}$$

The hour angle $t$, converted into mean solar time and multiplied by 2 is the duration of sunshine.

Table 87 has been computed for this volume by Prof. Wm. Libbey, Jr. It is a table of double entry with arguments $\delta$ and $\phi$. For north latitudes northerly declination is considered positive and southerly declination as negative. The table may be used for south latitudes by considering southerly declination as positive and northerly declination as negative.

The top argument is the latitude, given for every 5° from 0° to 40°, for every 2° from 40° to 60°, and for every degree from 60° to 80°.

The side argument is the sun's declination for every 20′ from $S$ 23° 27′ to $N$ 23° 27′.

The duration of sunshine is given in hours and minutes.

To find the duration of sunshine for a given day at a place whose latitude is known, find the declination of the sun at mean noon for that day in the *Nautical Almanac*, and enter the table with the latitude and declination as arguments.

Example:

To find the duration of sunshine, May 18, 1892, in latitude 49° 30′ North.

From the Nautical Almanac, $\delta = 19° 43' N$.

From the table, with $\delta = 19° 43' N$ and $\phi = 49° 30'$, the duration of sunshine is found to be $15^h 31^m$.

**Table 88.** *Declination of the sun for the year* 1899.

This table is an auxiliary to Table 87, and gives the declination of the sun for every third day of the year 1899. These declinations may be used as approximate values for the corresponding dates of other years when the exact declination cannot readily be obtained. Thus, in the preceding example, the declination for May 18, 1892, may be taken as approximately the same as that for the same date in 1899, viz. 19° 37′.

## THE DURATION OF TWILIGHT.

A review of the literature [1] indicates that from an early date *astronomical* twilight has been considered to end in the evening and begin in the morning when the true position of the sun's center is 18° below the horizon. At this time stars of the sixth magnitude are visible near the zenith, and generally there is no trace on the horizon of the twilight glow.

It also appears that *civil* twilight ends in the evening and begins in the morning when the true position of the sun's center is 6° below the horizon. At this time stars and planets of the first magnitude are just visible. In the evening the first purple light has just disappeared, and darkness compels the suspension of outdoor work unless artificial lighting is provided. In the morning the first purple light is beginning to be visible, and the illumination is sufficient for the resumption of outdoor occupations.

Some confusion has arisen in the computation of tables of the duration of both astronomical and civil twilight, due to the fact that in some instances the time of sunrise or sunset has been considered to be that instant when the *center* of the sun is on the true horizon; in others, when its center *appears* to be on the true horizon; and in still others when the *upper limb* of the sun appears to coincide with the true horizon. In the United States this latter is regarded as defining the time of sunrise and sunset.

In the tables here presented the duration of astronomical twilight is the interval between sunrise or sunset, according to this latter definition, and the instant the true position of the sun's center is 18° below the horizon. Likewise, the duration of civil twilight is the interval from sunrise or sunset to the instant the true position of the sun's center is 6° below the horizon.

[1] Kimball, Herbert H. "Duration and Intensity of Twilight," *Monthly Weather Review*, 1916, 44: 614–620.

The computations may be made from the equation

$$\cos t = \frac{\sin a - \sin \phi \sin \delta}{\cos \phi \cos \delta}$$

where $t$ is the sun's hour angle from the meridian, $a$ is the sun's altitude, considered minus below the horizon, $\delta$ is the solar declination, and $\phi$ is the latitude of the place of observation.

The solar declinations employed are those given in the *American Ephemeris and Nautical Almanac*, 1899, pp. 377–384, Solar Ephemeris for Washington.

The atmospheric refraction with the sun on the horizon has been assumed to be 34′, and 16′ has been allowed for the sun's semi-diameter, so that at the instant of sunrise or sunset, as defined above, the true position of the sun's center is about 50′ below the horizon. The difference between this value of $t$ and its value with the sun 6° and 18° below the horizon gives, respectively, the duration of civil and astronomical twilight.

The computations have been simplified by the use of Ball's Altitude Tables,[1] from which the value of $t$ has been determined for true altitudes of the sun of − 50′, − 6°, and − 18°.

**Table 89.** *Duration of astronomical twilight.* **TABLE 89.**

The duration of astronomical twilight is given to the nearest minute for the 1st, 11th, and 21st day of each month for north latitudes, 0°, 10°, 20°, 25°, and at 2° intervals from 30° to 50°, inclusive. The absence of data for latitude 50° from June 1 to July 11, inclusive, indicates that between these dates at this latitude astronomical twilight continues throughout the night.

**Table 90.** *Duration of civil twilight.* **TABLE 90.**

The duration of civil twilight is given to the nearest minute for the 1st, 11th and 21st day of each month for north latitudes 0°, 10°, 20°, 25°, and at 2° intervals from 30° to 50°, inclusive.

## RELATIVE INTENSITY OF SOLAR RADIATION AT DIFFERENT LATITUDES.

**TABLE 91.**

**Table 91.** *Mean intensity for 24 hours of solar radiation on a horizontal surface at the top of the atmosphere.*

This table is that of Prof. Wm. Ferrel, published in the *Annual Report of the Chief Signal Officer*, 1885, Part 2, p. 427, and computed from formulæ and constants given in Chapter II of the above publication, pages 75 to 82. It gives the mean intensity, $J$, for 24 hours of solar radiation received by a horizontal surface at the top of the atmosphere, in terms of the mean solar

[1] Ball, Frederick. *Altitude Tables for lat. 31° to 60°*. London, 1907; [same] for lat. 0° to 30°, London, 1910.

constant $A_0$, for each tenth parallel of latitude of the northern hemisphere, and for the first and sixteenth day of each month; also the values of the solar constant $A$ in terms of $A_0$, and the longitude of the sun for the given dates.

**Table 92.** *Relative amounts of solar radiation received on a horizontal surface during the year at different latitudes.*

The second column of this table is obtained from the last line of Table 91 by multiplying by 1440, the number of minutes in 24 hours. It therefore gives the average daily amount of radiation that would be received from the sun on a horizontal surface at the surface of the earth if none were absorbed or scattered by the atmosphere, expressed in terms of the mean solar constant. The following columns give similar data, except that the atmospheric transmission coefficient is assumed to be 0.9, 0.8, 0.7 and 0.6, respectively, and have been computed by utilizing Angot's work (*Recherches théoretiques sur la distribution de la chaleur à la surface du globe*, par M. Alfred Angot, *Annales du Bureau Central Météorologique de France*, Année 1883. v. 1. B 121–B 169), which leads to practically the same values as Ferrel's when expressed in the same units.

The vertical argument of the table is for 10° intervals of latitude from the equator to the north pole, inclusive.

**Table 93.** *Air mass, m, corresponding to different zenith distances of the sun.*

For homogenous rays, the intensity of solar energy after passing through an air mass, $m$, is expressed by the equation $I = I_0 a^m$, where $I_0$ is the intensity before absorption, $a$ is the atmospheric transmission coefficient, or the proportion of the energy transmitted by unit air mass, and $m$ is the air mass passed through. If we take for unit air mass the atmospheric mass passed through by the rays when the sun is in the zenith, then for zenith distances of the sun less than 80° the air mass is nearly proportional to the secant of the sun's zenith distance. In general, the secant gives air masses that are too high by an increasing amount as the zenith distance of the sun increases.

The equation by which air masses are sometimes computed is

$$m = \frac{\textit{atmospheric refraction}}{K \sin Z}$$

where $Z$ is the sun's zenith distance and $K$ is a constant. The uncertain factor in this equation is the atmospheric refraction. Table 93 gives values of $m$ computed by Bemporad (*Rend. Acc. Lincei.*, Roma, Ser. 5, V. 16, 2 Sem. 1907, pp. 66–71) from the above formula, using for $K$ the value 58''.36. The argument is for each degree of $Z$ from 20° to 89°, with values of $m$ added for $Z$ = 0°, 10°, and 15°. The values of $m$ are given to two decimal places.

**TABLE 94.** *Relative illumination intensities.* **TABLE 94.**

The table gives illumination intensities in foot-candles for zenithal sun, sky at sunset, sky at end of civil twilight, zenithal full moon, quarter moon, and starlight, and the ratio of these intensities to the illumination from the zenithal full moon. For the sources of the data see Kimball, Herbert H., "Duration and Intensity of Twilight," *Monthly Weather Review*, 1916, 44: 614–620.

## MISCELLANEOUS TABLES.

### WEIGHT IN GRAMS OF A CUBIC CENTIMETER OF AIR.

The following tables (95 to 100) give the factors for computing the weight of a cubic centimeter of air at different temperatures, humidities and pressures.

$$\delta = \frac{0.00129305}{1 + 0.00367\,t}\left(\frac{B - 0.378\,e}{760}\right)$$

in which $\delta$ is the weight of a cubic centimeter of air expressed in grams, under the standard value of gravity ($g = 980.665$)

$B$ is the atmospheric pressure in millimeters, under standard gravity;

$e$ is the pressure of aqueous vapor in millimeters, under standard gravity;

$t$ is the temperature in Centigrade degrees.

For dry atmospheric air (containing 0.0004 of its weight of carbonic acid) at a pressure of 760 mm. and temperature 0° *C.*, the absolute density, or the weight of one cubic centimeter, is 0.00129305 gram. (International Bureau of Weights and Measures. *Travaux et Mémoires, t.* I, p. A 54.) See also these Tables, p. xli.

The weight of a cubic centimeter may also be written as follows:

$$\delta = \frac{0.00129305}{1 + 0.0020389\,(t - 32^\circ)}\left(\frac{B - 0.378\,e}{29.921}\right)$$

where $\delta$ is defined as before, but $B$ and $e$ are expressed in inches and $t$ in Fahrenheit degrees. Thus by the use of tables based on these two formulæ, lines of equal atmospheric density may be drawn for the whole world, no matter whether the original observations are in English or metric measures.

ENGLISH MEASURES. **TABLES 95, 96, 97.**

**TABLE 95.** *Temperature Term.*

This table gives the values and logarithms of the expression

$$\delta_{t,\,29.921} = \frac{0.00129305}{1 + 0.0020389\,(t - 32^\circ)}$$

for values of $t$ extending from $-45^\circ$ *F.* to $+140^\circ$ *F.*, the intervals between 0° *F.* and 110° *F.* being 1°.

The tabular values are given to five significant figures.

**Table 96.** *Term for humidity; auxiliary to Table* 95.

**Table 97.** *Humidity and pressure term.* $\dfrac{h}{29.921} = \dfrac{B - 0.378\,e}{29.921}$.

**Table 96** gives values of $0.378\,e$ to three decimal places as an aid to the use of Table 97. The argument is the dew-point given for every degree from $-60°\,F.$ to $+140°\,F.$ The second column gives the corresponding values of the vapor pressure ($e$) derived from Tables 69 and 70.

**Table 97** gives values and logarithms of $\dfrac{h}{29.921} = \dfrac{B - 0.378\,e}{29.921}$ for values of $h$ extending from 10.0 to 31.7 inches. The logarithms are given to five significant figures and the corresponding numbers to four decimals.

**Example:**

The air temperature is 68° $F.$, the pressure is 29.36 inches and the dew-point 51° $F.$ Find the logarithm of the density.

| | |
|---|---|
| Table 95, for $t = 68°\,F.$, gives | 7.08085 − 10 |
| Table 96, for dew-point 51°, gives $0.378\,e = 0.142$ inch, | |
| Table 97, for $h = B - 0.378\,e = 29.36 - 0.14 = 29.22$, gives | 9.98941 − 10 |
| | 30 |
| Logarithm of density = | 7.07056 − 10 |

## METRIC MEASURES.

**Table 98.** *Temperature term.*

This table gives values and logarithms of the expression

$$\delta_{t,\,760} = \frac{0.00129305}{1 + 0.00367\,t}$$

for values of $t$ extending from $-34°\,C.$ to $+69°\,C.$ The tabular values are given to five significant figures.

**Table 99.** *Term for humidity; auxiliary to Table* 100.

**Table 100.** *Humidity and pressure terms.* $\dfrac{h}{760} = \dfrac{B - 0.378\,e}{760}$.

Table 99 gives the values of $0.378\,e$ to hundredths of a millimeter for dew-points extending from $-50°\,C.$ to $+60°\,C.$ Above $-25°\,C.$ the interval is one degree. The values of the vapor pressure, $e$, corresponding to these dew-points, given in the second column, are taken from tables 71 and 72.

Table 100 gives values and logarithms of $\dfrac{h}{760} = \dfrac{B - 0.378\,e}{760}$ for values of $h$ extending from 300 to 799 mm. The atmospheric pressure $B$ is the barometer reading corrected for gravity and $0.378\,e$ is the term for humidity obtained from Table 99. The logarithms are given to five significant figures and the corresponding numbers to four decimal places.

**TABLE 101.** *Atmospheric water-vapor lines in the visible spectrum.* **TABLE 101.**

Table 101, prepared by the Astrophysical Observatory at Washington, gives a summary of lines in Rowland's "Preliminary Table of Solar Spectrum Wave Lengths," recorded as of atmospheric water vapor origin. There are more than 400 such lines in Rowland's table, but an abridgment is here made as follows:

Only lines of intensity "1" or greater are here separately given, but the total number and average intensity of the fainter lines lying between these are inserted. Rowland's scale of intensities is such that a line of intensity "1" is "just clearly visible" on Rowland's map; the $H$ and $K$ lines are of intensity, 1,000; $D_1$ (the sodium line of greater wave length), 20; $C.$, 40. "Lines more and more difficult to see" are distinguished by 0, 00, 000, and 0000.

**TABLE 102.** *Atmospheric water-vapor bands in the infra-red spectrum.* **TABLE 102.**

The values of Table 102 relate to the transmission of energy in the minima of various water-vapor bands, when there is 1 cm. of precipitable water in the path through the air. For other amounts of water-vapor, the depths of these minima may be taken as equal to $a^{\delta}$, where $a$ is the coefficient taken from the third column of Table 102 and $\delta$ is the amount of precipitable water in the path. For average conditions in the transmission of radiation through the atmosphere, $\delta$ may be determined by the modification of Hann's formula $\delta = 2.0\,e\ \sec. Z$, where $e$ is the vapor pressure in cms. as determined by wet and dry thermometers and $Z$ is the angle which the path makes with the vertical.

For the use of the transmissions observed in such bands for the inverse process of determining the amount of water-vapor in the atmosphere, see Fowle, *Astrophysical Journal*, 35, p. 149, 1912; 37, p. 359, 1913.

**TABLE 103.** *Transmission percentages of radiation through moist air.* **TABLE 103.**

The values of Table 103 will be of use when the transmission of energy through the atmosphere containing a known amount of water-vapor is under consideration. An approximate value for the energy transmitted may be had if the amount of energy from the source between the wave-lengths of the first column is known and is multiplied by the corresponding transmission coefficients of the subsequent columns of the table. The table is compiled from Fowle, "Water-vapor Transparency," *Smithsonian Miscellaneous Collections*, 68, No. 8, 1917; see also, Fowle, "The Transparency of Aqueous Vapor," *Astrophysical Journal*, 42, p. 394, 1915.

**TABLE 104.** *International meteorological symbols.* **TABLE 104.**

The information under this heading has been compiled for the present edition by the librarian of the United States Weather Bureau, and represents current practice in the use of the symbols approved by the International Meteorological Organization. For further information on the subject of meteorological symbols, see *Monthly Weather Review* (Wash., D.C.), May, 1916, pp. 265–274.

**Table 105.** *International cloud classification.*

The text under this heading is condensed from the International Cloud Atlas, 2d edition, Paris, 1910.

**Table 106.** *Beaufort weather notation.*

This table has been revised in the library of the United States Weather Bureau, and represents the current practice of American and British observers in the use of the Beaufort letters.

**Table 107.** *List of meteorological stations.*

This list has been extensively revised in the library of the Weather Bureau, and has been enlarged to include all the stations for which data appear in the "Réseau Mondial" of the British Meteorological Office for 1912 (published 1917). The stations of the Réseau Mondial were selected to represent, so far as available data permitted, the meteorology of all land areas of the globe, on the basis of two, or in some cases three, stations for each ten-degree square of latitude and longitude.

No attempt has been made in this edition of the Smithsonian Tables to indicate the "order" of the several stations, according to the definitions adopted at the Vienna Congress of 1873; as, owing to the present widespread use of self-recording instruments, the old distinction between first and second order stations has lost much of its importance.

Several stations included in the list are no longer in operation. Data concerning the locations and altitudes of these stations are still valuable, in view of the frequent use made of their records in meteorological and climatological studies.

In general, the spellings of names are those most frequently met with in existing compilations of meteorological data, without regard to the practice of English-speaking countries. In a majority of cases the native orthography has been followed.

## THERMOMETRICAL TABLES

Conversion of thermometric scales —

Approximate Absolute, Centigrade, Fahrenheit, and Reaumur scales . . . . . . . . . . . . . . . . . . TABLE 1

Fahrenheit scale to Centigrade . . . . . . . . . . TABLE 2

Centigrade scale to Fahrenheit . . . . . . . . . . TABLE 3

Centigrade scale to Fahrenheit, near the boiling point of water . . . . . . . . . . . . . . . . . . TABLE 4

Differences Fahrenheit to differences Centigrade . . . . TABLE 5

Differences Centigrade to differences Fahrenheit . . . TABLE 6

Correction for the temperature of the emergent mercurial column of thermometers —

Correction for Fahrenheit thermometers . . . . . . . TABLE 7

Correction for Centigrade thermometers . . . . . . . TABLE 8

TABLE 1.

## APPROXIMATE ABSOLUTE, CENTIGRADE, FAHRENHEIT, AND REAUMUR SCALES.

Conversion Formulæ for Approximate Absolute ($A.A$), Centigrade ($C$), Fahrenheit ($F$), and Reaumur ($R$) Scales.

$$A.A = 5/9\ (F - 32) + 273 = C + 273 = 5/4\,R + 273$$
$$C = 5/9\ (F - 32) = 5/4\,R = A.A - 273 = \tfrac{1}{2}\ (F - 32)\left(1 + \frac{1}{10} + \frac{1}{100} + \frac{1}{1000} + \right)$$
$$F = 9/5\,C + 32 = 9/4\,R + 32 = 9/5\,(A.A - 273) + 32 = 2\,C\left(1 - \frac{1}{10}\right) + 32$$
$$R = 4/9\ (F - 32) = 4/5\,C = 4/5\,(A.A - 273)$$

PROPORTIONAL PARTS.

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| C, A.A | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| F | 1.8 | 3.6 | 5.4 | 7.2 | 9.0 | 10.8 | 12.6 | 14.4 | 16.2 |
| R | .8 | 1.6 | 2.4 | 3.2 | 4.0 | 4.8 | 5.6 | 6.4 | 7.2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| F | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| C, A.A | .55* | 1.11* | 1.66* | 2.22* | 2.77* | 3.33* | 3.88* | 4.44* | 5.00* |
| R | .44* | .88* | 1.33* | 1.77* | 2.22* | 2.66* | 3.11* | 3.55* | 4.00* |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| R | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| C, A.A | 1.25 | 2.50 | 3.75 | 5.00 | 6.25 | 7.50 | 8.75 | 10.00 | 11.25 |
| F | 2.25 | 4.50 | 6.75 | 9.00 | 11.25 | 13.50 | 15.75 | 18.00 | 20.25 |

* These last figures repeated indefinitely.

| A.A. | C. | F. | R. | A.A. | C. | F. | R. | A.A. | C. | F. | R. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 375° | 102° | 215°.6 | 81°.6 | 350° | 77° | 170°.6 | 61°.6 | 325° | 52° | 125°.6 | 41°.6 |
| 374 | 101 | 213.8 | 80.8 | 349 | 76 | 168.8 | 60.8 | 324 | 51 | 123.8 | 40.8 |
| 373 | 100 | 212.0 | 80.0 | 348 | 75 | 167.0 | 60.0 | 323 | 50 | 122.0 | 40.0 |
| 372 | 99 | 210.2 | 79.2 | 347 | 74 | 165.2 | 59.2 | 322 | 49 | 120.2 | 39.2 |
| 371 | 98 | 208.4 | 78.4 | 346 | 73 | 163.4 | 58.4 | 321 | 48 | 118.4 | 38.4 |
| 370 | 97 | 206.6 | 77.6 | 345 | 72 | 161.6 | 57.6 | 320 | 47 | 116.6 | 37.6 |
| 369 | 96 | 204.8 | 76.8 | 344 | 71 | 159.8 | 56.8 | 319 | 46 | 114.8 | 36.8 |
| 368 | 95 | 203.0 | 76.0 | 343 | 70 | 158.0 | 56.0 | 318 | 45 | 113.0 | 36.0 |
| 367 | 94 | 201.2 | 75.2 | 342 | 69 | 156.2 | 55.2 | 317 | 44 | 111.2 | 35.2 |
| 366 | 93 | 199.4 | 74.4 | 341 | 68 | 154.4 | 54.4 | 316 | 43 | 109.4 | 34.4 |
| 365 | 92 | 197.6 | 73.6 | 340 | 67 | 152.6 | 53.6 | 315 | 42 | 107.6 | 33.6 |
| 364 | 91 | 195.8 | 72.8 | 339 | 66 | 150.8 | 52.8 | 314 | 41 | 105.8 | 32.8 |
| 363 | 90 | 194.0 | 72.0 | 338 | 65 | 149.0 | 52.0 | 313 | 40 | 104.0 | 32.0 |
| 362 | 89 | 192.2 | 71.2 | 337 | 64 | 147.2 | 51.2 | 312 | 39 | 102.2 | 31.2 |
| 361 | 88 | 190.4 | 70.4 | 336 | 63 | 145.4 | 50.4 | 311 | 38 | 100.4 | 30.4 |
| 360 | 87 | 188.6 | 69.6 | 335 | 62 | 143.6 | 49.6 | 310 | 37 | 98.6 | 29.6 |
| 359 | 86 | 186.8 | 68.8 | 334 | 61 | 141.8 | 48.8 | 309 | 36 | 96.8 | 28.8 |
| 358 | 85 | 185.0 | 68.0 | 333 | 60 | 140.0 | 48.0 | 308 | 35 | 95.0 | 28.0 |
| 357 | 84 | 183.2 | 67.2 | 332 | 59 | 138.2 | 47.2 | 307 | 34 | 93.2 | 27.2 |
| 356 | 83 | 181.4 | 66.4 | 331 | 58 | 136.4 | 46.4 | 306 | 33 | 91.4 | 26.4 |
| 355 | 82 | 179.6 | 65.6 | 330 | 57 | 134.6 | 45.6 | 305 | 32 | 89.6 | 25.6 |
| 354 | 81 | 177.8 | 64.8 | 329 | 56 | 132.8 | 44.8 | 304 | 31 | 87.8 | 24.8 |
| 353 | 80 | 176.0 | 64.0 | 328 | 55 | 131.0 | 44.0 | 303 | 30 | 86.0 | 24.0 |
| 352 | 79 | 174.2 | 63.2 | 327 | 54 | 129.2 | 43.2 | 302 | 29 | 84.2 | 23.2 |
| 351 | 78 | 172.4 | 62.4 | 326 | 53 | 127.4 | 42.4 | 301 | 28 | 82.4 | 22.4 |
| 350 | 77 | 170.6 | 61.6 | 325 | 52 | 125.6 | 41.6 | 300 | 27 | 80.6 | 21.6 |
| A.A. | C. | F. | R. | A.A. | C. | F. | R. | A.A. | C. | F. | R. |

## APPROXIMATE ABSOLUTE, CENTIGRADE, FAHRENHEIT, AND REAUMUR SCALES.

| A.A. | C. | F. | R. | A.A. | C. | F. | R. | A.A. | C. | F. | R. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 300° | 27° | 80°.6 | 21°.6 | 250° | −23° | − 9°.4 | −18°.4 | 200° | −73° | − 99°.4 | −58°.4 |
| 299 | 26 | 78.8 | 20.8 | 249 | 24 | 11.2 | 19.2 | 199 | 74 | 101.2 | 59.2 |
| 298 | 25 | 77.0 | 20.0 | 248 | 25 | 13.0 | 20.0 | 198 | 75 | 103.0 | 60.0 |
| 297 | 24 | 75.2 | 19.2 | 247 | 26 | 14.8 | 20.8 | 197 | 76 | 104.8 | 60.8 |
| 296 | 23 | 73.4 | 18.4 | 246 | 27 | 16.6 | 21.6 | 196 | 77 | 106.6 | 61.6 |
| 295 | 22 | 71.6 | 17.6 | 245 | −28 | −18.4 | −22.4 | 195 | −78 | −108.4 | −62.4 |
| 294 | 21 | 69.8 | 16.8 | 244 | 29 | 20.2 | 23.2 | 194 | 79 | 110.2 | 63.2 |
| 293 | 20 | 68.0 | 16.0 | 243 | 30 | 22.0 | 24.0 | 193 | 80 | 112.0 | 64.0 |
| 292 | 19 | 66.2 | 15.2 | 242 | 31 | 23.8 | 24.8 | 192 | 81 | 113.8 | 64.8 |
| 291 | 18 | 64.4 | 14.4 | 241 | 32 | 25.6 | 25.6 | 191 | 82 | 115.6 | 65.6 |
| 290 | 17 | 62.6 | 13.6 | 240 | −33 | −27.4 | −26.4 | 190 | −83 | −117.4 | −66.4 |
| 289 | 16 | 60.8 | 12.8 | 239 | 34 | 29.2 | 27.2 | 189 | 84 | 119.2 | 67.2 |
| 288 | 15 | 59.0 | 12.0 | 238 | 35 | 31.0 | 28.0 | 188 | 85 | 121.0 | 68.0 |
| 287 | 14 | 57.2 | 11.2 | 237 | 36 | 32.8 | 28.8 | 187 | 86 | 122.8 | 68.8 |
| 286 | 13 | 55.4 | 10.4 | 236 | 37 | 34.6 | 29.6 | 186 | 87 | 124.6 | 69.6 |
| 285 | 12 | 53.6 | 9.6 | 235 | −38 | −36.4 | −30.4 | 185 | −88 | −126.4 | −70.4 |
| 284 | 11 | 51.8 | 8.8 | 234 | 39 | 38.2 | 31.2 | 184 | 89 | 128.2 | 71.2 |
| 283 | 10 | 50.0 | 8.0 | 233 | 40 | 40.0 | 32.0 | 183 | 90 | 130.0 | 72.0 |
| 282 | 9 | 48.2 | 7.2 | 232 | 41 | 41.8 | 32.8 | 182 | 91 | 131.8 | 72.8 |
| 281 | 8 | 46.4 | 6.4 | 231 | 42 | 43.6 | 33.6 | 181 | 92 | 133.6 | 73.6 |
| 280 | 7 | 44.6 | 5.6 | 230 | −43 | −45.4 | −34.4 | 180 | −93 | −135.4 | −74.4 |
| 279 | 6 | 42.8 | 4.8 | 229 | 44 | 47.2 | 35.2 | 179 | 94 | 137.2 | 75.2 |
| 278 | 5 | 41.0 | 4.0 | 228 | 45 | 49.0 | 36.0 | 178 | 95 | 139.0 | 76.0 |
| 277 | 4 | 39.2 | 3.2 | 227 | 46 | 50.8 | 36.8 | 177 | 96 | 140.8 | 76.8 |
| 276 | 3 | 37.4 | 2.4 | 226 | 47 | 52.6 | 37.6 | 176 | 97 | 142.6 | 77.6 |
| 275 | + 2 | 35.6 | + 1.6 | 225 | −48 | −54.4 | −38.4 | 175 | −98 | −144.4 | −78.4 |
| 274 | + 1 | 33.8 | + 0.8 | 224 | 49 | 56.2 | 39.2 | 174 | 99 | 146.2 | 79.2 |
| 273 | ± 0 | 32.0 | ± 0.0 | 223 | 50 | 58.0 | 40.0 | 173 | 100 | 148.0 | 80.0 |
| 272 | − 1 | 30.2 | − 0.8 | 222 | 51 | 59.8 | 40.8 | 172 | 101 | 149.8 | 80.8 |
| 271 | − 2 | 28.4 | − 1.6 | 221 | 52 | 61.6 | 41.6 | 171 | 102 | 151.6 | 81.6 |
| 270 | − 3 | 26.6 | − 2.4 | 220 | −53 | −63.4 | −42.4 | 170 | −103 | −153.4 | −82 4 |
| 269 | 4 | 24.8 | 3.2 | 219 | 54 | 65.2 | 43.2 | 169 | 104 | 155.2 | 83.2 |
| 268 | 5 | 23.0 | 4.0 | 218 | 55 | 67.0 | 44.0 | 168 | 105 | 157.0 | 84.0 |
| 267 | 6 | 21.2 | 4.8 | 217 | 56 | 68.8 | 44.8 | 167 | 106 | 158.8 | 84.8 |
| 266 | 7 | 19.4 | 5.6 | 216 | 57 | 70.6 | 45.6 | 166 | 107 | 160.6 | 85.6 |
| 265 | − 8 | 17.6 | − 6.4 | 215 | −58 | −72.4 | −46.4 | 165 | −108 | −162.4 | −86.4 |
| 264 | 9 | 15.8 | 7.2 | 214 | 59 | 74.2 | 47.2 | 164 | 109 | 164.2 | 87.2 |
| 263 | 10 | 14.0 | 8.0 | 213 | 60 | 76.0 | 48.0 | 163 | 110 | 166.0 | 88.0 |
| 262 | 11 | 12.2 | 8.8 | 212 | 61 | 77.8 | 48.8 | 162 | 111 | 167.8 | 88.8 |
| 261 | 12 | 10.4 | 9.6 | 211 | 62 | 79.6 | 49.6 | 161 | 112 | 169.6 | 89.6 |
| 260 | −13 | 8.6 | −10.4 | 210 | −63 | −81.4 | −50.4 | 160 | −113 | −171.4 | −90.4 |
| 259 | 14 | 6.8 | 11.2 | 209 | 64 | 83.2 | 51.2 | 159 | 114 | 173.2 | 91.2 |
| 258 | 15 | 5.0 | 12.0 | 208 | 65 | 85.0 | 52.0 | 158 | 115 | 175.0 | 92.0 |
| 257 | 16 | 3.2 | 12.8 | 207 | 66 | 86.8 | 52.8 | 157 | 116 | 176.8 | 92.8 |
| 256 | 17 | + 1.4 | 13.6 | 206 | 67 | 88.6 | 53.6 | 156 | 117 | 178.6 | 93.6 |
| 255 | −18 | −0.4 | −14.4 | 205 | −68 | −90.4 | −54.4 | 155 | −118 | −180.4 | −94.4 |
| 254 | 19 | 2.2 | 15.2 | 204 | 69 | 92.2 | 55.2 | 154 | 119 | 182.2 | 95.2 |
| 253 | 20 | 4.0 | 16.0 | 203 | 70 | 94.0 | 56.0 | 153 | 120 | 184.0 | 96.0 |
| 252 | 21 | 5.8 | 16.8 | 202 | 71 | 95.8 | 56.8 | 152 | 121 | 185.8 | 96.8 |
| 251 | 22 | 7.6 | 17.6 | 201 | 72 | 97.6 | 57.6 | 151 | 122 | 187.6 | 97.6 |
| 250 | −23 | −9.4 | −18.4 | 200 | −73 | −99.4 | −58.4 | 150 | −123 | −189.4 | −98.4 |
| A.A. | C. | F. | R. | A.A. | C. | F. | R. | A.A. | C. | F. | R. |

TABLE 1

## APPROXIMATE ABSOLUTE, CENTIGRADE, FAHRENHEIT, AND REAUMUR SCALES.

| A.A. | C. | F. | R. | A.A. | C. | F. | R. | A.A. | C. | F. | R. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 150° | −123° | −189°.4 | −98°.4 | 100° | −173° | −279°.4 | −138°.4 | 50° | −223° | −369°.4 | −178°.4 |
| 149 | 124 | 191.2 | 99.2 | 99 | 174 | 281.2 | 139.2 | 49 | 224 | 371.2 | 179.2 |
| 148 | 125 | 193.0 | 100.0 | 98 | 175 | 283.0 | 140.0 | 48 | 225 | 373.0 | 180.0 |
| 147 | 126 | 194.8 | 100.8 | 97 | 176 | 284.8 | 140.8 | 47 | 226 | 374.8 | 180.8 |
| 146 | 127 | 196.6 | 101.6 | 96 | 177 | 286.6 | 141.6 | 46 | 227 | 376.6 | 181.6 |
| 145 | −128 | −198.4 | −102.4 | 95 | −178 | −288.4 | −142.4 | 45 | −228 | −378.4 | −182.4 |
| 144 | 129 | 200.2 | 103.2 | 94 | 179 | 290.2 | 143.2 | 44 | 229 | 380.2 | 183.2 |
| 143 | 130 | 202.0 | 104.0 | 93 | 180 | 292.0 | 144.0 | 43 | 230 | 382.0 | 184.0 |
| 142 | 131 | 203.8 | 104.8 | 92 | 181 | 293.8 | 144.8 | 42 | 231 | 383.8 | 184.8 |
| 141 | 132 | 205.6 | 105.6 | 91 | 182 | 295.6 | 145.6 | 41 | 232 | 385.6 | 185.6 |
| 140 | −133 | −207.4 | −106.4 | 90 | −183 | −297.4 | −146.4 | 40 | −233 | −387.4 | −186.4 |
| 139 | 134 | 209.2 | 107.2 | 89 | 184 | 299.2 | 147.2 | 39 | 234 | 389.2 | 187.2 |
| 138 | 135 | 211.0 | 108.0 | 88 | 185 | 301.0 | 148.0 | 38 | 235 | 391.0 | 188.0 |
| 137 | 136 | 212.8 | 108.8 | 87 | 186 | 302.8 | 148.8 | 37 | 236 | 392.8 | 188.8 |
| 136 | 137 | 214.6 | 109.6 | 86 | 187 | 304.6 | 149.6 | 36 | 237 | 394.6 | 189.6 |
| 135 | −138 | −216.4 | −110.4 | 85 | −188 | −306.4 | −150.4 | 35 | −238 | −396.4 | −190.4 |
| 134 | 139 | 218.2 | 111.2 | 84 | 189 | 308.2 | 151.2 | 34 | 239 | 398.2 | 191.2 |
| 133 | 140 | 220.0 | 112.0 | 83 | 190 | 310.0 | 152.0 | 33 | 240 | 400.0 | 192.0 |
| 132 | 141 | 221.8 | 112.8 | 82 | 191 | 311.8 | 152.8 | 32 | 241 | 401.8 | 192.8 |
| 131 | 142 | 223.6 | 113.6 | 81 | 192 | 313.6 | 153.6 | 31 | 242 | 403.6 | 193.6 |
| 130 | −143 | −225.4 | −114.4 | 80 | −193 | −315.4 | −154.4 | 30 | −243 | −405.4 | −194.4 |
| 129 | 144 | 227.2 | 115.2 | 79 | 194 | 317.2 | 155.2 | 29 | 244 | 407.2 | 195.2 |
| 128 | 145 | 229.0 | 116.0 | 78 | 195 | 319.0 | 156.0 | 28 | 245 | 409.0 | 196.0 |
| 127 | 146 | 230.8 | 116.8 | 77 | 196 | 320.8 | 156.8 | 27 | 246 | 410.8 | 196.8 |
| 126 | 147 | 232.6 | 117.6 | 76 | 197 | 322.6 | 157.6 | 26 | 247 | 412.6 | 197.6 |
| 125 | −148 | −234.4 | −118.4 | 75 | −198 | −324.4 | −158.4 | 25 | −248 | −414.4 | −198.4 |
| 124 | 149 | 236.2 | 119.2 | 74 | 199 | 326.2 | 159.2 | 24 | 249 | 416.2 | 199.2 |
| 123 | 150 | 238.0 | 120.0 | 73 | 200 | 328.0 | 160.0 | 23 | 250 | 418.0 | 200.0 |
| 122 | 151 | 239.8 | 120.8 | 72 | 201 | 329.8 | 160.8 | 22 | 251 | 419.8 | 200.8 |
| 121 | 152 | 241.6 | 121.6 | 71 | 202 | 331.6 | 161.6 | 21 | 252 | 421.6 | 201.6 |
| 120 | −153 | −243.4 | −122.4 | 70 | −203 | −333.4 | −162.4 | 20 | −253 | −423.4 | −202.4 |
| 119 | 154 | 245.2 | 123.2 | 69 | 204 | 335.2 | 163.2 | 19 | 254 | 425.2 | 203.2 |
| 118 | 155 | 247.0 | 124.0 | 68 | 205 | 337.0 | 164.0 | 18 | 255 | 427.0 | 204.0 |
| 117 | 156 | 248.8 | 124.8 | 67 | 206 | 338.8 | 164.8 | 17 | 256 | 428.8 | 204.8 |
| 116 | 157 | 250.6 | 125.6 | 66 | 207 | 340.6 | 165.6 | 16 | 257 | 430.6 | 205.6 |
| 115 | −158 | −252.4 | −126.4 | 65 | −208 | −342.4 | −166.4 | 15 | −258 | −432.4 | −206.4 |
| 114 | 159 | 254.2 | 127.2 | 64 | 209 | 344.2 | 167.2 | 14 | 259 | 434.2 | 207.2 |
| 113 | 160 | 256.0 | 128.0 | 63 | 210 | 346.0 | 168.0 | 13 | 260 | 436.0 | 208.0 |
| 112 | 161 | 257.8 | 128.8 | 62 | 211 | 347.8 | 168.8 | 12 | 261 | 437.8 | 208.8 |
| 111 | 162 | 259.6 | 129.6 | 61 | 212 | 349.6 | 169.6 | 11 | 262 | 439.6 | 209.6 |
| 110 | −163 | −261.4 | −130.4 | 60 | −213 | −351.4 | −170.4 | 10 | −263 | −441.4 | −210.4 |
| 109 | 164 | 263.2 | 131.2 | 59 | 214 | 353.2 | 171.2 | 9 | 264 | 443.2 | 211.2 |
| 108 | 165 | 265.0 | 132.0 | 58 | 215 | 355.0 | 172.0 | 8 | 265 | 445.0 | 212.0 |
| 107 | 166 | 266.8 | 132.8 | 57 | 216 | 356.8 | 172.8 | 7 | 266 | 446.8 | 212.8 |
| 106 | 167 | 268.6 | 133.6 | 56 | 217 | 358.6 | 173.6 | 6 | 267 | 448.6 | 213.6 |
| 105 | −168 | −270.4 | −134.4 | 55 | −218 | −360.4 | −174.4 | 5 | −268 | −450.4 | −214.4 |
| 104 | 169 | 272.2 | 135.2 | 54 | 219 | 362.2 | 175.2 | 4 | 269 | 452.2 | 215.2 |
| 103 | 170 | 274.0 | 136.0 | 53 | 220 | 364.0 | 176.0 | 3 | 270 | 454.0 | 216.0 |
| 102 | 171 | 275.8 | 136.8 | 52 | 221 | 365.8 | 176.8 | 2 | 271 | 455.8 | 216.8 |
| 101 | 172 | 277.6 | 137.6 | 51 | 222 | 367.6 | 177.6 | 1 | 272 | 457.6 | 217.6 |
| 100 | −173 | −279.4 | −138.4 | 50 | −223 | −369.4 | −178.4 | 0 | −273 | −459.4 | −218.4 |
| A.A. | C. | F. | R. | A.A. | C. | F. | R. | A.A. | C. | F. | R. |

## FAHRENHEIT SCALE TO CENTIGRADE.

| Fahrenheit. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| +130° | +54°.44 | +54°.50 | +54°.56 | +54°.61 | +54°.67 | +54°.72 | +54°.78 | +54°.83 | +54°.89 | +54°.94 |
| 129 | 53.89 | 53.94 | 54.00 | 54.06 | 54.11 | 54.17 | 54.22 | 54.28 | 54.33 | 54.39 |
| 128 | 53.33 | 53.39 | 53.44 | 53.50 | 53.56 | 53.61 | 53.67 | 53.72 | 53.78 | 53.83 |
| 127 | 52.78 | 52.83 | 52.89 | 52.94 | 53.00 | 53.06 | 53.11 | 53.17 | 53.22 | 53.28 |
| 126 | 52.22 | 52.28 | 52.33 | 52.39 | 52.44 | 52.50 | 52.56 | 52.61 | 52.67 | 52.72 |
| +125 | +51.67 | +51.72 | +51.78 | +51.83 | +51.89 | +51.94 | +52.00 | +52.06 | +52.11 | +52.17 |
| 124 | 51.11 | 51.17 | 51.22 | 51.28 | 51.33 | 51.39 | 51.44 | 51.50 | 51.56 | 51.61 |
| 123 | 50.56 | 50.61 | 50.67 | 50.72 | 50.78 | 50.83 | 50.89 | 50.94 | 51.00 | 51.06 |
| 122 | 50.00 | 50.06 | 50.11 | 50.17 | 50.22 | 50.28 | 50.33 | 50.39 | 50.44 | 50.50 |
| 121 | 49.44 | 49.50 | 49.56 | 49.61 | 49.67 | 49.72 | 49.78 | 49.83 | 49.89 | 49.94 |
| +120 | +48.89 | +48.94 | +49.00 | +49.06 | +49.11 | +49.17 | +49.22 | +49.28 | +49.33 | +49.39 |
| 119 | 48.33 | 48.39 | 48.44 | 48.50 | 48.56 | 48.61 | 48.67 | 48.72 | 48.78 | 48.83 |
| 118 | 47.78 | 47.83 | 47.89 | 47.94 | 48.00 | 48.06 | 48.11 | 48.17 | 48.22 | 48.28 |
| 117 | 47.22 | 47.28 | 47.33 | 47.39 | 47.44 | 47.50 | 47.56 | 47.61 | 47.67 | 47.72 |
| 116 | 46.67 | 46.72 | 46.78 | 46.83 | 46.89 | 46.94 | 47.00 | 47.06 | 47.11 | 47.17 |
| +115 | +46.11 | +46.17 | +46.22 | +46.28 | +46.33 | +46.39 | +46.44 | +46.50 | +46.56 | +46.61 |
| 114 | 45.56 | 45.61 | 45.67 | 45.72 | 45.78 | 45.83 | 45.89 | 45.94 | 46.00 | 46.06 |
| 113 | 45.00 | 45.06 | 45.11 | 45.17 | 45.22 | 45.28 | 45.33 | 45.39 | 45.44 | 45.50 |
| 112 | 44.44 | 44.50 | 44.56 | 44.61 | 44.67 | 44.72 | 44.78 | 44.83 | 44.89 | 44.94 |
| 111 | 43.89 | 43.94 | 44.00 | 44.06 | 44.11 | 44.17 | 44.22 | 44.28 | 44.33 | 44.39 |
| +110 | +43.33 | +43.39 | +43.44 | +43.50 | +43.56 | +43.61 | +43.67 | +43.72 | +43.78 | +43.83 |
| 109 | 42.78 | 42.83 | 42.89 | 42.94 | 43.00 | 43.06 | 43.11 | 43.17 | 43.22 | 43.28 |
| 108 | 42.22 | 42.28 | 42.33 | 42.39 | 42.44 | 42.50 | 42.56 | 42.61 | 42.67 | 42.72 |
| 107 | 41.67 | 41.72 | 41.78 | 41.83 | 41.89 | 41.94 | 42.00 | 42.06 | 42.11 | 42.17 |
| 106 | 41.11 | 41.17 | 41.22 | 41.28 | 41.33 | 41.39 | 41.44 | 41.50 | 41.56 | 41.61 |
| +105 | +40.56 | +40.61 | +40.67 | +40.72 | +40.78 | +40.83 | +40.89 | +40.94 | +41.00 | +41.06 |
| 104 | 40.00 | 40.06 | 40.11 | 40.17 | 40.22 | 40.28 | 40.33 | 40.39 | 40.44 | 40.50 |
| 103 | 39.44 | 39.50 | 39.56 | 39.61 | 39.67 | 39.72 | 39.78 | 39.83 | 39.89 | 39.94 |
| 102 | 38.89 | 38.94 | 39.00 | 39.06 | 39.11 | 39.17 | 39.22 | 39.28 | 39.33 | 39.39 |
| 101 | 38.33 | 38.39 | 38.44 | 38.50 | 38.56 | 38.61 | 38.67 | 38.72 | 38.78 | 38.83 |
| +100 | +37.78 | +37.83 | +37.89 | +37.94 | +38.00 | +38.06 | +38.11 | +38.17 | +38.22 | +38.28 |
| 99 | 37.22 | 37.28 | 37.33 | 37.39 | 37.44 | 37.50 | 37.56 | 37.61 | 37.67 | 37.72 |
| 98 | 36.67 | 36.72 | 36.78 | 36.83 | 36.89 | 36.94 | 37.00 | 37.06 | 37.11 | 37.17 |
| 97 | 36.11 | 36.17 | 36.22 | 36.28 | 36.33 | 36.39 | 36.44 | 36.50 | 36.56 | 36.61 |
| 96 | 35.56 | 35.61 | 35.67 | 35.72 | 35.78 | 35.83 | 35.89 | 35.94 | 36.00 | 36.06 |
| +95 | +35.00 | +35.06 | +35.11 | +35.17 | +35.22 | +35.28 | +35.33 | +35.39 | +35.44 | +35.50 |
| 94 | 34.44 | 34.50 | 34.56 | 34.61 | 34.67 | 34.72 | 34.78 | 34.83 | 34.89 | 34.94 |
| 93 | 33.89 | 33.94 | 34.00 | 34.06 | 34.11 | 34.17 | 34.22 | 34.28 | 34.33 | 34.39 |
| 92 | 33.33 | 33.39 | 33.44 | 33.50 | 33.56 | 33.61 | 33.67 | 33.72 | 33.78 | 33.83 |
| 91 | 32.78 | 32.83 | 32.89 | 32.94 | 33.00 | 33.06 | 33.11 | 33.17 | 33.22 | 33.28 |
| +90 | +32.22 | +32.28 | +32.33 | +32.39 | +32.44 | +32.50 | +32.56 | +32.61 | +32.67 | +32.72 |
| 89 | 31.67 | 31.72 | 31.78 | 31.83 | 31.89 | 31.94 | 32.00 | 32.06 | 32.11 | 32.17 |
| 88 | 31.11 | 31.17 | 31.22 | 31.28 | 31.33 | 31.39 | 31.44 | 31.50 | 31.56 | 31.61 |
| 87 | 30.56 | 30.61 | 30.67 | 30.72 | 30.78 | 30.83 | 30.89 | 30.94 | 31.00 | 31.06 |
| 86 | 30.00 | 30.06 | 30.11 | 30.17 | 30.22 | 30.28 | 30.33 | 30.39 | 30.44 | 30.50 |
| +85 | +29.44 | +29.50 | +29.56 | +29.61 | +29.67 | +29.72 | +29.78 | +29.83 | +29.89 | +29.94 |
| 84 | 28.89 | 28.94 | 29.00 | 29.06 | 29.11 | 29.17 | 29.22 | 29.28 | 29.33 | 29.39 |
| 83 | 28.33 | 28.39 | 28.44 | 28.50 | 28.56 | 28.61 | 28.67 | 28.72 | 28.78 | 28.83 |
| 82 | 27.78 | 27.83 | 27.89 | 27.94 | 28.00 | 28.06 | 28.11 | 28.17 | 28.22 | 28.28 |
| 81 | 27.22 | 27.28 | 27.33 | 27.39 | 27.44 | 27.50 | 27.56 | 27.61 | 27.67 | 27.72 |
| +80 | +26.67 | +26.72 | +26.78 | +26.83 | +26.89 | +26.94 | +27.00 | +27.06 | +27.11 | +27.17 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

TABLE 2.

## FAHRENHEIT SCALE TO CENTIGRADE.

| Fahrenheit. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| +80° | +26°.67 | +26°.72 | +26°.78 | +26°.83 | +26°.89 | +26°.94 | +27°.00 | +27°.06 | +27°.11 | +27°.17 |
| 79 | 26.11 | 26.17 | 26.22 | 26.28 | 26.33 | 26.39 | 26.44 | 26.50 | 26.56 | 26.61 |
| 78 | 25.56 | 25.61 | 25.67 | 25.72 | 25.78 | 25.83 | 25.89 | 25.94 | 26.00 | 26.06 |
| 77 | 25.00 | 25.06 | 25.11 | 25.17 | 25.22 | 25.28 | 25.33 | 25.39 | 25.44 | 25.50 |
| 76 | 24.44 | 24.50 | 24.56 | 24.61 | 24.67 | 24.72 | 24.78 | 24.83 | 24.89 | 24.94 |
| +75 | +23.89 | +23.94 | +24.00 | +24.06 | +24.11 | +24.17 | +24.22 | +24.28 | +24.33 | +24.39 |
| 74 | 23.33 | 23.39 | 23.44 | 23.50 | 23.56 | 23.61 | 23.67 | 23.72 | 23.78 | 23.83 |
| 73 | 22.78 | 22.83 | 22.89 | 22.94 | 23.00 | 23.06 | 23.11 | 23.17 | 23.22 | 23.28 |
| 72 | 22.22 | 22.28 | 22.33 | 22.39 | 22.44 | 22.50 | 22.56 | 22.61 | 22.67 | 22.72 |
| 71 | 21.67 | 21.72 | 21.78 | 21.83 | 21.89 | 21.94 | 22.00 | 22.06 | 22.11 | 22.17 |
| +70 | +21.11 | +21.17 | +21.22 | +21.28 | +21.33 | +21.39 | +21.44 | +21.50 | +21.56 | +21.61 |
| 69 | 20.56 | 20.61 | 20.67 | 20.72 | 20.78 | 20.83 | 20.89 | 20.94 | 21.00 | 21.06 |
| 68 | 20.00 | 20.06 | 20.11 | 20.17 | 20.22 | 20.28 | 20.33 | 20.39 | 20.44 | 20.50 |
| 67 | 19.44 | 19.50 | 19.56 | 19.61 | 19.67 | 19.72 | 19.78 | 19.83 | 19.89 | 19.94 |
| 66 | 18.89 | 18.94 | 19.00 | 19.06 | 19.11 | 19.17 | 19.22 | 19.28 | 19.33 | 19.39 |
| +65 | +18.33 | +18.39 | +18.44 | +18.50 | +18.56 | +18.61 | +18.67 | +18.72 | +18.78 | +18.83 |
| 64 | 17.78 | 17.83 | 17.89 | 17.94 | 18.00 | 18.06 | 18.11 | 18.17 | 18.22 | 18.28 |
| 63 | 17.22 | 17.28 | 17.33 | 17.39 | 17.44 | 17.50 | 17.56 | 17.61 | 17.67 | 17.72 |
| 62 | 16.67 | 16.72 | 16.78 | 16.83 | 16.89 | 16.94 | 17.00 | 17.06 | 17.11 | 17.17 |
| 61 | 16.11 | 16.17 | 16.22 | 16.28 | 16.33 | 16.39 | 16.44 | 16.50 | 16.56 | 16.61 |
| +60 | +15.56 | +15.61 | +15.67 | +15.72 | +15.78 | +15.83 | +15.89 | +15.94 | +16.00 | +16.06 |
| 59 | 15.00 | 15.06 | 15.11 | 15.17 | 15.22 | 15.28 | 15.33 | 15.39 | 15.44 | 15.50 |
| 58 | 14.44 | 14.50 | 14.56 | 14.61 | 14.67 | 14.72 | 14.78 | 14.83 | 14.89 | 14.94 |
| 57 | 13.89 | 13.94 | 14.00 | 14.06 | 14.11 | 14.17 | 14.22 | 14.28 | 14.33 | 14.39 |
| 56 | 13.33 | 13.39 | 13.44 | 13.50 | 13.56 | 13.61 | 13.67 | 13.72 | 13.78 | 13.83 |
| +55 | +12.78 | +12.83 | +12.89 | +12.94 | +13.00 | +13.06 | +13.11 | +13.17 | +13.22 | +13.28 |
| 54 | 12.22 | 12.28 | 12.33 | 12.39 | 12.44 | 12.50 | 12.56 | 12.61 | 12.67 | 12.72 |
| 53 | 11.67 | 11.72 | 11.78 | 11.83 | 11.89 | 11.94 | 12.00 | 12.06 | 12.11 | 12.17 |
| 52 | 11.11 | 11.17 | 11.22 | 11.28 | 11.33 | 11.39 | 11.44 | 11.50 | 11.56 | 11.61 |
| 51 | 10.56 | 10.61 | 10.67 | 10.72 | 10.78 | 10.83 | 10.89 | 10.94 | 11.00 | 11.06 |
| +50 | +10.00 | +10.06 | +10.11 | +10.17 | +10.22 | +10.28 | +10.33 | +10.39 | +10.44 | +10.50 |
| 49 | 9.44 | 9.50 | 9.56 | 9.61 | 9.67 | 9.72 | 9.78 | 9.83 | 9.89 | 9.94 |
| 48 | 8.89 | 8.94 | 9.00 | 9.06 | 9.11 | 9.17 | 9.22 | 9.28 | 9.33 | 9.39 |
| 47 | 8.33 | 8.39 | 8.44 | 8.50 | 8.56 | 8.61 | 8.67 | 8.72 | 8.78 | 8.83 |
| 46 | 7.78 | 7.83 | 7.89 | 7.94 | 8.00 | 8.06 | 8.11 | 8.17 | 8.22 | 8.28 |
| +45 | + 7.22 | + 7.28 | + 7.33 | + 7.39 | + 7.44 | + 7.50 | + 7.56 | + 7.61 | + 7.67 | + 7.72 |
| 44 | 6.67 | 6.72 | 6.78 | 6.83 | 6.89 | 6.94 | 7.00 | 7.06 | 7.11 | 7.17 |
| 43 | 6.11 | 6.17 | 6.22 | 6.28 | 6.33 | 6.39 | 6.44 | 6.50 | 6.56 | 6.61 |
| 42 | 5.56 | 5.61 | 5.67 | 5.72 | 5.78 | 5.83 | 5.89 | 5.94 | 6.00 | 6.06 |
| 41 | 5.00 | 5.06 | 5.11 | 5.17 | 5.22 | 5.28 | 5.33 | 5.39 | 5.44 | 5.50 |
| +40 | + 4.44 | + 4.50 | + 4.56 | + 4.61 | + 4.67 | + 4.72 | + 4.78 | + 4.83 | + 4.89 | + 4.94 |
| 39 | 3.89 | 3.94 | 4.00 | 4.06 | 4.11 | 4.17 | 4.22 | 4.28 | 4.33 | 4.39 |
| 38 | 3.33 | 3.39 | 3.44 | 3.50 | 3.56 | 3.61 | 3.67 | 3.72 | 3.78 | 3.83 |
| 37 | 2.78 | 2.83 | 2.89 | 2.94 | 3.00 | 3.06 | 3.11 | 3.17 | 3.22 | 3.28 |
| 36 | 2.22 | 2.28 | 2.33 | 2.39 | 2.44 | 2.50 | 2.56 | 2.61 | 2.67 | 2.72 |
| +35 | + 1.67 | + 1.72 | + 1.78 | + 1.83 | + 1.89 | + 1.94 | + 2.00 | + 2.06 | + 2.11 | + 2.17 |
| 34 | + 1.11 | + 1.17 | + 1.22 | + 1.28 | + 1.33 | + 1.39 | + 1.44 | + 1.50 | + 1.56 | + 1.61 |
| 33 | + 0.56 | + 0.61 | + 0.67 | + 0.72 | + 0.78 | + 0.83 | + 0.89 | + 0.94 | + 1.00 | + 1.06 |
| 32 | 0.00 | + 0.06 | + 0.11 | + 0.17 | + 0.22 | + 0.28 | + 0.33 | + 0.39 | + 0.44 | + 0.50 |
| 31 | − 0.56 | − 0.50 | − 0.44 | − 0.39 | − 0.33 | − 0.28 | − 0.22 | − 0.17 | − 0.11 | − 0.06 |
| +30 | − 1.11 | − 1.06 | − 1.00 | − 0.94 | − 0.89 | − 0.83 | − 0.78 | − 0.72 | − 0.67 | − 0.61 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

## FAHRENHEIT SCALE TO CENTIGRADE.

| Fahrenheit. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| +30° | − 1°.11 | − 1°.06 | − 1°.00 | − 0°.94 | − 0°.89 | − 0°.83 | − 0°.78 | − 0°.72 | − 0°.67 | − 0°.61 |
| 29 | 1.67 | 1.61 | 1.56 | 1.50 | 1.44 | 1.39 | 1.33 | 1.28 | 1.22 | 1.17 |
| 28 | 2.22 | 2.17 | 2.11 | 2.06 | 2.00 | 1.94 | 1.89 | 1.83 | 1.78 | 1.72 |
| 27 | 2.78 | 2.72 | 2.67 | 2.61 | 2.56 | 2.50 | 2.44 | 2.39 | 2.33 | 2.28 |
| 26 | 3.33 | 3.28 | 3.22 | 3.17 | 3.11 | 3.06 | 3.00 | 2.94 | 2.89 | 2.83 |
| +25 | − 3.89 | − 3.83 | − 3.78 | − 3.72 | − 3.67 | − 3.61 | − 3.56 | − 3.50 | − 3.44 | − 3.39 |
| 24 | 4.44 | 4.39 | 4.33 | 4.28 | 4.22 | 4.17 | 4.11 | 4.06 | 4.00 | 3.94 |
| 23 | 5.00 | 4.94 | 4.89 | 4.83 | 4.78 | 4.72 | 4.67 | 4.61 | 4.56 | 4.50 |
| 22 | 5.56 | 5.50 | 5.44 | 5.39 | 5.33 | 5.28 | 5.22 | 5.17 | 5.11 | 5.06 |
| 21 | 6.11 | 6.06 | 6.00 | 5.94 | 5.89 | 5.83 | 5.78 | 5.72 | 5.67 | 5.61 |
| +20 | − 6.67 | − 6.61 | − 6.56 | − 6.50 | − 6.44 | − 6.39 | − 6.33 | − 6.28 | − 6.22 | − 6.17 |
| 19 | 7.22 | 7.17 | 7.11 | 7.06 | 7.00 | 6.94 | 6.89 | 6.83 | 6.78 | 6.72 |
| 18 | 7.78 | 7.72 | 7.67 | 7.61 | 7.56 | 7.50 | 7.44 | 7.39 | 7.33 | 7.28 |
| 17 | 8.33 | 8.28 | 8.22 | 8.17 | 8.11 | 8.06 | 8.00 | 7.94 | 7.89 | 7.83 |
| 16 | 8.89 | 8.83 | 8.78 | 8.72 | 8.67 | 8.61 | 8.56 | 8.50 | 8.44 | 8.39 |
| +15 | − 9.44 | − 9.39 | − 9.33 | − 9.28 | − 9.22 | − 9.17 | − 9.11 | − 9.06 | − 9.00 | − 8.94 |
| 14 | 10.00 | 9.94 | 9.89 | 9.83 | 9.78 | 9.72 | 9.67 | 9.61 | 9.56 | 9.50 |
| 13 | 10.56 | 10.50 | 10.44 | 10.39 | 10.33 | 10.28 | 10.22 | 10.17 | 10.11 | 10.06 |
| 12 | 11.11 | 11.06 | 11.00 | 10.94 | 10.89 | 10.83 | 10.78 | 10.72 | 10.67 | 10.61 |
| 11 | 11.67 | 11.61 | 11.56 | 11.50 | 11.44 | 11.39 | 11.33 | 11.28 | 11.22 | 11.17 |
| +10 | −12.22 | −12.17 | −12.11 | −12.06 | −12.00 | −11.94 | −11.89 | −11.83 | −11.78 | −11.72 |
| 9 | 12.78 | 12.72 | 12.67 | 12.61 | 12.56 | 12.50 | 12.44 | 12.39 | 12.33 | 12.28 |
| 8 | 13.33 | 13.28 | 13.22 | 13.17 | 13.11 | 13.06 | 13.00 | 12.94 | 12.89 | 12.83 |
| 7 | 13.89 | 13.83 | 13.78 | 13.72 | 13.67 | 13.61 | 13.56 | 13.50 | 13.44 | 13.39 |
| 6 | 14.44 | 14.39 | 14.33 | 14.28 | 14.22 | 14.17 | 14.11 | 14.06 | 14.00 | 13.94 |
| + 5 | −15.00 | −14.94 | −14.89 | −14.83 | −14.78 | −14.72 | −14.67 | −14.61 | −14.56 | −14.50 |
| 4 | 15.56 | 15.50 | 15.44 | 15.39 | 15.33 | 15.28 | 15.22 | 15.17 | 15.11 | 15.06 |
| 3 | 16.11 | 16.06 | 16.00 | 15.94 | 15.89 | 15.83 | 15.78 | 15.72 | 15.67 | 15.61 |
| 2 | 16.67 | 16.61 | 16.56 | 16.50 | 16.44 | 16.39 | 16.33 | 16.28 | 16.22 | 16.17 |
| 1 | 17.22 | 17.17 | 17.11 | 17.06 | 17.00 | 16.94 | 16.89 | 16.83 | 16.78 | 16.72 |
| + 0 | 17.78 | 17.72 | 17.67 | 17.61 | 17.56 | 17.50 | 17.44 | 17.39 | 17.33 | 17.28 |
| − 0 | −17.78 | −17.83 | −17.89 | −17.94 | −18.00 | −18.06 | −18.11 | −18.17 | −18.22 | −18.28 |
| 1 | 18.33 | 18.39 | 18.44 | 18.50 | 18.56 | 18.61 | 18.67 | 18.72 | 18.78 | 18.83 |
| 2 | 18.89 | 18.94 | 19.00 | 19.06 | 19.11 | 19.17 | 19.22 | 19.28 | 19.33 | 19.39 |
| 3 | 19.44 | 19.50 | 19.56 | 19.61 | 19.67 | 19.72 | 19.78 | 19.83 | 19.89 | 19.94 |
| 4 | 20.00 | 20.06 | 20.11 | 20.17 | 20.22 | 20.28 | 20.33 | 20.39 | 20.44 | 20.50 |
| − 5 | −20.56 | −20.61 | −20.67 | −20.72 | −20.78 | −20.83 | −20.89 | −20.94 | −21.00 | −21.06 |
| 6 | 21.11 | 21.17 | 21.22 | 21.28 | 21.33 | 21.39 | 21.44 | 21.50 | 21.56 | 21.61 |
| 7 | 21.67 | 21.72 | 21.78 | 21.83 | 21.89 | 21.94 | 22.00 | 22.06 | 22.11 | 22.17 |
| 8 | 22.22 | 22.28 | 22.33 | 22.39 | 22.44 | 22.50 | 22.56 | 22.61 | 22.67 | 22.72 |
| 9 | 22.78 | 22.83 | 22.89 | 22.94 | 23.00 | 23.06 | 23.11 | 23.17 | 23.22 | 23.28 |
| − 10 | −23.33 | −23.39 | −23.44 | −23.50 | −23.56 | −23.61 | −23.67 | −23.72 | −23.78 | −23.83 |
| 11 | 23.89 | 23.94 | 24.00 | 24.06 | 24.11 | 24.17 | 24.22 | 24.28 | 24.33 | 24.39 |
| 12 | 24.44 | 24.50 | 24.56 | 24.61 | 24.67 | 24.72 | 24.78 | 24.83 | 24.89 | 24.94 |
| 13 | 25.00 | 25.06 | 25.11 | 25.17 | 25.22 | 25.28 | 25.33 | 25.39 | 25.44 | 25.50 |
| 14 | 25.56 | 25.61 | 25.67 | 25.72 | 25.78 | 25.83 | 25.89 | 25.94 | 26.00 | 26.06 |
| − 15 | −26.11 | −26.17 | −26.22 | −26.28 | −26.33 | −26.39 | −26.44 | −26.50 | −26.56 | −26.61 |
| 16 | 26.67 | 26.72 | 26.78 | 26.83 | 26.89 | 26.94 | 27.00 | 27.06 | 27.11 | 27.17 |
| 17 | 27.22 | 27.28 | 27.33 | 27.39 | 27.44 | 27.50 | 27.56 | 27.61 | 27.67 | 27.72 |
| 18 | 27.78 | 27.83 | 27.89 | 27.94 | 28.00 | 28.06 | 28.11 | 28.17 | 28.22 | 28.28 |
| 19 | 28.33 | 28.39 | 28.44 | 28.50 | 28.56 | 28.61 | 28.67 | 28.72 | 28.78 | 28.83 |
| −20 | −28.89 | −28.94 | −29.00 | −29.06 | −29.11 | −29.17 | −29.22 | −29.28 | −29.33 | −29.39 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

TABLE 2.

## FAHRENHEIT SCALE TO CENTIGRADE.

| Fahrenheit. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| −20° | −28°.89 | −28°.94 | −29°.00 | 29°.06 | −29°.11 | −29°.17 | −29°.22 | −29°.28 | −29°.33 | −29°.39 |
| 21 | 29.44 | 29.50 | 29.56 | 29.61 | 29.67 | 29.72 | 29.78 | 29.83 | 29.89 | 29.94 |
| 22 | 30.00 | 30.06 | 30.11 | 30.17 | 30.22 | 30.28 | 30.33 | 30.39 | 30.44 | 30.50 |
| 23 | 30.56 | 30.61 | 30.67 | 30.72 | 30.78 | 30.83 | 30.89 | 30.94 | 31.00 | 31.06 |
| 24 | 31.11 | 31.17 | 31.22 | 31.28 | 31.33 | 31.39 | 31.44 | 31.50 | 31.56 | 31.61 |
| −25 | −31.67 | −31.72 | −31.78 | −31.83 | 31.89 | - 31.94 | −32.00 | −32.06 | −32.11 | −32.17 |
| 26 | 32.22 | 32.28 | 32.33 | 32.39 | 32.44 | 32.50 | 32.56 | 32.61 | 32.67 | 32.72 |
| 27 | 32.78 | 32.83 | 32.89 | 32.94 | 33.00 | 33.06 | 33.11 | 33.17 | 33.22 | 33.28 |
| 28 | 33.33 | 33.39 | 33.44 | 33.50 | 33.56 | 33.61 | 33.67 | 33.72 | 33.78 | 33.83 |
| 29 | 33.89 | 33.94 | 34.00 | 34.06 | 34.11 | 34.17 | 34.22 | 34.28 | 34.33 | 34.39 |
| −30 | −34.44 | −34.50 | −34.56 | −34.61 | −34.67 | −34.72 | −34.78 | −34.83 | −34.89 | −34.94 |
| 31 | 35.00 | 35.06 | 35.11 | 35.17 | 35.22 | 35.28 | 35.33 | 35.39 | 35.44 | 35.50 |
| 32 | 35.56 | 35.61 | 35.67 | 35.72 | 35.78 | 35.83 | 35.89 | 35.94 | 36.00 | 36.06 |
| 33 | 36.11 | 36.17 | 36.22 | 36.28 | 36.33 | 36.39 | 36.44 | 36.50 | 36.56 | 36.61 |
| 34 | 36.67 | 36.72 | 36.78 | 36.83 | 36.89 | 36.94 | 37.00 | 37.06 | 37.11 | 37.17 |
| −35 | −37.22 | −37.28 | −37.33 | −37.39 | −37.44 | −37.50 | −37.56 | −37.61 | −37.67 | −37.72 |
| 36 | 37.78 | 37.83 | 37.89 | 37.94 | 38.00 | 38.06 | 38.11 | 38.17 | 38.22 | 38.28 |
| 37 | 38.33 | 38.39 | 38.44 | 38.50 | 38.56 | 38.61 | 38.67 | 38.72 | 38.78 | 38.83 |
| 38 | 38.89 | 38.94 | 39.00 | 39.06 | 39.11 | 39.17 | 39.22 | 39.28 | 39.33 | 39.39 |
| 39 | 39.44 | 39.50 | 39.56 | 39.61 | 39.67 | 39.72 | 39.78 | 39.83 | 39.89 | 39.94 |
| −40 | −40.00 | −40.06 | −40.11 | −40.17 | −40.22 | −40.28 | −40.33 | −40.39 | −40.44 | −40.50 |
| 41 | 40.56 | 40.61 | 40.67 | 40.72 | 40.78 | 40.83 | 40.89 | 40.94 | 41.00 | 41.06 |
| 42 | 41.11 | 41.17 | 41.22 | 41.28 | 41.33 | 41.39 | 41.44 | 41.50 | 41.56 | 41.61 |
| 43 | 41.67 | 41.72 | 41.78 | 41.83 | 41.89 | 41.94 | 42.00 | 42.06 | 42.11 | 42.17 |
| 44 | 42.22 | 42.28 | 42.33 | 42.39 | 42.44 | 42.50 | 42.56 | 42.61 | 42.67 | 42.72 |
| −45 | −42.78 | −42.83 | −42.89 | −42.94 | −43.00 | −43.06 | −43.11 | −43.17 | −43.22 | −43.28 |
| 46 | 43.33 | 43.39 | 43.44 | 43.50 | 43.56 | 43.61 | 43.67 | 43.72 | 43.78 | 43.83 |
| 47 | 43.89 | 43.94 | 44.00 | 44.06 | 44.11 | 44.17 | 44.22 | 44.28 | 44.33 | 44.39 |
| 48 | 44.44 | 44.50 | 44.56 | 44.61 | 44.67 | 44.72 | 44.78 | 44.83 | 44.89 | 44.94 |
| 49 | 45.00 | 45.06 | 45.11 | 45.17 | 45.22 | 45.28 | 45.33 | 45.39 | 45.44 | 45.50 |
| −50 | −45.56 | −45.61 | −45.67 | −45.72 | −45.78 | −45.83 | −45.89 | −45.94 | −46.00 | −46.06 |
| 51 | 46.11 | 46.17 | 46.22 | 46.28 | 46.33 | 46.39 | 46.44 | 46.50 | 46.56 | 46.61 |
| 52 | 46.67 | 46.72 | 46.78 | 46.83 | 46.89 | 46.94 | 47.00 | 47.06 | 47.11 | 47.17 |
| 53 | 47.22 | 47.28 | 47.33 | 47.39 | 47.44 | 47.50 | 47.56 | 47.61 | 47.67 | 47.72 |
| 54 | 47.78 | 47.83 | 47.89 | 47.94 | 48.00 | 48.06 | 48.11 | 48.17 | 48.22 | 48.28 |
| −55 | −48.33 | −48.39 | −48.44 | −48.50 | −48.56 | −48.61 | −48.67 | −48.72 | −48.78 | −48.83 |
| 56 | 48.89 | 48.94 | 49.00 | 49.06 | 49.11 | 49.17 | 49.22 | 49.28 | 49.33 | 49.39 |
| 57 | 49.44 | 49.50 | 49.56 | 49.61 | 49.67 | 49.72 | 49.78 | 49.83 | 49.89 | 49.94 |
| 58 | 50.00 | 50.06 | 50.11 | 50.17 | 50.22 | 50.28 | 50.33 | 50.39 | 50.44 | 50.50 |
| 59 | 50.56 | 50.61 | 50.67 | 50.72 | 50.78 | 50.83 | 50.89 | 50.94 | 51.00 | 51.06 |
| −60 | −51.11 | −51.17 | −51.22 | −51.28 | −51.33 | −51.39 | −51.44 | −51.50 | −51.56 | −51.61 |
| 61 | 51.67 | 51.72 | 51.78 | 51.83 | 51.89 | 51.94 | 52.00 | 52.06 | 52.11 | 52.17 |
| 62 | 52.22 | 52.28 | 52.33 | 52.39 | 52.44 | 52.50 | 52.56 | 52.61 | 52.67 | 52.72 |
| 63 | 52.78 | 52.83 | 52.89 | 52.94 | 53.00 | 53.06 | 53.11 | 53.17 | 53.22 | 53.28 |
| 64 | 53.33 | 53.39 | 53.44 | 53.50 | 53.56 | 53.61 | 53.67 | 53.72 | 53.78 | 53.83 |
| −65 | −53.89 | −53.94 | −54.00 | −54.06 | −54.11 | −54.17 | −54.22 | −54.28 | −54.33 | −54.39 |
| 66 | 54.44 | 54.50 | 54.56 | 54.61 | 54.67 | 54.72 | 54.78 | 54.83 | 54.89 | 54.94 |
| 67 | 55.00 | 55.06 | 55.11 | 55.17 | 55.22 | 55.28 | 55.33 | 55.39 | 55.44 | 55.50 |
| 68 | 55.56 | 55.61 | 55.67 | 55.72 | 55.78 | 55.83 | 55.89 | 55.94 | 56.00 | 56.06 |
| 69 | 56.11 | 56.17 | 56.22 | 56.28 | 56.33 | 56.39 | 56.44 | 56.50 | 56.56 | 56.61 |
| −70 | −56.67 | −56.72 | −56.78 | −56.83 | −56.89 | −56.94 | −57.00 | −57.06 | −57.11 | −57.17 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

## FAHRENHEIT SCALE TO CENTIGRADE.

| Fahrenheit. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| −70° | −56°.67 | −56°.72 | −56°.78 | −56°.83 | −56°.89 | −56°.94 | −57°.00 | −57°.06 | −57°.11 | −57°.17 |
| 71 | 57.22 | 57.28 | 57.33 | 57.39 | 57.44 | 57.50 | 57.56 | 57.61 | 57.67 | 57.72 |
| 72 | 57.78 | 57.83 | 57.89 | 57.94 | 58.00 | 58.06 | 58.11 | 58.17 | 58.22 | 58.28 |
| 73 | 58.33 | 58.39 | 58.44 | 58.50 | 58.56 | 58.61 | 58.67 | 58.72 | 58.78 | 58.83 |
| 74 | 58.89 | 58.94 | 59.00 | 59.06 | 59.11 | 59.17 | 59.22 | 59.28 | 59.33 | 59.39 |
| −75 | −59.44 | −59.50 | −59.56 | −59.61 | −59.67 | −59.72 | −59.78 | −59.83 | −59.89 | −59.94 |
| 76 | 60.00 | 60.06 | 60.11 | 60.17 | 60.22 | 60.28 | 60.33 | 60.39 | 60.44 | 60.50 |
| 77 | 60.56 | 60.61 | 60.67 | 60.72 | 60.78 | 60.83 | 60.89 | 60.94 | 61.00 | 61.06 |
| 78 | 61.11 | 61.17 | 61.22 | 61.28 | 61.33 | 61.39 | 61.44 | 61.50 | 61.56 | 61.61 |
| 79 | 61.67 | 61.72 | 61.78 | 61.83 | 61.89 | 61.94 | 62.00 | 62.06 | 62.11 | 62.17 |
| −80 | −62.22 | −62.28 | −62.33 | −62.39 | −62.44 | −62.50 | −62.56 | −62.61 | −62.67 | −62.72 |
| 81 | 62.78 | 62.83 | 62.89 | 62.94 | 63.00 | 63.06 | 63.11 | 63.17 | 63.22 | 63.28 |
| 82 | 63.33 | 63.39 | 63.44 | 63.50 | 63.56 | 63.61 | 63.67 | 63.72 | 63.78 | 63.83 |
| 83 | 63.89 | 63.94 | 64.00 | 64.06 | 64.11 | 64.17 | 64.22 | 64.28 | 64.33 | 64.39 |
| 84 | 64.44 | 64.50 | 64.56 | 64.61 | 64.67 | 64.72 | 64.78 | 64.83 | 64.89 | 64.94 |
| −85 | −65.00 | −65.06 | −65.11 | −65.17 | −65.22 | −65.28 | −65.33 | −65.39 | −65.44 | −65.50 |
| 86 | 65.56 | 65.61 | 65.67 | 65.72 | 65.78 | 65.83 | 65.89 | 65.94 | 66.00 | 66.06 |
| 87 | 66.11 | 66.17 | 66.22 | 66.28 | 66.33 | 66.39 | 66.44 | 66.50 | 66.56 | 66.61 |
| 88 | 66.67 | 66.72 | 66.78 | 66.83 | 66.89 | 66.94 | 67.00 | 67.06 | 67.11 | 67.17 |
| 89 | 67.22 | 67.28 | 67.33 | 67.39 | 67.44 | 67.50 | 67.56 | 67.61 | 67.67 | 67.72 |
| −90 | −67.78 | −67.83 | −67.89 | −67.94 | −68.00 | −68.06 | −68.11 | −68.17 | −68.22 | −68.28 |
| 91 | 68.33 | 68.39 | 68.44 | 68.50 | 68.56 | 68.61 | 68.67 | 68.72 | 68.78 | 68.83 |
| 92 | 68.89 | 68.94 | 69.00 | 69.06 | 69.11 | 69.17 | 69.22 | 69.28 | 69.33 | 69.39 |
| 93 | 69.44 | 69.50 | 69.56 | 69.61 | 69.67 | 69.72 | 69.78 | 69.83 | 69.89 | 69.94 |
| 94 | 70.00 | 70.06 | 70.11 | 70.17 | 70.22 | 70.28 | 70.33 | 70.39 | 70.44 | 70.50 |
| −95 | −70.56 | −70.61 | −70.67 | −70.72 | −70.78 | −70.83 | −70.89 | −70.94 | −71.00 | −71.06 |
| 96 | 71.11 | 71.17 | 71.22 | 71.28 | 71.33 | 71.39 | 71.44 | 71.50 | 71.56 | 71.61 |
| 97 | 71.67 | 71.72 | 71.78 | 71.83 | 71.89 | 71.94 | 72.00 | 72.06 | 72.11 | 72.17 |
| 98 | 72.22 | 72.28 | 72.33 | 72.39 | 72.44 | 72.50 | 72.56 | 72.61 | 72.67 | 72.72 |
| 99 | 72.78 | 72.83 | 72.89 | 72.94 | 73.00 | 73.06 | 73.11 | 73.17 | 73.22 | 73.28 |
| −100 | −73.33 | −73.39 | −73.44 | −73.50 | −73.56 | −73.61 | −73.67 | −73.72 | −73.78 | −73.83 |
| 101 | 73.89 | 73.94 | 74.00 | 74.06 | 74.11 | 74.17 | 74.22 | 74.28 | 74.33 | 74.39 |
| 102 | 74.44 | 74.50 | 74.56 | 74.61 | 74.67 | 74.72 | 74.78 | 74.83 | 74.89 | 74.94 |
| 103 | 75.00 | 75.06 | 75.11 | 75.17 | 75.22 | 75.28 | 75.33 | 75.39 | 75.44 | 75.50 |
| 104 | 75.56 | 75.61 | 75.67 | 75.72 | 75.78 | 75.83 | 75.89 | 75.94 | 76.00 | 76.06 |
| −105 | −76.11 | −76.17 | −76.22 | −76.28 | −76.33 | −76.39 | −76.44 | −76.50 | −76.56 | −76.61 |
| 106 | 76.67 | 76.72 | 76.78 | 76.83 | 76.89 | 76.94 | 77.00 | 77.06 | 77.11 | 77.17 |
| 107 | 77.22 | 77.28 | 77.33 | 77.39 | 77.44 | 77.50 | 77.56 | 77.61 | 77.67 | 77.72 |
| 108 | 77.78 | 77.83 | 77.89 | 77.94 | 78.00 | 78.06 | 78.11 | 78.17 | 78.22 | 78.28 |
| 109 | 78.33 | 78.39 | 78.44 | 78.50 | 78.56 | 78.61 | 78.67 | 78.72 | 78.78 | 78.83 |
| −110 | −78.89 | −78.94 | −79.00 | −79.06 | −79.11 | −79.17 | −79.22 | −79.28 | −79.33 | −79.39 |
| 111 | 79.44 | 79.50 | 79.56 | 79.61 | 79.67 | 79.72 | 79.78 | 79.83 | 79.89 | 79.94 |
| 112 | 80.00 | 80.06 | 80.11 | 80.17 | 80.22 | 80.28 | 80.33 | 80.39 | 80.44 | 80.50 |
| 113 | 80.56 | 80.61 | 80.67 | 80.72 | 80.78 | 80.83 | 80.89 | 80.94 | 81.00 | 81.06 |
| 114 | 81.11 | 81.17 | 81.22 | 81.28 | 81.33 | 81.39 | 81.44 | 81.50 | 81.56 | 81.61 |
| −115 | −81.67 | −81.72 | −81.78 | −81.83 | −81.89 | −81.94 | −82.00 | −82.06 | −82.11 | −82.17 |
| 116 | 82.22 | 82.28 | 82.33 | 82.39 | 82.44 | 82.50 | 82.56 | 82.61 | 82.67 | 82.72 |
| 117 | 82.78 | 82.83 | 82.89 | 82.94 | 83.00 | 83.06 | 83.11 | 83.17 | 83.22 | 83.28 |
| 118 | 83.33 | 83.39 | 83.44 | 83.50 | 83.56 | 83.61 | 83.67 | 83.72 | 83.78 | 83.83 |
| 119 | 83.89 | 83.94 | 84.00 | 84.06 | 84.11 | 84.17 | 84.22 | 84.28 | 84.33 | 84.39 |
| −120 | −84.44 | −84.50 | −84.56 | −84.61 | −84.67 | −84.72 | −84.78 | −84.83 | −84.89 | −84.94 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

## CENTIGRADE SCALE TO FAHRENHEIT.

| Centigrade. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| +60° | +140°.00 | +140°.18 | +140°.36 | +140°.54 | +140°.72 | +140°.90 | +141°.08 | +141°.26 | +141°.44 | +141°.62 |
| 59 | 138.20 | 138.38 | 138.56 | 138.74 | 138.92 | 139.10 | 139.28 | 139.46 | 139.64 | 139.82 |
| 58 | 136.40 | 136.58 | 136.76 | 136.94 | 137.12 | 137.30 | 137.48 | 137.66 | 137.84 | 138.02 |
| 57 | 134.60 | 134.78 | 134.96 | 135.14 | 135.32 | 135.50 | 135.68 | 135.86 | 136.04 | 136.22 |
| 56 | 132.80 | 132.98 | 133.16 | 133.34 | 133.52 | 133.70 | 133.88 | 134.06 | 134.24 | 134.42 |
| +55 | +131.00 | +131.18 | +131.36 | +131.54 | +131.72 | +131.90 | +132.08 | +132.26 | +132.44 | +132.62 |
| 54 | 129.20 | 129.38 | 129.56 | 129.74 | 129.92 | 130.10 | 130.28 | 130.46 | 130.64 | 130.82 |
| 53 | 127.40 | 127.58 | 127.76 | 127.94 | 128.12 | 128.30 | 128.48 | 128.66 | 128.84 | 129.02 |
| 52 | 125.60 | 125.78 | 125.96 | 126.14 | 126.32 | 126.50 | 126.68 | 126.86 | 127.04 | 127.22 |
| 51 | 123.80 | 123.98 | 124.16 | 124.34 | 124.52 | 124.70 | 124.88 | 125.06 | 125.24 | 125.42 |
| +50 | +122.00 | +122.18 | +122.36 | +122.54 | +122.72 | +122.90 | +123.08 | +123.26 | +123.44 | +123.62 |
| 49 | 120.20 | 120.38 | 120.56 | 120.74 | 120.92 | 121.10 | 121.28 | 121.46 | 121.64 | 121.82 |
| 48 | 118.40 | 118.58 | 118.76 | 118.94 | 119.12 | 119.30 | 119.48 | 119.66 | 119.84 | 120.02 |
| 47 | 116.60 | 116.78 | 116.96 | 117.14 | 117.32 | 117.50 | 117.68 | 117.86 | 118.04 | 118.22 |
| 46 | 114.80 | 114 98 | 115.16 | 115.34 | 115.52 | 115.70 | 115.88 | 116.06 | 116.24 | 116.42 |
| +45 | +113.00 | +113.18 | +113.36 | +113.54 | +113.72 | +113.90 | +114.08 | +114.26 | +114.44 | +114.62 |
| 44 | 111.20 | 111.38 | 111.56 | 111.74 | 111.92 | 112.10 | 112.28 | 112.46 | 112.64 | 112.82 |
| 43 | 109.40 | 109.58 | 109.76 | 109.94 | 110.12 | 110.30 | 110.48 | 110.66 | 110.84 | 111.02 |
| 42 | 107.60 | 107.78 | 107.96 | 108.14 | 108.32 | 108.50 | 108.68 | 108.86 | 109.04 | 109.22 |
| 41 | 105.80 | 105.98 | 106.16 | 106.34 | 106.52 | 106.70 | 106.88 | 107.06 | 107.24 | 107.42 |
| +40 | +104.00 | +104.18 | +104.36 | +104.54 | +104.72 | +104.90 | +105.08 | +105.26 | +105.44 | +105.62 |
| 39 | 102.20 | 102.38 | 102.56 | 102.74 | 102.92 | 103.10 | 103.28 | 103.46 | 103.64 | 103.82 |
| 38 | 100.40 | 100.58 | 100.76 | 100.94 | 101.12 | 101.30 | 101.48 | 101.66 | 101.84 | 102.02 |
| 37 | 98.60 | 98.78 | 98.96 | 99.14 | 99.32 | 99.50 | 99.68 | 99.86 | 100.04 | 100.22 |
| 36 | 96.80 | 96.98 | 97.16 | 97.34 | 97.52 | 97.70 | 97.88 | 98.06 | 98.24 | 98.42 |
| +35 | + 95.00 | + 95.18 | + 95.36 | + 95.54 | + 95.72 | + 95.90 | + 96.08 | + 96.26 | + 96.44 | + 96.62 |
| 34 | 93.20 | 93.38 | 93.56 | 93.74 | 93.92 | 94.10 | 94.28 | 94.46 | 94.64 | 94.82 |
| 33 | 91.40 | 91.58 | 91.76 | 91.94 | 92.12 | 92.30 | 92.48 | 92.66 | 92.84 | 93.02 |
| 32 | 89.60 | 89.78 | 89.96 | 90.14 | 90.32 | 90.50 | 90.68 | 90.86 | 91.04 | 91.22 |
| 31 | 87.80 | 87.98 | 88.16 | 88.34 | 88.52 | 88.70 | 88.88 | 89.06 | 89.24 | 89.42 |
| +30 | + 86.00 | + 86.18 | + 86.36 | + 86.54 | + 86.72 | + 86.90 | + 87.08 | + 87.26 | + 87.44 | + 87.62 |
| 29 | 84.20 | 84.38 | 84.56 | 84.74 | 84.92 | 85.10 | 85.28 | 85.46 | 85.64 | 85.82 |
| 28 | 82.40 | 82.58 | 82.76 | 82.94 | 83.12 | 83.30 | 83.48 | 83.66 | 83.84 | 84.02 |
| 27 | 80.60 | 80.78 | 80.96 | 81.14 | 81.32 | 81.50 | 81.68 | 81.86 | 82.04 | 82.22 |
| 26 | 78.80 | 78.98 | 79.16 | 79.34 | 79.52 | 79.70 | 79.88 | 80.06 | 80.24 | 80.42 |
| +25 | + 77.00 | + 77.18 | + 77.36 | + 77.54 | + 77.72 | + 77.90 | + 78.08 | + 78.26 | + 78.44 | + 78.62 |
| 24 | 75.20 | 75.38 | 75.56 | 75.74 | 75.92 | 76.10 | 76.28 | 76.46 | 76.64 | 76.82 |
| 23 | 73.40 | 73.58 | 73.76 | 73.94 | 74.12 | 74.30 | 74.48 | 74.66 | 74.84 | 75.02 |
| 22 | 71.60 | 71.78 | 71.96 | 72.14 | 72.32 | 72.50 | 72.68 | 72.86 | 73.04 | 73.22 |
| 21 | 69.80 | 69.98 | 70.16 | 70.34 | 70.52 | 70.70 | 70.88 | 71.06 | 71.24 | 71.42 |
| +20 | + 68.00 | + 68.18 | + 68.36 | + 68.54 | + 68.72 | + 68.90 | + 69.08 | + 69.26 | + 69.44 | + 69.62 |
| 19 | 66.20 | 66.38 | 66.56 | 66.74 | 66.92 | 67.10 | 67.28 | 67.46 | 67.64 | 67.82 |
| 18 | 64.40 | 64.58 | 64.76 | 64.94 | 65.12 | 65.30 | 65.48 | 65.66 | 65.84 | 66.02 |
| 17 | 62.60 | 62.78 | 62.96 | 63.14 | 63.32 | 63.50 | 63.68 | 63.86 | 64.04 | 64.22 |
| 16 | 60.80 | 60.98 | 61.16 | 61.34 | 61.52 | 61.70 | 61.88 | 62.06 | 62.24 | 62.42 |
| +15 | + 59.00 | + 59.18 | + 59.36 | + 59.54 | + 59.72 | + 59.90 | + 60.08 | + 60.26 | + 60.44 | + 60.62 |
| 14 | 57.20 | 57.38 | 57.56 | 57.74 | 57.92 | 58.10 | 58.28 | 58.46 | 58.64 | 58.82 |
| 13 | 55.40 | 55.58 | 55.76 | 55.94 | 56.12 | 56.30 | 56.48 | 56.66 | 56.84 | 57.02 |
| 12 | 53.60 | 53.78 | 53.96 | 54.14 | 54.32 | 54.50 | 54.68 | 54.86 | 55.04 | 55.22 |
| 11 | 51.80 | 51.98 | 52.16 | 52.34 | 52.52 | 52.70 | 52.88 | 53.06 | 53.24 | 53.42 |
| +10 | + 50.00 | + 50.18 | + 50.36 | + 50.54 | + 50.72 | + 50.90 | + 51.08 | + 51.26 | + 51.44 | + 51.62 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

## CENTIGRADE SCALE TO FAHRENHEIT.

| Centigrade. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| +10° | +50°.00 | +50°.18 | +50°.36 | +50°.54 | +50°.72 | +50°.90 | +51°.08 | +51°.26 | +51°.44 | +51°.62 |
| + 9 | +48.20 | +48.38 | +48.56 | +48.74 | +48.92 | +49.10 | +49.28 | +49.46 | +49.64 | +49.82 |
| 8 | 46.40 | 46.58 | 46.76 | 46.94 | 47.12 | 47.30 | 47.48 | 47.66 | 47.84 | 48.02 |
| 7 | 44.60 | 44.78 | 44.96 | 45.14 | 45.32 | 45.50 | 45.68 | 45.86 | 46.04 | 46.22 |
| 6 | 42.80 | 42.98 | 43.16 | 43.34 | 43.52 | 43.70 | 43.88 | 44.06 | 44.24 | 44.42 |
| 5 | 41.00 | 41.18 | 41.36 | 41.54 | 41.72 | 41.90 | 42.08 | 42.26 | 42.44 | 42.62 |
| + 4 | +39.20 | +39.38 | +39.56 | +39.74 | +39.92 | +40.10 | +40.28 | +40.46 | +40.64 | +40.82 |
| 3 | 37.40 | 37.58 | 37.76 | 37.94 | 38.12 | 38.30 | 38.48 | 38.66 | 38.84 | 39.02 |
| 2 | 35.60 | 35.78 | 35.96 | 36.14 | 36.32 | 36.50 | 36.68 | 36.86 | 37.04 | 37.22 |
| 1 | 33.80 | 33.98 | 34.16 | 34.34 | 34.52 | 34.70 | 34.88 | 35.06 | 35.24 | 35.42 |
| + 0 | 32.00 | 32.18 | 32.36 | 32.54 | 32.72 | 32.90 | 33.08 | 33.26 | 33.44 | 33.62 |
| − 0 | +32.00 | +31.82 | +31.64 | +31.46 | +31.28 | +31.10 | +30.92 | +30.74 | +30.56 | +30.38 |
| 1 | 30.20 | 30.02 | 29.84 | 29.66 | 29.48 | 29.30 | 29.12 | 28.94 | 28.76 | 28.58 |
| 2 | 28.40 | 28.22 | 28.04 | 27.86 | 27.68 | 27.50 | 27.32 | 27.14 | 26.96 | 26.78 |
| 3 | 26.60 | 26.42 | 26.24 | 26.06 | 25.88 | 25.70 | 25.52 | 25.34 | 25.16 | 24.98 |
| 4 | 24.80 | 24.62 | 24.44 | 24.26 | 24.08 | 23.90 | 23.72 | 23.54 | 23.36 | 23.18 |
| − 5 | +23.00 | +22.82 | +22.64 | +22.46 | +22.28 | +22.10 | +21.92 | +21.74 | +21.56 | +21.38 |
| 6 | 21.20 | 21.02 | 20.84 | 20.66 | 20.48 | 20.30 | 20.12 | 19.94 | 19.76 | 19.58 |
| 7 | 19.40 | 19.22 | 19.04 | 18.86 | 18.68 | 18.50 | 18.32 | 18.14 | 17.96 | 17.78 |
| 8 | 17.60 | 17.42 | 17.24 | 17.06 | 16.88 | 16.70 | 16.52 | 16.34 | 16.16 | 15.98 |
| 9 | 15.80 | 15.62 | 15.44 | 15.26 | 15.08 | 14.90 | 14.72 | 14.54 | 14.36 | 14.18 |
| −10 | +14.00 | +13.82 | +13.64 | +13.46 | +13.28 | +13.10 | +12.92 | +12.74 | +12.56 | +12.38 |
| 11 | 12.20 | 12.02 | 11.84 | 11.66 | 11.48 | 11.30 | 11.12 | 10.94 | 10.76 | 10.58 |
| 12 | 10.40 | 10.22 | 10.04 | 9.86 | 9.68 | 9.50 | 9.32 | 9.14 | 8.96 | 8.78 |
| 13 | 8.60 | 8.42 | 8.24 | 8.06 | 7.88 | 7.70 | 7.52 | 7.34 | 7.16 | 6.98 |
| 14 | 6.80 | 6.62 | 6.44 | 6.26 | 6.08 | 5.90 | 5.72 | 5.54 | 5.36 | 5.18 |
| −15 | + 5.00 | + 4.82 | + 4.64 | + 4.46 | + 4.28 | + 4.10 | + 3.92 | + 3.74 | + 3.56 | + 3.38 |
| 16 | + 3.20 | + 3.02 | + 2.84 | + 2.66 | + 2.48 | + 2.30 | + 2.12 | + 1.94 | + 1.76 | + 1.58 |
| 17 | + 1.40 | + 1.22 | + 1.04 | + 0.86 | + 0.68 | + 0.50 | + 0.32 | + 0.14 | − 0.04 | − 0.22 |
| 18 | − 0.40 | − 0.58 | − 0.76 | − 0.94 | − 1.12 | − 1.30 | − 1.48 | − 1.66 | − 1.84 | − 2.02 |
| 19 | − 2.20 | − 2.38 | − 2.56 | − 2.74 | − 2.92 | − 3.10 | − 3.28 | − 3.46 | − 3.64 | − 3.82 |
| −20 | − 4.00 | − 4.18 | − 4.36 | − 4.54 | − 4.72 | − 4.90 | − 5.08 | − 5.26 | − 5.44 | − 5.62 |
| 21 | 5.80 | 5.98 | 6.16 | 6.34 | 6.52 | 6.70 | 6.88 | 7.06 | 7.24 | 7.42 |
| 22 | 7.60 | 7.78 | 7.96 | 8.14 | 8.32 | 8.50 | 8.68 | 8.86 | 9.04 | 9.22 |
| 23 | 9.40 | 9.58 | 9.76 | 9.94 | 10.12 | 10.30 | 10.48 | 10.66 | 10.84 | 11.02 |
| 24 | 11.20 | 11.38 | 11.56 | 11.74 | 11.92 | 12.10 | 12.28 | 12.46 | 12.64 | 12.82 |
| −25 | −13.00 | −13.18 | −13.36 | −13.54 | −13.72 | −13.90 | −14.08 | −14.26 | −14.44 | −14.62 |
| 26 | 14.80 | 14.98 | 15.16 | 15.34 | 15.52 | 15.70 | 15.88 | 16.06 | 16.24 | 16.42 |
| 27 | 16.60 | 16.78 | 16.96 | 17.14 | 17.32 | 17.50 | 17.68 | 17.86 | 18.04 | 18.22 |
| 28 | 18.40 | 18.58 | 18.76 | 18.94 | 19.12 | 19.30 | 19.48 | 19.66 | 19.84 | 20.02 |
| 29 | 20.20 | 20.38 | 20.56 | 20.74 | 20.92 | 21.10 | 21.28 | 21.46 | 21.64 | 21.82 |
| −30 | −22.00 | −22.18 | −22.36 | −22.54 | −22.72 | −22.90 | −23.08 | −23.26 | −23.44 | −23.62 |
| 31 | 23.80 | 23.98 | 24.16 | 24.34 | 24.52 | 24.70 | 24.88 | 25.06 | 25.24 | 25.42 |
| 32 | 25.60 | 25.78 | 25.96 | 26.14 | 26.32 | 26.50 | 26.68 | 26.86 | 27.04 | 27.22 |
| 33 | 27.40 | 27.58 | 27.76 | 27.94 | 28.12 | 28.30 | 28.48 | 28.66 | 28.84 | 29.02 |
| 34 | 29.20 | 29.38 | 29.56 | 29.74 | 29.92 | 30.10 | 30.28 | 30.46 | 30.64 | 30.82 |
| −35 | −31.00 | −31.18 | −31.36 | −31.54 | −31.72 | −31.90 | −32.08 | −32.26 | −32.44 | −32.62 |
| 36 | 32.80 | 32.98 | 33.16 | 33.34 | 33.52 | 33.70 | 33.88 | 34.06 | 34.24 | 34.42 |
| 37 | 34.60 | 34.78 | 34.96 | 35.14 | 35.32 | 35.50 | 35.68 | 35.86 | 36.04 | 36.22 |
| 38 | 36.40 | 36.58 | 36.76 | 36.94 | 37.12 | 37.30 | 37.48 | 37.66 | 37.84 | 38.02 |
| 39 | 38.20 | 38.38 | 38.56 | 38.74 | 38.92 | 39.10 | 39.28 | 39.46 | 39.64 | 39.82 |
| −40 | −40.00 | −40.18 | −40.36 | −40.54 | −40.72 | −40.90 | −41.08 | −41.26 | −41.44 | −41.62 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

## CENTIGRADE SCALE TO FAHRENHEIT.

| Centigrade. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| −40° | −40.00 | −40.18 | −40.36 | −40.54 | −40.72 | −40.90 | −41.08 | −41.26 | −41.44 | −41.62 |
| 41 | 41.80 | 41.98 | 42.16 | 42.34 | 42.52 | 42.70 | 42.88 | 43.06 | 43.24 | 43.42 |
| 42 | 43.60 | 43.78 | 43.96 | 44.14 | 44.32 | 44.50 | 44.68 | 44.86 | 45.04 | 45.22 |
| 43 | 45.40 | 45.58 | 45.76 | 45.94 | 46.12 | 46.30 | 46.48 | 46.66 | 46.84 | 47.02 |
| 44 | 47.20 | 47.38 | 47.56 | 47.74 | 47.92 | 48.10 | 48.28 | 48.46 | 48.64 | 48.82 |
| −45 | −49.00 | −49.18 | −49.36 | −49.54 | −49.72 | −49.90 | −50.08 | −50.26 | −50.44 | −50.62 |
| 46 | 50.80 | 50.98 | 51.16 | 51.34 | 51.52 | 51.70 | 51.88 | 52.06 | 52.24 | 52.42 |
| 47 | 52.60 | 52.78 | 52.96 | 53.14 | 53.32 | 53.50 | 53.68 | 53.86 | 54.04 | 54.22 |
| 48 | 54.40 | 54.58 | 54.76 | 54.94 | 55.12 | 55.30 | 55.48 | 55.66 | 55.84 | 56.02 |
| 49 | 56.20 | 56.38 | 56.56 | 56.74 | 56.92 | 57.10 | 57.28 | 57.46 | 57.64 | 57.82 |
| −50 | −58.00 | −58.18 | −58.36 | −58.54 | −58.72 | −58.90 | −59.08 | −59.26 | −59.44 | −59.62 |
| 51 | 59.80 | 59.98 | 60.16 | 60.34 | 60.52 | 60.70 | 60.88 | 61.06 | 61.24 | 61.42 |
| 52 | 61.60 | 61.78 | 61.96 | 62.14 | 62.32 | 62.50 | 62.68 | 62.86 | 63.04 | 63.22 |
| 53 | 63.40 | 63.58 | 63.76 | 63.94 | 64.12 | 64.30 | 64.48 | 64.66 | 64.84 | 65.02 |
| 54 | 65.20 | 65.38 | 65.56 | 65.74 | 65.92 | 66.10 | 66.28 | 66.46 | 66.64 | 66.82 |
| −55 | −67.00 | −67.18 | −67.36 | −67.54 | −67.72 | −67.90 | −68.08 | −68.26 | −68.44 | −68.62 |
| 56 | 68.80 | 68.98 | 69.16 | 69.34 | 69.52 | 69.70 | 69.88 | 70.06 | 70.24 | 70.42 |
| 57 | 70.60 | 70.78 | 70.96 | 71.14 | 71.32 | 71.50 | 71.68 | 71.86 | 72.04 | 72.22 |
| 58 | 72.40 | 72.58 | 72.76 | 72.94 | 73.12 | 73.30 | 73.48 | 73.66 | 73.84 | 74.02 |
| 59 | 74.20 | 74.38 | 74.56 | 74.74 | 74.92 | 75.10 | 75.28 | 75.46 | 75.64 | 75.82 |
| −60 | −76.00 | −76.18 | −76.36 | −76.54 | −76.72 | −76.90 | −77.08 | −77.26 | −77.44 | −77.62 |
| 61 | 77.80 | 77.98 | 78.16 | 78.34 | 78.52 | 78.70 | 78.88 | 79.06 | 79.24 | 79.42 |
| 62 | 79.60 | 79.78 | 79.96 | 80.14 | 80.32 | 80.50 | 80.68 | 80.86 | 81.04 | 81.22 |
| 63 | 81.40 | 81.58 | 81.76 | 81.94 | 82.12 | 82.30 | 82.48 | 82.66 | 82.84 | 83.02 |
| 64 | 83.20 | 83.38 | 83.56 | 83.74 | 83.92 | 84.10 | 84.28 | 84.46 | 84.64 | 84.82 |
| −65 | −85.00 | −85.18 | −85.36 | −85.54 | −85.72 | −85.90 | −86.08 | −86.26 | −86.44 | −86.62 |
| 66 | 86.80 | 86.98 | 87.16 | 87.34 | 87.52 | 87.70 | 87.88 | 88.06 | 88.24 | 88.42 |
| 67 | 88.60 | 88.78 | 88.96 | 89.14 | 89.32 | 89.50 | 89.68 | 89.86 | 90.04 | 90.22 |
| 68 | 90.40 | 90.58 | 90.76 | 90.94 | 91.12 | 91.30 | 91.48 | 91.66 | 91.84 | 92.02 |
| 69 | 92.20 | 92.38 | 92.56 | 92.74 | 92.92 | 93.10 | 93.28 | 93.46 | 93.64 | 93.82 |
| −70 | −94.00 | −94.18 | −94.36 | −94.54 | −94.72 | −94.90 | −95.08 | −95.26 | −95.44 | −95.62 |
| 71 | 95.80 | 95.98 | 96.16 | 96.34 | 96.52 | 96.70 | 96.88 | 97.06 | 97.24 | 97.42 |
| 72 | 97.60 | 97.78 | 97.96 | 98.14 | 98.32 | 98.50 | 98.68 | 98.86 | 99.04 | 99.22 |
| 73 | 99.40 | 99.58 | 99.76 | 99.94 | 100.12 | 100.30 | 100.48 | 100.66 | 100.84 | 101.02 |
| 74 | 101.20 | 101.38 | 101.56 | 101.74 | 101.92 | 102.10 | 102.28 | 102.46 | 102.64 | 102.82 |
| −75 | −103.00 | −103.18 | −103.36 | −103.54 | −103.72 | −103.90 | −104.08 | −104.26 | −104.44 | −104.62 |
| 76 | 104.80 | 104.98 | 105.16 | 105.34 | 105.52 | 105.70 | 105.88 | 106.06 | 106.24 | 106.42 |
| 77 | 106.60 | 106.78 | 106.96 | 107.14 | 107.32 | 107.50 | 107.68 | 107.86 | 108.04 | 108.22 |
| 78 | 108.40 | 108.58 | 108.76 | 108.94 | 109.12 | 109.30 | 109.48 | 109.66 | 109.84 | 110.02 |
| 79 | 110.20 | 110.38 | 110.56 | 110.74 | 110.92 | 111.10 | 111.28 | 111.46 | 111.64 | 111.82 |
| −80 | −112.00 | −112.18 | −112.36 | −112.54 | −112.72 | −112.90 | −113.08 | −113.26 | −113.44 | −113.62 |
| 81 | 113.80 | 113.98 | 114.16 | 114.34 | 114.52 | 114.70 | 114.88 | 115.06 | 115.24 | 115.42 |
| 82 | 115.60 | 115.78 | 115.96 | 116.14 | 116.32 | 116.50 | 116.68 | 116.86 | 117.04 | 117.22 |
| 83 | 117.40 | 117.58 | 117.76 | 117.94 | 118.12 | 118.30 | 118.48 | 118.66 | 118.84 | 119.02 |
| 84 | 119.20 | 119.38 | 119.56 | 119.74 | 119.92 | 120.10 | 120.28 | 120.46 | 120.64 | 120.82 |
| −85 | −121.00 | −121.18 | −121.36 | −121.54 | −121.72 | −121.90 | −122.08 | −122.26 | −132.44 | −122.62 |
| 86 | 122.80 | 122.98 | 123.16 | 123.34 | 123.52 | 123.70 | 123.88 | 124.06 | 124.24 | 124.42 |
| 87 | 124.60 | 124.78 | 124.96 | 125.14 | 125.32 | 125.50 | 125.68 | 125.86 | 126.04 | 126.22 |
| 88 | 126.40 | 126.58 | 126.76 | 126.94 | 127.12 | 127.30 | 127.48 | 127.66 | 127.84 | 128.02 |
| 89 | 128.20 | 128.38 | 128.56 | 128.74 | 128.92 | 129.10 | 129.28 | 129.46 | 129.64 | 129.82 |
| −90 | −130.00 | −130.18 | −130.36 | −130.54 | −130.72 | −130.90 | −131.08 | −131.26 | −131.44 | −131.62 |
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |

TABLE 4.

## CENTIGRADE SCALE TO FAHRENHEIT—Near the Boiling Point.

| Centigrade. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| 100° | 212°.00 | 212°.18 | 212°.36 | 212°.54 | 212°.72 | 212°.90 | 213°.08 | 213°.26 | 213°.44 | 213°.62 |
| 99 | 210.20 | 210.38 | 210.56 | 210.74 | 210.92 | 211.10 | 211.28 | 211.46 | 211.64 | 211.82 |
| 98 | 208.40 | 208.58 | 208.76 | 208.94 | 209.12 | 209.30 | 209.48 | 209.66 | 209.84 | 210.02 |
| 97 | 206.60 | 206.78 | 206.96 | 207.14 | 207.32 | 207.50 | 207.68 | 207.86 | 208.04 | 208.22 |
| 96 | 204.80 | 204.98 | 205.16 | 205.34 | 205.52 | 205.70 | 205.88 | 206.06 | 206.24 | 206.42 |
| 95 | 203.00 | 203.18 | 203.36 | 203.54 | 203.72 | 203.90 | 204.08 | 204.26 | 204.44 | 204.62 |
| 94 | 201.20 | 201.38 | 201.56 | 201.74 | 201.92 | 202.10 | 202.28 | 202.46 | 202.64 | 202.82 |
| 93 | 199.40 | 199.58 | 199.76 | 199.94 | 200.12 | 200.30 | 200.48 | 200.66 | 200.84 | 201.02 |
| 92 | 197.60 | 197.78 | 197.96 | 198.14 | 198.32 | 198.50 | 198.68 | 198.86 | 199.04 | 199.22 |
| 91 | 195.80 | 195.98 | 196.16 | 196.34 | 196.52 | 196.70 | 196.88 | 197.06 | 197.24 | 197.42 |
| 90 | 194.00 | 194.18 | 194.36 | 194.54 | 194.72 | 194.90 | 195.08 | 195.26 | 195.44 | 195.62 |

TABLE 5.

## DIFFERENCES FAHRENHEIT TO DIFFERENCES CENTIGRADE.

| Fahrenheit. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| 0° | 0°.00 | 0°.06 | 0°.11 | 0°.17 | 0°.22 | 0°.28 | 0°.33 | 0°.39 | 0°.44 | 0°.50 |
| 1 | 0.56 | 0.61 | 0.67 | 0.72 | 0.78 | 0.83 | 0.89 | 0.94 | 1.00 | 1.06 |
| 2 | 1.11 | 1.17 | 1.22 | 1.28 | 1.33 | 1.39 | 1.44 | 1.50 | 1.56 | 1.61 |
| 3 | 1.67 | 1.72 | 1.78 | 1.83 | 1.89 | 1.94 | 2.00 | 2.06 | 2.11 | 2.17 |
| 4 | 2.22 | 2.28 | 2.33 | 2.39 | 2.44 | 2.50 | 2.56 | 2.61 | 2.67 | 2.72 |
| 5 | 2.78 | 2.83 | 2.89 | 2.94 | 3.00 | 3.06 | 3.11 | 3.17 | 3.22 | 3.28 |
| 6 | 3.33 | 3.39 | 3.44 | 3.50 | 3.56 | 3.61 | 3.67 | 3.72 | 3.78 | 3.83 |
| 7 | 3.89 | 3.94 | 4.00 | 4.06 | 4.11 | 4.17 | 4.22 | 4.28 | 4.33 | 4.39 |
| 8 | 4.44 | 4.50 | 4.56 | 4.61 | 4.67 | 4.72 | 4.78 | 4.83 | 4.89 | 4.94 |
| 9 | 5.00 | 5.06 | 5.11 | 5.17 | 5.22 | 5.28 | 5.33 | 5.39 | 5.44 | 5.50 |
| 10 | 5.56 | 5.61 | 5.67 | 5.72 | 5.78 | 5.83 | 5.89 | 5.94 | 6.00 | 6.06 |
| 11 | 6.11 | 6.17 | 6.22 | 6.28 | 6.33 | 6.39 | 6.44 | 6.50 | 6.56 | 6.61 |
| 12 | 6.67 | 6.72 | 6.78 | 6.83 | 6.89 | 6.94 | 7.00 | 7.06 | 7.11 | 7.17 |
| 13 | 7.22 | 7.28 | 7.33 | 7.39 | 7.44 | 7.50 | 7.56 | 7.61 | 7.67 | 7.72 |
| 14 | 7.78 | 7.83 | 7.89 | 7.94 | 8.00 | 8.06 | 8.11 | 8.17 | 8.22 | 8.28 |
| 15 | 8.33 | 8.39 | 8.44 | 8.50 | 8.56 | 8.61 | 8.67 | 8.72 | 8.78 | 8.83 |
| 16 | 8.89 | 8.94 | 9.00 | 9.06 | 9.11 | 9.17 | 9.22 | 9.28 | 9.33 | 9.39 |
| 17 | 9.44 | 9.50 | 9.56 | 9.61 | 9.67 | 9.72 | 9.78 | 9.83 | 9.89 | 9.94 |
| 18 | 10.00 | 10.06 | 10.11 | 10.17 | 10.22 | 10.28 | 10.33 | 10.39 | 10.44 | 10.50 |
| 19 | 10.56 | 10.61 | 10.67 | 10.72 | 10.78 | 10.83 | 10.89 | 10.94 | 11.00 | 11.06 |
| 20 | 11.11 | 11.17 | 11.22 | 11.28 | 11.33 | 11.39 | 11.44 | 11.50 | 11.56 | 11.61 |

TABLE 6.

## DIFFERENCES CENTIGRADE TO DIFFERENCES FAHRENHEIT.

| Centigrade. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| 0° | 0°.00 | 0°.18 | 0°.36 | 0°.54 | 0°.72 | 0°.90 | 1°.08 | 1°.26 | 1°.44 | 1°.62 |
| 1 | 1.80 | 1.98 | 2.16 | 2.34 | 2.52 | 2.70 | 2.88 | 3.06 | 3.24 | 3.42 |
| 2 | 3.60 | 3.78 | 3.96 | 4.14 | 4.32 | 4.50 | 4.68 | 4.86 | 5.04 | 5.22 |
| 3 | 5.40 | 5.58 | 5.76 | 5.94 | 6.12 | 6.30 | 6.48 | 6.66 | 6.84 | 7.02 |
| 4 | 7.20 | 7.38 | 7.56 | 7.74 | 7.92 | 8.10 | 8.28 | 8.46 | 8.64 | 8.82 |
| 5 | 9.00 | 9.18 | 9.36 | 9.54 | 9.72 | 9.90 | 10.08 | 10.26 | 10.44 | 10.62 |
| 6 | 10.80 | 10.98 | 11.16 | 11.34 | 11.52 | 11.70 | 11.88 | 12.06 | 12.24 | 12.42 |
| 7 | 12.60 | 12.78 | 12.96 | 13.14 | 13.32 | 13.50 | 13.68 | 13.86 | 14.04 | 14.22 |
| 8 | 14.40 | 14.58 | 14.76 | 14.94 | 15.12 | 15.30 | 15.48 | 15.66 | 15.84 | 16.02 |
| 9 | 16.20 | 16.38 | 16.56 | 16.74 | 16.92 | 17.10 | 17.28 | 17.46 | 17.64 | 17.82 |

## CORRECTION FOR THE TEMPERATURE OF THE EMERGENT MERCURIAL COLUMN OF THERMOMETERS.

$T = t - 0.000086\, n(t' - t)$ — Fahrenheit temperatures.
$T = t - 0.000155\, n(t' - t)$ — Centigrade temperatures.
$T$ = Corrected temperature.
$t$ = Observed temperature.
$t'$ = Mean temperature of the glass stem and emergent mercury column.
$n$ = Length of mercury in the emergent stem in scale degrees.

When $t'$ is $\left\{\frac{\text{higher}}{\textit{lower}}\right\}$ than $t$ the numerical correction is to be $\left\{\frac{\text{subtracted.}}{\textit{added.}}\right\}$

Table 7.

### CORRECTION FOR FAHRENHEIT THERMOMETERS.

Values of $0.000086\, n(t' - t)$

| $n$ | $t' - t$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | 100° |
| F. | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| 10° | 0.°01 | 0.°02 | 0.°03 | 0.°03 | 0.°04 | 0.°05 | 0.°06 | 0.°07 | 0.°08 | 0.°09 |
| 20 | 0.02 | 0.03 | 0.05 | 0.07 | 0.09 | 0.10 | 0.12 | 0.14 | 0.15 | 0.17 |
| 30 | 0.03 | 0.05 | 0.08 | 0.10 | 0.13 | 0.15 | 0.18 | 0.21 | 0.23 | 0.26 |
| 40 | 0.03 | 0.07 | 0.10 | 0.14 | 0.17 | 0.21 | 0.24 | 0.28 | 0.31 | 0.34 |
| 50 | 0.04 | 0.09 | 0.13 | 0.17 | 0.22 | 0.26 | 0.30 | 0.34 | 0.39 | 0.43 |
| 60 | 0.05 | 0.10 | 0.15 | 0.21 | 0.26 | 0.31 | 0.36 | 0.41 | 0.46 | 0.52 |
| 70 | 0.06 | 0.12 | 0.18 | 0.24 | 0.30 | 0.36 | 0.42 | 0.48 | 0.54 | 0.60 |
| 80 | 0.07 | 0.14 | 0.21 | 0.28 | 0.34 | 0.41 | 0.48 | 0.55 | 0.62 | 0.69 |
| 90 | 0.08 | 0.15 | 0.23 | 0.31 | 0.39 | 0.46 | 0.54 | 0.62 | 0.70 | 0.77 |
| 100 | 0.09 | 0.17 | 0.26 | 0.34 | 0.43 | 0.52 | 0.60 | 0.69 | 0.77 | 0.86 |
| 110 | 0.09 | 0.19 | 0.28 | 0.38 | 0.47 | 0.57 | 0.66 | 0.76 | 0.85 | 0.95 |
| 120 | 0.10 | 0.21 | 0.31 | 0.41 | 0.52 | 0.62 | 0.72 | 0.83 | 0.93 | 1.03 |
| 130 | 0.11 | 0.22 | 0.34 | 0.45 | 0.56 | 0.67 | 0.78 | 0.90 | 1.01 | 1.12 |

Table 8.

### CORRECTION FOR CENTIGRADE THERMOMETERS.

Values of $0.000155\, n(t' - t)$

| $n$ | $t' - t$ | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° |
| C. | C. | C. | C. | C. | C. | C. | C. | C. |
| 10° | 0.°02 | 0.°03 | 0.°05 | 0.°06 | 0.°08 | 0.°09 | 0.°11 | 0.°12 |
| 20 | 0.03 | 0.06 | 0.09 | 0.12 | 0.16 | 0.19 | 0.22 | 0.25 |
| 30 | 0.05 | 0.09 | 0.14 | 0.19 | 0.23 | 0.28 | 0.33 | 0.37 |
| 40 | 0.06 | 0.12 | 0.19 | 0.25 | 0.31 | 0.37 | 0.43 | 0.50 |
| 50 | 0.08 | 0.16 | 0.23 | 0.31 | 0.39 | 0.46 | 0.54 | 0.62 |
| 60 | 0.09 | 0.19 | 0.28 | 0.37 | 0.46 | 0.56 | 0.65 | 0.74 |
| 70 | 0.11 | 0.22 | 0.33 | 0.43 | 0.54 | 0.65 | 0.76 | 0.87 |
| 80 | 0.12 | 0.25 | 0.37 | 0.50 | 0.62 | 0.74 | 0.87 | 0.99 |
| 90 | 0.14 | 0.28 | 0.42 | 0.56 | 0.70 | 0.84 | 0.98 | 1.12 |
| 100 | 0.16 | 0.31 | 0.46 | 0.62 | 0.78 | 0.93 | 1.08 | 1.24 |

## CONVERSIONS INVOLVING LINEAR MEASURES.


Inches into millimeters . . . . . . . . . . . . . . Table 9

Millimeters into inches . . . . . . . . . . . . . . Table 10

Barometric inches into millibars . . . . . . . . . . Table 11

Barometric millimeters into millibars . . . . . . . . Table 12

Feet into meters . . . . . . . . . . . . . . . . Table 13

Meters into feet . . . . . . . . . . . . . . . . Table 14

Miles into kilometers . . . . . . . . . . . . . . Table 15

Kilometers into miles . . . . . . . . . . . . . . Table 16

Interconversion of nautical and statute miles . . . . . . Table 17

Continental measures of length with their metric and English equivalents . . . . . . . . . . . . . . . . Table 18

## INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **0.00** | 0.00 | 0.25 | 0.51 | 0.76 | 1.02 | 1.27 | 1.52 | 1.78 | 2.03 | 2.29 |
| 0.10 | 2.54 | 2.79 | 3.05 | 3.30 | 3.56 | 3.81 | 4.06 | 4.32 | 4.57 | 4.83 |
| 0.20 | 5.08 | 5.33 | 5.59 | 5.84 | 6.10 | 6.35 | 6.60 | 6.86 | 7.11 | 7.37 |
| 0.30 | 7.62 | 7.87 | 8.13 | 8.38 | 8.64 | 8.89 | 9.14 | 9.40 | 9.65 | 9.91 |
| 0.40 | 10.16 | 10.41 | 10.67 | 10.92 | 11.18 | 11.43 | 11.68 | 11.94 | 12.19 | 12.45 |
| **0.50** | 12.70 | 12.95 | 13.21 | 13.46 | 13.72 | 13.97 | 14.22 | 14.48 | 14.73 | 14.99 |
| 0.60 | 15.24 | 15.49 | 15.75 | 16.00 | 16.26 | 16.51 | 16.76 | 17.02 | 17.27 | 17.53 |
| 0.70 | 17.78 | 18.03 | 18.29 | 18.54 | 18.80 | 19.05 | 19.30 | 19.56 | 19.81 | 20.07 |
| 0.80 | 20.32 | 20.57 | 20.83 | 21.08 | 21.34 | 21.59 | 21.84 | 22.10 | 22.35 | 22.61 |
| 0.90 | 22.86 | 23.11 | 23.37 | 23.62 | 23.88 | 24.13 | 24.38 | 24.64 | 24.89 | 25.15 |
| **1.00** | 25.40 | 25.65 | 25.91 | 26.16 | 26.42 | 26.67 | 26.92 | 27.18 | 27.43 | 27.69 |
| 1.10 | 27.94 | 28.19 | 28.45 | 28.70 | 28.96 | 29.21 | 29.46 | 29.72 | 29.97 | 30.23 |
| 1.20 | 30.48 | 30.73 | 30.99 | 31.24 | 31.50 | 31.75 | 32.00 | 32.26 | 32.51 | 32.77 |
| 1.30 | 33.02 | 33.27 | 33.53 | 33.78 | 34.04 | 34.29 | 34.54 | 34.80 | 35.05 | 35.31 |
| 1.40 | 35.56 | 35.81 | 36.07 | 36.32 | 36.58 | 36.83 | 37.08 | 37.34 | 37.59 | 37.85 |
| **1.50** | 38.10 | 38.35 | 38.61 | 38.86 | 39.12 | 39.37 | 39.62 | 39.88 | 40.13 | 40.39 |
| 1.60 | 40.64 | 40.89 | 41.15 | 41.40 | 41.66 | 41.91 | 42.16 | 42.42 | 42.67 | 42.93 |
| 1.70 | 43.18 | 43.43 | 43.69 | 43.94 | 44.20 | 44.45 | 44.70 | 44.96 | 45.21 | 45.47 |
| 1.80 | 45.72 | 45.97 | 46.23 | 46.48 | 46.74 | 46.99 | 47.24 | 47.50 | 47.75 | 48.01 |
| 1.90 | 48.26 | 48.51 | 48.77 | 49.02 | 49.28 | 49.53 | 49.78 | 50.04 | 50.29 | 50.55 |
| **2.00** | 50.80 | 51.05 | 51.31 | 51.56 | 51.82 | 52.07 | 52.32 | 52.58 | 52.83 | 53.09 |
| 2.10 | 53.34 | 53.59 | 53.85 | 54.10 | 54.36 | 54.61 | 54.86 | 55.12 | 55.37 | 55.63 |
| 2.20 | 55.88 | 56.13 | 56.39 | 56.64 | 56.90 | 57.15 | 57.40 | 57.66 | 57.91 | 58.17 |
| 2.30 | 58.42 | 58.67 | 58.93 | 59.18 | 59.44 | 59.69 | 59.94 | 60.20 | 60.45 | 60.71 |
| 2.40 | 60.96 | 61.21 | 61.47 | 61.72 | 61.98 | 62.23 | 62.48 | 62.74 | 62.99 | 63.25 |
| **2.50** | 63.50 | 63.75 | 64.01 | 64.26 | 64.52 | 64.77 | 65.02 | 65.28 | 65.53 | 65.79 |
| 2.60 | 66.04 | 66.29 | 66.55 | 66.80 | 67.06 | 67.31 | 67.56 | 67.82 | 68.07 | 68.33 |
| 2.70 | 68.58 | 68.83 | 69.09 | 69.34 | 69.60 | 69.85 | 70.10 | 70.36 | 70.61 | 70.87 |
| 2.80 | 71.12 | 71.37 | 71.63 | 71.88 | 72.14 | 72.39 | 72.64 | 72.90 | 73.15 | 73.41 |
| 2.90 | 73.66 | 73.91 | 74.17 | 74.42 | 74.68 | 74.93 | 75.18 | 75.44 | 75.69 | 75.95 |
| **3.00** | 76.20 | 76.45 | 76.71 | 76.96 | 77.22 | 77.47 | 77.72 | 77.98 | 78.23 | 78.49 |
| 3.10 | 78.74 | 78.99 | 79.25 | 79.50 | 79.76 | 80.01 | 80.26 | 80.52 | 80.77 | 81.03 |
| 3.20 | 81.28 | 81.53 | 81.79 | 82.04 | 82.30 | 82.55 | 82.80 | 83.06 | 83.31 | 83.57 |
| 3.30 | 83.82 | 84.07 | 84.33 | 84.59 | 84.84 | 85.09 | 85.34 | 85.60 | 85.85 | 86.11 |
| 3.40 | 86.36 | 86.61 | 86.87 | 87.12 | 87.38 | 87.63 | 87.88 | 88.14 | 88.39 | 88.65 |
| **3.50** | 88.90 | 89.15 | 89.41 | 89.66 | 89.92 | 90.17 | 90.42 | 90.68 | 90.93 | 91.19 |
| 3.60 | 91.44 | 91.69 | 91.95 | 92.20 | 92.46 | 92.71 | 92.96 | 93.22 | 93.47 | 93.73 |
| 3.70 | 93.98 | 94.23 | 94.49 | 94.74 | 95.00 | 95.25 | 95.50 | 95.76 | 96.01 | 96.27 |
| 3.80 | 96.52 | 96.77 | 97.03 | 97.28 | 97.54 | 97.79 | 98.04 | 98.30 | 98.55 | 98.81 |
| 3.90 | 99.06 | 99.31 | 99.57 | 99.82 | 100.08 | 100.33 | 100.58 | 100.84 | 101.09 | 101.35 |
| **4.00** | 101.60 | 101.85 | 102.11 | 102.36 | 102.62 | 102.87 | 103.12 | 103.38 | 103.63 | 103.89 |
| 4.10 | 104.14 | 104.39 | 104.65 | 104.90 | 105.16 | 105.41 | 105.66 | 105.92 | 106.17 | 106.43 |
| 4.20 | 106.68 | 106.93 | 107.19 | 107.44 | 107.70 | 107.95 | 108.20 | 108.46 | 108.71 | 108.97 |
| 4.30 | 109.22 | 109.47 | 109.73 | 109.98 | 110.24 | 110.49 | 110.74 | 111.00 | 111.25 | 111.51 |
| 4.40 | 111.76 | 112.01 | 112.27 | 112.52 | 112.78 | 113.03 | 113.28 | 113.54 | 113.79 | 114.05 |
| **4.50** | 114.30 | 114.55 | 114.81 | 115.06 | 115.32 | 115.57 | 115.82 | 116.08 | 116.33 | 116.59 |
| 4.60 | 116.84 | 117.09 | 117.35 | 117.60 | 117.86 | 118.11 | 118.36 | 118.62 | 118.87 | 119.13 |
| 4.70 | 119.38 | 119.63 | 119.89 | 120.14 | 120.40 | 120.65 | 120.90 | 121.16 | 121.41 | 121.67 |
| 4.80 | 121.92 | 122.17 | 122.43 | 122.68 | 122.94 | 123.19 | 123.44 | 123.70 | 123.95 | 124.21 |
| 4.90 | 124.46 | 124.71 | 124.97 | 125.22 | 125.48 | 125.73 | 125.98 | 126.24 | 126.49 | 126.75 |
| **5.00** | 127.00 | 127.25 | 127.51 | 127.76 | 128.02 | 128.27 | 128.52 | 128.78 | 129.03 | 129.29 |

| Proportional Parts. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
| | mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 |

## INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **5.00** | 127.00 | 127.25 | 127.51 | 127.76 | 128.02 | 128.27 | 128.52 | 128.78 | 129.03 | 129.29 |
| 5.10 | 129.54 | 129.79 | 130.05 | 130.30 | 130.56 | 130.81 | 131.06 | 131.32 | 131.57 | 131.83 |
| 5.20 | 132.08 | 132.33 | 132.59 | 132.84 | 133.10 | 133.35 | 133.60 | 133.86 | 134.11 | 134.37 |
| 5.30 | 134.62 | 134.87 | 135.13 | 135.38 | 135.64 | 135.89 | 136.14 | 136.40 | 136.65 | 136.91 |
| 5.40 | 137.16 | 137.41 | 137.67 | 137.92 | 138.18 | 138.43 | 138.68 | 138.94 | 139.19 | 139.45 |
| **5.50** | 139.70 | 139.95 | 140.21 | 140.46 | 140.72 | 140.97 | 141.22 | 141.48 | 141.73 | 141.99 |
| 5.60 | 142.24 | 142.49 | 142.75 | 143.00 | 143.26 | 143.51 | 143.76 | 144.02 | 144.27 | 144.53 |
| 5.70 | 144.78 | 145.03 | 145.29 | 145.54 | 145.80 | 146.05 | 146.30 | 146.56 | 146.81 | 147.07 |
| 5.80 | 147.32 | 147.57 | 147.83 | 148.08 | 148.34 | 148.59 | 148.84 | 149.10 | 149.35 | 149.61 |
| 5.90 | 149.86 | 150.11 | 150.37 | 150.62 | 150.88 | 151.13 | 151.38 | 151.64 | 151.89 | 152.15 |
| **6.00** | 152.40 | 152.66 | 152.91 | 153.16 | 153.42 | 153.67 | 153.92 | 154.18 | 154.43 | 154.69 |
| 6.10 | 154.94 | 155.19 | 155.45 | 155.70 | 155.96 | 156.21 | 156.46 | 156.72 | 156.97 | 157.23 |
| 6.20 | 157.48 | 157.73 | 157.99 | 158.24 | 158.50 | 158.75 | 159.00 | 159.26 | 159.51 | 159.77 |
| 6.30 | 160.02 | 160.27 | 160.53 | 160.78 | 161.04 | 161.29 | 161.54 | 161.80 | 162.05 | 162.31 |
| 6.40 | 162.56 | 162.81 | 163.07 | 163.32 | 163.58 | 163.83 | 164.08 | 164.34 | 164.59 | 164.85 |
| **6.50** | 165.10 | 165.35 | 165.61 | 165.86 | 166.12 | 166.37 | 166.62 | 166.88 | 167.13 | 167.39 |
| 6.60 | 167.64 | 167.89 | 168.15 | 168.40 | 168.66 | 168.91 | 169.16 | 169.42 | 169.67 | 169.93 |
| 6.70 | 170.18 | 170.43 | 170.69 | 170.94 | 171.20 | 171.45 | 171.70 | 171.96 | 172.21 | 172.47 |
| 6.80 | 172.72 | 172.97 | 173.23 | 173.48 | 173.74 | 173.99 | 174.24 | 174.50 | 174.75 | 175.01 |
| 6.90 | 175.26 | 175.51 | 175.77 | 176.02 | 176.28 | 176.53 | 176.78 | 177.04 | 177.29 | 177.55 |
| **7.00** | 177.80 | 178.05 | 178.31 | 178.56 | 178.82 | 179.07 | 179.32 | 179.58 | 179.83 | 180.09 |
| 7.10 | 180.34 | 180.59 | 180.85 | 181.10 | 181.36 | 181.61 | 181.86 | 182.12 | 182.37 | 182.63 |
| 7.20 | 182.88 | 183.13 | 183.39 | 183.64 | 183.90 | 184.15 | 184.40 | 184.66 | 184.91 | 185.17 |
| 7.30 | 185.42 | 185.67 | 185.93 | 186.18 | 186.44 | 186.69 | 186.94 | 187.20 | 187.45 | 187.71 |
| 7.40 | 187.96 | 188.21 | 188.47 | 188.72 | 188.98 | 189.23 | 189.48 | 189.74 | 189.99 | 190.25 |
| **7.50** | 190.50 | 190.75 | 191.01 | 191.26 | 191.52 | 191.77 | 192.02 | 192.28 | 192.53 | 192.79 |
| 7.60 | 193.04 | 193.29 | 193.55 | 193.80 | 194.06 | 194.31 | 194.56 | 194.82 | 195.07 | 195.33 |
| 7.70 | 195.58 | 195.83 | 196.09 | 196.34 | 196.60 | 196.85 | 197.10 | 197.36 | 197.61 | 197.87 |
| 7.80 | 198.12 | 198.37 | 198.63 | 198.88 | 199.14 | 199.39 | 199.64 | 199.90 | 200.15 | 200.41 |
| 7.90 | 200.66 | 200.91 | 201.17 | 201.42 | 201.68 | 201.93 | 202.18 | 202.44 | 202.69 | 202.95 |
| **8.00** | 203.20 | 203.45 | 203.71 | 203.96 | 204.22 | 204.47 | 204.72 | 204.98 | 205.23 | 205.49 |
| 8.10 | 205.74 | 205.99 | 206.25 | 206.50 | 206.76 | 207.01 | 207.26 | 207.52 | 207.77 | 208.03 |
| 8.20 | 208.28 | 208.53 | 208.79 | 209.04 | 209.30 | 209.55 | 209.80 | 210.06 | 210.31 | 210.57 |
| 8.30 | 210.82 | 211.07 | 211.33 | 211.58 | 211.84 | 212.09 | 212.34 | 212.60 | 212.85 | 213.11 |
| 8.40 | 213.36 | 213.61 | 213.87 | 214.12 | 214.38 | 214.63 | 214.88 | 215.14 | 215.39 | 215.65 |
| **8.50** | 215.90 | 216.15 | 216.41 | 216.66 | 216.92 | 217.17 | 217.42 | 217.68 | 217.93 | 218.19 |
| 8.60 | 218.44 | 218.69 | 218.95 | 219.20 | 219.46 | 219.71 | 219.96 | 220.22 | 220.47 | 220.73 |
| 8.70 | 220.98 | 221.23 | 221.49 | 221.74 | 222.00 | 222.25 | 222.50 | 222.76 | 223.01 | 223.27 |
| 8.80 | 223.52 | 223.77 | 224.03 | 224.28 | 224.54 | 224.79 | 225.04 | 225.30 | 225.55 | 225.81 |
| 8.90 | 226.06 | 226.31 | 226.57 | 226.82 | 227.08 | 227.33 | 227.58 | 227.84 | 228.09 | 228.35 |
| **9.00** | 228.60 | 228.85 | 229.11 | 229.36 | 229.62 | 229.87 | 230.12 | 230.38 | 230.63 | 230.89 |
| 9.10 | 231.14 | 231.39 | 231.65 | 231.90 | 232.16 | 232.41 | 232.66 | 232.92 | 233.17 | 233.43 |
| 9.20 | 233.68 | 233.93 | 234.19 | 234.44 | 234.70 | 234.95 | 235.20 | 235.46 | 235.71 | 235.97 |
| 9.30 | 236.22 | 236.47 | 236.73 | 236.98 | 237.24 | 237.49 | 237.74 | 238.00 | 238.25 | 238.51 |
| 9.40 | 238.76 | 239.01 | 239.27 | 239.52 | 239.78 | 240.03 | 240.28 | 240.54 | 240.79 | 241.05 |
| **9.50** | 241.30 | 241.55 | 241.81 | 242.06 | 242.32 | 242.57 | 242.82 | 243.08 | 243.33 | 243.59 |
| 9.60 | 243.84 | 244.09 | 244.35 | 244.60 | 244.86 | 245.11 | 245.36 | 245.62 | 245.87 | 246.13 |
| 9.70 | 246.38 | 246.63 | 246.89 | 247.14 | 247.40 | 247.65 | 247.90 | 248.16 | 248.41 | 248.67 |
| 9.80 | 248.92 | 249.17 | 249.43 | 249.68 | 249.94 | 250.19 | 250.44 | 250.70 | 250.95 | 251.21 |
| 9.90 | 251.46 | 251.71 | 251.97 | 252.22 | 252.48 | 252.73 | 252.98 | 253.24 | 253.49 | 253.75 |
| **10.00** | 254.00 | 254.25 | 254.51 | 254.76 | 255.02 | 255.27 | 255.52 | 255.78 | 256.03 | 256.29 |

| Proportional Parts. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 | |
| mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 | |

TABLE 9.

## INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **10.00** | 254.00 | 254.25 | 254.51 | 254.76 | 255.02 | 255.27 | 255.52 | 255.78 | 256.03 | 256.29 |
| 10.10 | 256.54 | 256.79 | 257.05 | 257.30 | 257.56 | 257.81 | 258.06 | 258.32 | 258.57 | 258.83 |
| 10.20 | 259.08 | 259.33 | 259.59 | 259.84 | 260.10 | 260.35 | 260.60 | 260.86 | 261.11 | 261.37 |
| 10.30 | 261.62 | 261.87 | 262.13 | 262.38 | 262.64 | 262.89 | 263.14 | 263.40 | 263.65 | 263.91 |
| 10.40 | 264.16 | 264.41 | 264.67 | 264.92 | 265.18 | 265.43 | 265.68 | 265.94 | 266.19 | 266.45 |
| **10.50** | 266.70 | 266.95 | 267.21 | 267.46 | 267.72 | 267.97 | 268.22 | 268.48 | 268.73 | 268.99 |
| 10.60 | 269.24 | 269.49 | 269.75 | 270.00 | 270.26 | 270.51 | 270.76 | 271.02 | 271.27 | 271.53 |
| 10.70 | 271.78 | 272.03 | 272.29 | 272.54 | 272.80 | 273.05 | 273.30 | 273.56 | 273.81 | 274.07 |
| 10.80 | 274.32 | 274.57 | 274.93 | 275.08 | 275.34 | 275.59 | 275.84 | 276.10 | 276.35 | 276.61 |
| 10.90 | 276.86 | 277.11 | 277.37 | 277.62 | 277.88 | 278.13 | 278.38 | 278.64 | 278.89 | 279.15 |
| **11.00** | 279.40 | 279.65 | 279.91 | 280.16 | 280.42 | 280.67 | 280.92 | 281.18 | 281.43 | 281.69 |
| 11.10 | 281.94 | 282.19 | 282.45 | 282.70 | 282.96 | 283.21 | 283.46 | 283.72 | 283.97 | 284.23 |
| 11.20 | 284.48 | 284.73 | 284.99 | 285.24 | 285.50 | 285.75 | 286.00 | 286.26 | 286.51 | 286.77 |
| 11.30 | 287.02 | 287.27 | 287.53 | 287.78 | 288.04 | 288.29 | 288.54 | 288.80 | 289.05 | 289.31 |
| 11.40 | 289.56 | 289.81 | 290.07 | 290.32 | 290.58 | 290.83 | 291.08 | 291.34 | 291.59 | 291.85 |
| **11.50** | 292.10 | 292.35 | 292.61 | 292.86 | 293.12 | 293.37 | 293.62 | 293.88 | 294.13 | 294.39 |
| 11.60 | 294.64 | 294.89 | 295.15 | 295.40 | 295.66 | 295.91 | 296.16 | 296.42 | 296.67 | 296.93 |
| 11.70 | 297.18 | 297.43 | 297.69 | 297.94 | 298.20 | 298.45 | 298.70 | 298.96 | 299.21 | 299.47 |
| 11.80 | 299.72 | 299.97 | 300.23 | 300.48 | 300.74 | 300.99 | 301.24 | 301.50 | 301.75 | 302.01 |
| 11.90 | 302.26 | 302.51 | 302.77 | 303.02 | 303.28 | 303.53 | 303.78 | 304.04 | 304.29 | 304.55 |
| **12.00** | 304.80 | 305.05 | 305.31 | 305.56 | 305.82 | 306.07 | 306.32 | 306.58 | 306.83 | 307.09 |
| 12.10 | 307.34 | 307.59 | 307.85 | 308.10 | 308.36 | 308.61 | 308.86 | 309.12 | 309.37 | 309.63 |
| 12.20 | 309.88 | 310.13 | 310.39 | 310.64 | 310.90 | 311.15 | 311.40 | 311.66 | 311.91 | 312.17 |
| 12.30 | 312.42 | 312.67 | 312.93 | 313.18 | 313.44 | 313.69 | 313.94 | 314.20 | 314.45 | 314.71 |
| 12.40 | 314.96 | 315.21 | 315.47 | 315.72 | 315.98 | 316.23 | 316.48 | 316.74 | 316.99 | 317.25 |
| **12.50** | 317.50 | 317.75 | 318.01 | 318.26 | 318.52 | 318.77 | 319.02 | 319.28 | 319.53 | 319.79 |
| 12.60 | 320.04 | 320.29 | 320.55 | 320.80 | 321.06 | 321.31 | 321.56 | 321.82 | 322.07 | 322.33 |
| 12.70 | 322.58 | 322.83 | 323.09 | 323.34 | 323.60 | 323.85 | 324.10 | 324.36 | 324.61 | 324.87 |
| 12.80 | 325.12 | 325.37 | 325.63 | 325.88 | 326.14 | 326.39 | 326.64 | 326.90 | 327.15 | 327.41 |
| 12.90 | 327.66 | 327.91 | 328.17 | 328.42 | 328.68 | 328.93 | 329.18 | 329.44 | 329.69 | 329.95 |
| **13.00** | 330.20 | 330.45 | 330.71 | 330.96 | 331.22 | 331.47 | 331.72 | 331.98 | 332.23 | 332.49 |
| 13.10 | 332.74 | 332.99 | 333.25 | 333.50 | 333.76 | 334.01 | 334.26 | 334.52 | 334.77 | 335.03 |
| 13.20 | 335.28 | 335.53 | 335.79 | 336.04 | 336.30 | 336.55 | 336.80 | 337.06 | 337.31 | 337.57 |
| 13.30 | 337.82 | 338.07 | 338.33 | 338.58 | 338.84 | 339.09 | 339.34 | 339.60 | 339.85 | 340.11 |
| 13.40 | 340.36 | 340.61 | 340.87 | 341.12 | 341.38 | 341.63 | 341.88 | 342.14 | 342.39 | 342.65 |
| **13.50** | 342.90 | 343.15 | 343.41 | 343.66 | 343.92 | 344.17 | 344.42 | 344.68 | 344.93 | 345.19 |
| 13.60 | 345.44 | 345.69 | 345.95 | 346.20 | 346.46 | 346.71 | 346.96 | 347.22 | 347.47 | 347.73 |
| 13.70 | 347.98 | 348.23 | 348.49 | 348.74 | 349.00 | 349.25 | 349.50 | 349.76 | 350.01 | 350.27 |
| 13.80 | 350.52 | 350.77 | 351.03 | 351.28 | 351.54 | 351.79 | 352.04 | 352.30 | 352.55 | 352.81 |
| 13.90 | 353.06 | 353.31 | 353.57 | 353.82 | 354.08 | 354.33 | 354.58 | 354.84 | 355.09 | 355.35 |
| **14.00** | 355.60 | 355.85 | 356.11 | 356.36 | 356.62 | 356.87 | 357.12 | 357.38 | 357.63 | 357.89 |
| 14.10 | 358.14 | 358.39 | 358.65 | 358.90 | 359.16 | 359.41 | 359.66 | 359.92 | 360.17 | 360.43 |
| 14.20 | 360.68 | 360.93 | 361.19 | 361.44 | 361.70 | 361.95 | 362.20 | 362.46 | 362.71 | 362.97 |
| 14.30 | 363.22 | 363.47 | 363.73 | 363.98 | 364.24 | 364.49 | 364.74 | 365.00 | 365.25 | 365.51 |
| 14.40 | 365.76 | 366.01 | 366.27 | 366.52 | 366.78 | 367.03 | 367.28 | 367.54 | 367.79 | 368.05 |
| **14.50** | 368.30 | 368.55 | 368.81 | 369.06 | 369.32 | 369.57 | 369.82 | 370.08 | 370.33 | 370.59 |
| 14.60 | 370.84 | 371.09 | 371.35 | 371.60 | 371.86 | 372.11 | 372.36 | 372.62 | 372.87 | 373.13 |
| 14.70 | 373.38 | 373.63 | 373.89 | 374.14 | 374.40 | 374.65 | 374.90 | 375.16 | 375.41 | 375.67 |
| 14.80 | 375.92 | 376.17 | 376.43 | 376.68 | 376.94 | 377.19 | 377.44 | 377.70 | 377.95 | 378.21 |
| 14.90 | 378.46 | 378.71 | 378.97 | 379.22 | 379.48 | 379.73 | 379.98 | 380.24 | 380.49 | 380.75 |
| **15.00** | 381.00 | 381.25 | 381.51 | 381.76 | 382.02 | 382.27 | 382.52 | 382.78 | 383.03 | 383.29 |

| Proportional Parts. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
| | mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 |

## INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **15.00** | 381.00 | 381.25 | 381.51 | 381.76 | 382.02 | 382.27 | 382.52 | 382.78 | 383.03 | 383.29 |
| 15.10 | 383.54 | 383.79 | 384.05 | 384.30 | 384.56 | 384.81 | 385.06 | 385.32 | 385.57 | 385.83 |
| 15.20 | 386.08 | 386.33 | 386.59 | 386.84 | 387.10 | 387.35 | 387.60 | 387.86 | 388.11 | 388.37 |
| 15.30 | 388.62 | 388.87 | 389.13 | 389.38 | 389.64 | 389.89 | 390.14 | 390.40 | 390.65 | 390.91 |
| 15.40 | 391.16 | 391.41 | 391.67 | 391.92 | 392.18 | 392.43 | 392.68 | 392.94 | 393.19 | 393.45 |
| **15.50** | 393.70 | 393.95 | 394.21 | 394.46 | 394.72 | 394.97 | 395.22 | 395.48 | 395.73 | 395.99 |
| 15.60 | 396.24 | 39.649 | 396.75 | 397.00 | 397.26 | 397.51 | 397.76 | 398.02 | 398.27 | 398.53 |
| 15.70 | 398.78 | 399.03 | 399.29 | 399.54 | 399.80 | 400.05 | 400.30 | 400.56 | 400.81 | 401.07 |
| 15.80 | 401.32 | 401.57 | 401.83 | 402.08 | 402.34 | 402.59 | 402.84 | 403.10 | 403.35 | 403.61 |
| 15.90 | 403.86 | 404.11 | 404.37 | 404.62 | 404.88 | 405.13 | 405.38 | 405.64 | 405.89 | 406.15 |
| **16.00** | 406.40 | 406.65 | 406.91 | 407.16 | 407.52 | 407.67 | 407.92 | 408.18 | 408.43 | 408.69 |
| 16.10 | 408.94 | 409.19 | 409.45 | 409.70 | 409.96 | 410.21 | 410.46 | 410.72 | 410.97 | 411.23 |
| 16.20 | 411.48 | 411.73 | 411.99 | 412.24 | 412.50 | 412.75 | 413.00 | 413.26 | 413.51 | 413.77 |
| 16.30 | 414.02 | 414.27 | 414.53 | 414.78 | 415.04 | 415.29 | 415.54 | 415.80 | 416.05 | 416.31 |
| 16.40 | 416.56 | 416.81 | 417.07 | 417.32 | 417.58 | 417.83 | 418.08 | 418.34 | 418.59 | 418.85 |
| **16.50** | 419.10 | 419.35 | 419.61 | 419.86 | 420.12 | 420.37 | 420.62 | 420.88 | 421.13 | 421.39 |
| 16.60 | 421.64 | 421.89 | 422.15 | 422.40 | 422.66 | 422.91 | 423.16 | 423.42 | 423.67 | 423.93 |
| 16.70 | 424.18 | 424.43 | 424.69 | 424.94 | 425.20 | 425.45 | 425.70 | 425.96 | 426.21 | 426.47 |
| 16.80 | 426.72 | 426.97 | 427.23 | 427.48 | 427.74 | 427.99 | 428.24 | 428.50 | 428.75 | 429.01 |
| 16.90 | 429.26 | 429.51 | 429.77 | 430.02 | 430.28 | 430.53 | 430.78 | 431.04 | 431.29 | 431.55 |
| **17.00** | 431.80 | 432.05 | 432.31 | 432.56 | 432.82 | 433.07 | 433.32 | 433.58 | 433.83 | 434.09 |
| 17.10 | 434.34 | 434.59 | 434.85 | 435.10 | 435.36 | 435.61 | 435.86 | 436.12 | 436.37 | 436.63 |
| 17.20 | 436.88 | 437.13 | 437.39 | 437.64 | 437.90 | 438.15 | 438.40 | 438.66 | 438.91 | 439.17 |
| 17.30 | 439.42 | 439.67 | 439.93 | 440.18 | 440.44 | 440.69 | 440.94 | 441.20 | 441.45 | 441.71 |
| 17.40 | 441.96 | 442.21 | 442.47 | 442.72 | 442.98 | 443.23 | 443.48 | 443.74 | 443.99 | 444.25 |
| **17.50** | 444.50 | 444.75 | 445.01 | 445.26 | 445.52 | 445.77 | 446.02 | 446.28 | 446.53 | 446.79 |
| 17.60 | 447.04 | 447.29 | 447.55 | 447.80 | 448.06 | 448.31 | 448.56 | 448.82 | 449.07 | 449.33 |
| 17.70 | 449.58 | 449.83 | 450.09 | 450.34 | 450.60 | 450.85 | 451.10 | 451.36 | 451.61 | 451.87 |
| 17.80 | 452.12 | 452.37 | 452.63 | 452.88 | 453.14 | 453.39 | 453.64 | 453.90 | 454.15 | 454.41 |
| 17.90 | 454.66 | 454.91 | 455.17 | 455.42 | 455.68 | 455.93 | 456.18 | 456.44 | 456.69 | 456.95 |
| **18.00** | 457.20 | 457.45 | 457.71 | 457.96 | 458.22 | 458.47 | 458.72 | 458.98 | 459.23 | 459.49 |
| 18.10 | 459.74 | 459.99 | 460.25 | 460.50 | 460.76 | 461.01 | 461.26 | 461.52 | 461.77 | 462.03 |
| 18.20 | 462.28 | 462.53 | 462.79 | 463.04 | 463.30 | 463.55 | 463.80 | 464.06 | 464.31 | 464.57 |
| 18.30 | 464.82 | 465.07 | 465.33 | 465.58 | 465.84 | 466.09 | 466.34 | 466.60 | 466.85 | 467.11 |
| 18.40 | 467.36 | 467.61 | 467.87 | 468.12 | 468.38 | 468.63 | 468.88 | 469.14 | 469.39 | 469.35 |
| **18.50** | 469.90 | 470.15 | 470.41 | 470.66 | 470.92 | 471.17 | 471.42 | 471.68 | 471.93 | 472.19 |
| 18.60 | 472.44 | 472.69 | 472.95 | 473.20 | 473.46 | 473.71 | 473.96 | 474.22 | 474.47 | 474.73 |
| 18.70 | 474.98 | 475.23 | 475.49 | 475.74 | 476.00 | 476.25 | 476.50 | 476.76 | 477.01 | 477.27 |
| 18.80 | 477.52 | 477.77 | 478.03 | 478.28 | 478.54 | 478.79 | 479.04 | 479.30 | 479.55 | 479.81 |
| 18.90 | 480.06 | 480.31 | 480.57 | 480.82 | 481.08 | 481.33 | 481.58 | 481.84 | 482.09 | 482.35 |
| **19.00** | 482.60 | 482.85 | 483.11 | 483.36 | 483.62 | 483.87 | 484.12 | 484.38 | 484.63 | 484.89 |
| 19.10 | 485.14 | 485.39 | 485.65 | 485.90 | 486.16 | 486.41 | 486.66 | 486.92 | 487.17 | 487.43 |
| 19.20 | 487.68 | 487.93 | 488.19 | 488.44 | 488.70 | 488.95 | 489.20 | 489.46 | 489.71 | 489.97 |
| 19.30 | 490.22 | 490.47 | 490.73 | 490.98 | 491.24 | 491.49 | 491.74 | 492.00 | 492.25 | 492.51 |
| 19.40 | 492.76 | 493.01 | 493.27 | 493.52 | 493.78 | 494.03 | 494.28 | 494.54 | 494.79 | 495.05 |
| **19.50** | 495.30 | 495.55 | 495.81 | 496.06 | 496.32 | 496.57 | 496.82 | 497.08 | 497.33 | 497.59 |
| 19.60 | 497.84 | 498.09 | 498.35 | 498.60 | 498.86 | 499.11 | 499.36 | 499.62 | 499.87 | 500.13 |
| 19.70 | 500.38 | 500.34 | 500.89 | 501.14 | 501.40 | 501.65 | 501.91 | 502.16 | 502.41 | 502.67 |
| 19.80 | 502.92 | 503.18 | 503.43 | 503.68 | 503.94 | 504.19 | 504.45 | 504.70 | 504.95 | 505.21 |
| 19.90 | 505.46 | 505.72 | 505.97 | 506.22 | 506.48 | 506.73 | 506.99 | 507.24 | 507.49 | 507.75 |
| **20.00** | 508.00 | 508.26 | 508.51 | 508.76 | 509.02 | 509.27 | 509.53 | 509.78 | 510.03 | 510.29 |

| Proportional Parts. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
| | mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 |

## INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **20.00** | 508.00 | 508.26 | 508.51 | 508.76 | 509.02 | 509.27 | 509.53 | 509.78 | 510.03 | 510.29 |
| 20.10 | 510.54 | 510.80 | 511.05 | 511.30 | 511.56 | 511.81 | 512.07 | 512.32 | 512.57 | 512.83 |
| 20.20 | 513.08 | 513.34 | 513.59 | 513.84 | 514.10 | 514.35 | 514.61 | 514.86 | 515.11 | 515.37 |
| 20.30 | 515.62 | 515.88 | 516.13 | 516.38 | 516.64 | 516.89 | 517.15 | 517.40 | 517.65 | 517.91 |
| 20.40 | 518.16 | 518.42 | 518.67 | 518.92 | 519.18 | 519.43 | 519.69 | 519.94 | 520.19 | 520.45 |
| **20.50** | 520.70 | 520.96 | 521.21 | 521.46 | 521.72 | 521.97 | 522.23 | 522.48 | 522.73 | 522.99 |
| 20.60 | 523.24 | 523.50 | 523.75 | 524.00 | 524.26 | 524.51 | 524.77 | 525.02 | 525.27 | 525.53 |
| 20.70 | 525.78 | 526.04 | 526.29 | 526.54 | 526.80 | 526.95 | 527.31 | 527.56 | 527.81 | 528.07 |
| 20.80 | 528.32 | 528.58 | 528.83 | 529.08 | 529.34 | 529.59 | 529.85 | 530.10 | 530.35 | 530.61 |
| 20.90 | 530.86 | 531.12 | 531.37 | 531.62 | 531.88 | 532.13 | 532.39 | 532.64 | 532.89 | 533.15 |
| **21.00** | 533.40 | 533.66 | 533.91 | 534.16 | 534.42 | 534.67 | 534.93 | 535.18 | 535.43 | 535.69 |
| 21.10 | 535.94 | 536.20 | 536.45 | 536.70 | 536.96 | 537.21 | 537.47 | 537.72 | 537.98 | 538.23 |
| 21.20 | 538.48 | 538.74 | 538.99 | 539.24 | 539.50 | 539.75 | 540.01 | 540.26 | 540.51 | 540.77 |
| 21.30 | 541.02 | 541.28 | 541.53 | 541.78 | 542.04 | 542.29 | 542.55 | 542.80 | 543.05 | 543.31 |
| 21.40 | 543.56 | 543.82 | 544.07 | 544.32 | 544.58 | 544.83 | 545.09 | 545.34 | 545.59 | 545.85 |
| **21.50** | 546.10 | 546.36 | 546.61 | 546.86 | 547.12 | 547.37 | 547.63 | 547.88 | 548.13 | 548.39 |
| 21.60 | 548.64 | 548.90 | 549.15 | 549.40 | 549.66 | 549.91 | 550.17 | 550.42 | 550.67 | 550.93 |
| 21.70 | 551.18 | 551.44 | 551.69 | 551.94 | 552.20 | 552.45 | 552.71 | 552.96 | 553.21 | 553.47 |
| 21.80 | 553.72 | 553.98 | 554.23 | 554.48 | 554.74 | 554.99 | 555.25 | 555.50 | 555.75 | 556.01 |
| 21.90 | 556.26 | 556.52 | 556.77 | 557.02 | 557.28 | 557.53 | 557.79 | 558.04 | 558.29 | 558.55 |
| **22.00** | 558.80 | 559.06 | 559.31 | 559.56 | 559.82 | 560.07 | 560.03 | 560.58 | 560.83 | 561.09 |
| 22.10 | 561.34 | 561.60 | 561.85 | 562.10 | 562.36 | 562.61 | 562.87 | 563.12 | 563.37 | 563.63 |
| 22.20 | 563.88 | 564.14 | 564.39 | 564.64 | 564.90 | 565.15 | 565.41 | 565.66 | 565.91 | 566.17 |
| 22.30 | 566.42 | 566.68 | 566.93 | 567.18 | 567.44 | 567.69 | 567.95 | 568.20 | 568.45 | 568.71 |
| 22.40 | 568.96 | 569.22 | 569.47 | 569.72 | 569.98 | 570.23 | 570.49 | 570.74 | 570.99 | 571.25 |
| **22.50** | 571.50 | 571.76 | 572.01 | 572.26 | 572.52 | 572.77 | 573.03 | 573.28 | 573.53 | 573.79 |
| 22.60 | 574.04 | 574.30 | 574.55 | 574.80 | 575.06 | 575.31 | 575.57 | 575.82 | 576.07 | 576.33 |
| 22.70 | 576.58 | 576.84 | 577.09 | 577.34 | 577.60 | 577.95 | 578.11 | 578.36 | 578.61 | 578.87 |
| 22.80 | 579.12 | 579.38 | 579.63 | 579.88 | 580.14 | 580.39 | 580.65 | 580.90 | 581.15 | 581.41 |
| 22.90 | 581.66 | 581.92 | 582.17 | 582.42 | 582.68 | 582.93 | 583.19 | 583.44 | 583.69 | 583.95 |
| **23.00** | 584.20 | 584.46 | 584.71 | 584.96 | 585.22 | 585.47 | 585.73 | 585.98 | 586.23 | 586.49 |
| 23.10 | 586.74 | 587.00 | 587.25 | 587.50 | 587.76 | 588.01 | 588.27 | 588.52 | 588.77 | 589.03 |
| 23.20 | 589.28 | 589.54 | 589.79 | 590.04 | 590.30 | 590.55 | 590.81 | 591.06 | 591.31 | 591.57 |
| 23.30 | 591.82 | 592.08 | 592.33 | 592.58 | 592.84 | 593.09 | 593.35 | 593.60 | 593.85 | 594.11 |
| 23.40 | 594.36 | 594.62 | 594.87 | 595.12 | 595.38 | 595.63 | 595.89 | 596.14 | 596.39 | 596.65 |
| **23.50** | 596.90 | 597.16 | 597.41 | 597.66 | 597.92 | 598.17 | 598.43 | 598.68 | 598.93 | 599.19 |
| 23.60 | 599.44 | 599.70 | 599.95 | 600.20 | 600.46 | 600.71 | 600.97 | 601.22 | 601.47 | 601.73 |
| 23.70 | 601.98 | 602.24 | 602.49 | 602.74 | 603.00 | 603.25 | 603.51 | 603.76 | 604.01 | 604.27 |
| 23.80 | 604.52 | 604.78 | 605.03 | 605.28 | 605.54 | 605.79 | 606.05 | 606.30 | 606.55 | 606.81 |
| 23.90 | 607.06 | 607.32 | 607.57 | 607.82 | 608.08 | 608.33 | 608.59 | 608.84 | 609.09 | 609.35 |
| **24.00** | 609.60 | 609.86 | 610.11 | 610.36 | 610.62 | 610.87 | 611.13 | 611.38 | 611.63 | 611.89 |
| 24.10 | 612.14 | 612.40 | 612.65 | 612.90 | 613.16 | 613.41 | 613.67 | 613.92 | 614.17 | 614.43 |
| 24.20 | 614.68 | 614.94 | 615.19 | 615.44 | 615.70 | 615.95 | 616.21 | 616.46 | 616.71 | 616.97 |
| 24.30 | 617.22 | 617.48 | 617.73 | 617.98 | 618.24 | 618.49 | 618.75 | 619.00 | 619.25 | 619.51 |
| 24.40 | 619.76 | 620.02 | 620.27 | 620.52 | 620.78 | 621.03 | 621.29 | 621.54 | 621.79 | 622.05 |
| **24.50** | 622.30 | 622.56 | 622.81 | 623.06 | 623.32 | 623.57 | 623.83 | 624.08 | 624.33 | 624.59 |
| 24.60 | 624.84 | 625 10 | 625.35 | 625.60 | 625.86 | 626.11 | 626.37 | 626.62 | 626.87 | 627.13 |
| 24.70 | 627.38 | 627.64 | 627.89 | 628.14 | 628.40 | 628.65 | 628.91 | 629.16 | 629.41 | 629.67 |
| 24.80 | 629.92 | 630.18 | 630.43 | 630.68 | 630.94 | 631.19 | 631.45 | 631.70 | 631.95 | 632.21 |
| 24.90 | 632.46 | 632.72 | 632.97 | 633.22 | 633.48 | 633.73 | 633.99 | 634.24 | 634.49 | 634.75 |
| **25.00** | 635.00 | 635.26 | 635.51 | 635.76 | 636.02 | 636.27 | 636.53 | 636.78 | 637.03 | 637.29 |

| Proportional Parts. | Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 |

# INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .03 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **25.00** | 635.00 | 635.26 | 635.51 | 635.76 | 636.02 | 636.27 | 636.53 | 636.78 | 637.03 | 637.29 |
| 25.10 | 637.54 | 637.80 | 638.05 | 638.30 | 638.56 | 638.81 | 639.07 | 639.32 | 639.57 | 639.83 |
| 25.20 | 640.08 | 640.34 | 640.59 | 640.84 | 641.10 | 641.35 | 641.61 | 641.86 | 642.11 | 642.37 |
| 25.30 | 642.62 | 642.88 | 643.13 | 643.38 | 643.64 | 643.89 | 644.15 | 644.40 | 644.65 | 644.91 |
| 25.40 | 645.16 | 645.42 | 645.67 | 645.92 | 646.18 | 646.43 | 646.69 | 646.94 | 647.19 | 647.45 |
| **25.50** | 647.70 | 647.96 | 648.21 | 648.46 | 648.72 | 648.97 | 649.23 | 649.48 | 649.73 | 649.99 |
| 25.60 | 650.24 | 650.50 | 650.75 | 651.00 | 651.26 | 651.51 | 651.77 | 652.02 | 654.27 | 652.53 |
| 25.70 | 652.78 | 653.04 | 653.29 | 653.54 | 653.80 | 654.05 | 654.31 | 654.56 | 654.81 | 655.07 |
| 25.80 | 655.32 | 655.58 | 655.83 | 656.08 | 656.34 | 656.59 | 656.85 | 657.10 | 657.35 | 657.61 |
| 25.90 | 657.86 | 658.12 | 658.37 | 658.62 | 658.88 | 659.13 | 659.39 | 659.64 | 659.89 | 660.15 |
| **26.00** | 660.40 | 660.66 | 660.91 | 661.16 | 661.42 | 661.67 | 661.93 | 662.18 | 662.43 | 662.69 |
| 26.10 | 662.94 | 663.20 | 663.45 | 663.70 | 663.96 | 664.21 | 664.47 | 664.72 | 664.97 | 665.23 |
| 26.20 | 665.48 | 665.74 | 665.99 | 666.24 | 666.50 | 666.75 | 667.01 | 667.26 | 667.51 | 667.77 |
| 26.30 | 668.02 | 668.28 | 668.53 | 668.78 | 669.04 | 669.29 | 669.55 | 669.80 | 670.05 | 670.31 |
| 26.40 | 670.56 | 670.82 | 671.07 | 671.32 | 671.58 | 671.83 | 672.09 | 672.34 | 672.59 | 672.85 |
| **26.50** | 673.10 | 673.36 | 673.61 | 673.86 | 674.12 | 674.37 | 674.63 | 674.88 | 675.13 | 675.39 |
| 26.60 | 675.64 | 675.90 | 676.15 | 676.40 | 676.66 | 676.91 | 677.17 | 677.42 | 677.67 | 677.93 |
| 26.70 | 678.18 | 678.44 | 678.69 | 678.94 | 679.20 | 679.45 | 679.71 | 679.96 | 680.21 | 680.47 |
| 26.80 | 680.72 | 680.98 | 681.23 | 681.48 | 681.74 | 681.99 | 682.25 | 682.50 | 682.75 | 683.01 |
| 26.90 | 683.26 | 683.52 | 683.77 | 684.02 | 684.28 | 684.53 | 684.79 | 685.04 | 685.29 | 685.55 |
| **27.00** | 685.80 | 686.06 | 686.31 | 686.56 | 686.82 | 687.07 | 687.33 | 687.58 | 687.83 | 688.09 |
| 27.10 | 688.34 | 688.60 | 688.85 | 689.10 | 689.36 | 689.61 | 689.87 | 690.12 | 690.37 | 690.63 |
| 27.20 | 690.88 | 691.14 | 691.39 | 691.64 | 691.90 | 692.15 | 692.41 | 692.66 | 692.91 | 693.17 |
| 27.30 | 693.42 | 693.68 | 693.93 | 694.18 | 694.44 | 694.69 | 694.95 | 695.20 | 695.45 | 695.71 |
| 27.40 | 695.96 | 696.22 | 696.47 | 696.72 | 696.98 | 697.23 | 697.49 | 697.74 | 697.99 | 698.25 |
| **27.50** | 698.50 | 698.76 | 699.01 | 699.26 | 699.52 | 699.77 | 700.03 | 700.28 | 700.53 | 700.79 |
| 27.60 | 701.04 | 701.30 | 701.55 | 701.80 | 702.06 | 702.31 | 702.57 | 702.82 | 703.07 | 703.33 |
| 27.70 | 703.58 | 703.84 | 704.09 | 704.34 | 704.60 | 704.85 | 705.11 | 705.36 | 705.61 | 705.87 |
| 27.80 | 706.12 | 706.38 | 706.63 | 706.88 | 707.14 | 707.39 | 707.65 | 707.90 | 708.15 | 708.41 |
| 27.90 | 708.66 | 708.92 | 709.17 | 709.42 | 709.68 | 709.93 | 710.19 | 710.44 | 710.69 | 710.95 |
| **28.00** | 711.20 | 711.46 | 711.71 | 711.96 | 712.22 | 712.47 | 712.73 | 712.98 | 713.23 | 713.49 |
| 28.10 | 713.74 | 714.00 | 714.25 | 714.50 | 714.76 | 715.01 | 715.27 | 715.52 | 715.77 | 716.03 |
| 28.20 | 716.28 | 716.54 | 716.79 | 717.04 | 717.30 | 717.55 | 717.81 | 718.06 | 718.31 | 718.57 |
| 28.30 | 718.82 | 719.08 | 719.33 | 719.58 | 719.84 | 720.09 | 720.35 | 720.60 | 720.85 | 721.11 |
| 28.40 | 721.36 | 721.62 | 721.87 | 722.12 | 722.39 | 722.63 | 722.89 | 723.14 | 723.39 | 723.65 |
| **28.50** | 723.90 | 724.16 | 724.41 | 724.66 | 724.92 | 725.17 | 725.43 | 725.68 | 725.93 | 726.19 |
| 28.60 | 726.44 | 726.70 | 726.95 | 727.20 | 727.46 | 727.71 | 727.97 | 728.22 | 728.47 | 728.73 |
| 28.70 | 728.98 | 729.24 | 729.49 | 729.74 | 730.00 | 730.25 | 730.51 | 730.76 | 731.01 | 731.27 |
| 28.80 | 731.52 | 731.78 | 732.03 | 732.28 | 732.54 | 732.79 | 733.05 | 733.30 | 733.55 | 733.81 |
| 28.90 | 734.06 | 734.32 | 734.57 | 734.82 | 735.08 | 735.33 | 735.59 | 735.84 | 736.09 | 736.35 |
| **29.00** | 736.60 | 736.86 | 737.11 | 737.36 | 737.62 | 737.87 | 738.13 | 738.38 | 738.63 | 738.89 |
| 29.10 | 739.14 | 739.40 | 739.65 | 739.90 | 740.16 | 740.41 | 740.67 | 740.92 | 741.17 | 741.43 |
| 29.20 | 741.68 | 741.94 | 742.19 | 742.44 | 742.70 | 742.95 | 743.21 | 743.46 | 743.71 | 743.97 |
| 29.30 | 744.22 | 744.48 | 744.73 | 744.98 | 745.24 | 745.49 | 745.75 | 746.00 | 746.25 | 746.51 |
| 29.40 | 746.76 | 747.02 | 747.27 | 747.52 | 747.78 | 748.03 | 748.29 | 748.54 | 748.79 | 749.05 |
| **29.50** | 749.30 | 749.56 | 749.81 | 750.06 | 750.32 | 750.57 | 750.83 | 751.08 | 751.33 | 751.59 |
| 29.60 | 751.84 | 752.10 | 752.35 | 752.60 | 752.86 | 753.11 | 753.37 | 753.62 | 753.87 | 754.13 |
| 29.70 | 754.38 | 754.64 | 754.89 | 755.14 | 755.40 | 755.65 | 755.91 | 756.16 | 756.41 | 756.67 |
| 29.80 | 756.92 | 757.18 | 757.43 | 757.68 | 757.94 | 758.19 | 758.45 | 758.70 | 758.95 | 759.21 |
| 29.90 | 759.46 | 759.72 | 759.97 | 760.22 | 760.48 | 760.73 | 760.99 | 761.24 | 761.49 | 761.75 |
| **30.00** | 762.00 | 762.26 | 762.51 | 762.76 | 763.02 | 763.27 | 763.53 | 763.78 | 764.03 | 764.29 |

| Proportional Parts. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
| | mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 |

Table 9.

## INCHES INTO MILLIMETERS.

1 inch = 25.40005 mm.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| **30.00** | 762.00 | 762.26 | 762.51 | 762.76 | 763.02 | 763.27 | 763.53 | 763.78 | 764.03 | 764.29 |
| 30.10 | 764.54 | 764.80 | 765.05 | 765.30 | 765.56 | 765.81 | 766.07 | 766.32 | 766.57 | 766.83 |
| 30.20 | 767.08 | 767.34 | 767.59 | 767.84 | 768.10 | 768.35 | 768.61 | 768.86 | 769.11 | 769.37 |
| 30.30 | 769.62 | 769.88 | 770.13 | 770.38 | 770.64 | 770.89 | 771.15 | 771.40 | 771.65 | 771.91 |
| 30.40 | 772.16 | 772.42 | 772.67 | 772.92 | 773.18 | 773.43 | 773.69 | 773.94 | 774.19 | 774.45 |
| **30.50** | 774.70 | 774.96 | 775.21 | 775.46 | 775.72 | 775.97 | 776.23 | 776.48 | 776.73 | 776.99 |
| 30.60 | 777.24 | 777.50 | 777.75 | 778.00 | 778.26 | 778.51 | 778.77 | 779.02 | 779.27 | 779.53 |
| 30.70 | 779.78 | 780.04 | 780.29 | 780.54 | 780.80 | 781.05 | 781.31 | 781.56 | 781.81 | 782.07 |
| 30.80 | 782.32 | 782.58 | 782.83 | 783.08 | 783.34 | 783.59 | 783.85 | 784.10 | 784.35 | 784.61 |
| 30.90 | 784.86 | 785.12 | 785.37 | 785.62 | 785.88 | 786.13 | 786.39 | 786.64 | 786.89 | 787.15 |
| **31.00** | 787.40 | 787.66 | 787.91 | 788.16 | 788.42 | 788.67 | 788.93 | 789.18 | 789.43 | 789.69 |
| 31.10 | 789.94 | 790.20 | 790.45 | 790.70 | 790.96 | 791.21 | 791.47 | 791.72 | 791.97 | 792.23 |
| 31.20 | 792.48 | 792.74 | 792.99 | 793.24 | 793.50 | 793.75 | 794.01 | 794.26 | 794.51 | 794.77 |
| 31.30 | 795.02 | 795.28 | 795.53 | 795.78 | 796.04 | 796.29 | 796.55 | 796.80 | 797.05 | 797.31 |
| 31.40 | 797.56 | 797.82 | 798.07 | 798.32 | 798.58 | 798.83 | 799.09 | 799.34 | 799.59 | 799.85 |
| **31.50** | 800.10 | 800.36 | 800.61 | 800.86 | 801.12 | 801.37 | 801.63 | 801.88 | 802.13 | 802.39 |
| 31.60 | 802.64 | 802.90 | 803.15 | 803.40 | 803.66 | 803.91 | 804.17 | 804.42 | 804.67 | 804.93 |
| 31.70 | 805.18 | 805.44 | 805.69 | 805.94 | 806.20 | 806.45 | 806.71 | 806.96 | 807.21 | 807.47 |
| 31.80 | 807.72 | 807.98 | 808.23 | 808.48 | 808.74 | 808.99 | 809.25 | 809.50 | 809.75 | 810.01 |
| 31.90 | 810.26 | 810.52 | 810.77 | 811.02 | 811.28 | 811.53 | 811.79 | 812.04 | 812.29 | 812.55 |
| **32.00** | 812.80 | | | | | | | | | |

| Proportional Parts. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | 0.001 | 0.002 | 0.003 | 0.004 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 |
| | mm. | 0.025 | 0.051 | 0.076 | 0.102 | 0.127 | 0.152 | 0.178 | 0.203 | 0.229 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 0 | 0.0000 | 0.0394 | 0.0787 | 0.1181 | 0.1575 | 0.1968 | 0.2362 | 0.2756 | 0.3150 | 0.3543 |
| 10 | 0.3937 | 0.4331 | 0.4724 | 0.5118 | 0.5512 | 0.5906 | 0.6299 | 0.6693 | 0.7087 | 0.7480 |
| 20 | 0.7874 | 0.8268 | 0.8661 | 0.9055 | 0.9449 | 0.9842 | 1.0236 | 1.0630 | 1.1024 | 1.1417 |
| 30 | 1.1811 | 1.2205 | 1.2598 | 1.2992 | 1.3386 | 1.3780 | 1.4173 | 1.4567 | 1.4961 | 1.5354 |
| 40 | 1.5748 | 1.6142 | 1.6535 | 1.6929 | 1.7323 | 1.7716 | 1.8110 | 1.8504 | 1.8898 | 1.9291 |
| 50 | 1.9685 | 2.0079 | 2.0472 | 2.0866 | 2.1260 | 2.1654 | 2.2047 | 2.2441 | 2.2835 | 2.3228 |
| 60 | 2.3622 | 2.4016 | 2.4409 | 2.4803 | 2.5197 | 2.5590 | 2.5984 | 2.6378 | 2.6772 | 2.7165 |
| 70 | 2.7559 | 2.7953 | 2.8346 | 2.8740 | 2.9134 | 2.9528 | 2.9921 | 3.0315 | 3.0709 | 3.1102 |
| 80 | 3.1496 | 3.1890 | 3.2283 | 3.2677 | 3.3071 | 3.3464 | 3.3858 | 3.4252 | 3.4646 | 3.5039 |
| 90 | 3.5433 | 3.5828 | 3.6220 | 3.6614 | 3.7008 | 3.7402 | 3.7795 | 3.8189 | 3.8583 | 3.8976 |
| 100 | 3.9370 | 3.9764 | 4.0157 | 4.0551 | 4.0945 | 4.1338 | 4.1732 | 4.2126 | 4.2520 | 4.2913 |
| 110 | 4.3307 | 4.3701 | 4.4094 | 4.4488 | 4.4882 | 4.5276 | 4.5669 | 4.6063 | 4.6457 | 4.6850 |
| 120 | 4.7244 | 4.7638 | 4.8031 | 4.8425 | 4.8819 | 4.9212 | 4.9606 | 5.0000 | 5.0394 | 5.0787 |
| 130 | 5.1181 | 5.1575 | 5.1968 | 5.2362 | 5.2756 | 5.3150 | 5.3543 | 5.3937 | 5.4331 | 5.4724 |
| 140 | 5.5118 | 5.5512 | 5.5905 | 5.6299 | 5.6693 | 5.7086 | 5.7480 | 5.7874 | 5.8268 | 5.8661 |
| 150 | 5.9055 | 5.9449 | 5.9842 | 6.0236 | 6.0630 | 6.1024 | 6.1417 | 6.1811 | 6.2205 | 6.2598 |
| 160 | 6.2992 | 6.3386 | 6.3779 | 6.4173 | 6.4567 | 6.4960 | 6.5354 | 6.5748 | 6.6142 | 6.6535 |
| 170 | 6.6929 | 6.7323 | 6.7716 | 6.8110 | 6.8504 | 6.8898 | 6.9291 | 6.9685 | 7.0079 | 7.0472 |
| 180 | 7.0866 | 7.1260 | 7.1653 | 7.2047 | 7.2441 | 7.2834 | 7.3228 | 7.3622 | 7.4016 | 7.4409 |
| 190 | 7.4803 | 7.5197 | 7.5590 | 7.5984 | 7.6378 | 7.6772 | 7.7165 | 7.7559 | 7.7953 | 7.8346 |
| 200 | 7.8740 | 7.9134 | 7.9527 | 7.9921 | 8.0315 | 8.0708 | 8.1102 | 8.1496 | 8.1890 | 8.2283 |
| 210 | 8.2677 | 8.3071 | 8.3464 | 8.3858 | 8.4252 | 8.4646 | 8.5039 | 8.5433 | 8.5827 | 8.6220 |
| 220 | 8.6614 | 8.7008 | 8.7401 | 8.7795 | 8.8189 | 8.8582 | 8.8976 | 8.9370 | 8.9764 | 9.0157 |
| 230 | 9.0551 | 9.0945 | 9.1338 | 9.1732 | 9.2126 | 9.2520 | 9.2913 | 9.3307 | 9.3701 | 9.4094 |
| 240 | 9.4488 | 9.4882 | 9.5275 | 9.5669 | 9.6063 | 9.6456 | 9.6850 | 9.7244 | 9.7638 | 9.8031 |
| 250 | 9.8425 | 9.8819 | 9.9212 | 9.9606 | 10.0000 | 10.0394 | 10.0787 | 10.1181 | 10.1575 | 10.1968 |
| 260 | 10.2362 | 10.2756 | 10.3149 | 10.3543 | 10.3937 | 10.4330 | 10.4724 | 10.5118 | 10.5512 | 10.5905 |
| 270 | 10.6299 | 10.6693 | 10.7086 | 10.7480 | 10.7874 | 10.8268 | 10.8661 | 10.9055 | 10.9449 | 10.9842 |
| 280 | 11.0236 | 11.0630 | 11.1023 | 11.1417 | 11.1811 | 11.2204 | 11.2598 | 11.2992 | 11.3338 | 11.3779 |
| 290 | 11.4173 | 11.4568 | 11.4960 | 11.5354 | 11.5748 | 11.6142 | 11.6535 | 11.6929 | 11.7323 | 11.7716 |
| 300 | 11.8110 | 11.8504 | 11.8897 | 11.9291 | 11.9685 | 12.0078 | 12.0472 | 12.0866 | 12.1260 | 12.1653 |
| 310 | 12.2047 | 12.2441 | 12.2834 | 12.3228 | 12.3622 | 12.4016 | 12.4409 | 12.4803 | 12.5197 | 12.5590 |
| 320 | 12.5984 | 12.6378 | 12.6771 | 12.7165 | 12.7559 | 12.7952 | 12.8346 | 12.8740 | 12.9134 | 12.9527 |
| 330 | 12.9921 | 13.0315 | 13.0708 | 13.1102 | 13.1496 | 13.1890 | 13.2283 | 13.2677 | 13.3071 | 13.3464 |
| 340 | 13.3858 | 13.4252 | 13.4645 | 13.5039 | 13.5433 | 13.5826 | 13.6220 | 13.6614 | 13.7008 | 13.7401 |
| 350 | 13.7795 | 13.8189 | 13.8582 | 13.8976 | 13.9370 | 13.9764 | 14.0157 | 14.0551 | 14.0945 | 14.1338 |
| 360 | 14.1732 | 14.2126 | 14.2519 | 14.2913 | 14.3307 | 14.3700 | 14.4094 | 14.4488 | 14.4882 | 14.5275 |
| 370 | 14.5669 | 14.6063 | 14.6456 | 14 6850 | 14.7244 | 14.7638 | 14.8031 | 14.8425 | 14.8819 | 14.9212 |
| 380 | 14.9606 | 15.0000 | 15.0393 | 15.0787 | 15.1181 | 15.1574 | 15.1968 | 15.2362 | 15.2756 | 15.3149 |
| 390 | 15.3543 | 15.3937 | 15.4330 | 15.4724 | 15.5118 | 15.5512 | 15.5905 | 15.6299 | 15.6693 | 15.7086 |
| 400 | 15.7480 | 15.7874 | 15.8267 | 15.8661 | 15.9055 | 15.9448 | 15.9842 | 16.0236 | 16.0630 | 16.1023 |

| Tenths of a millimeter. | | | | Hundredths of a millimeter. | | | |
|---|---|---|---|---|---|---|---|
| mm. | Inch. | mm. | Inch. | mm. | Inch. | mm. | Inch. |
| 0.1 | 0.0039 | 0.6 | 0.0236 | 0.01 | 0.0004 | 0.06 | 0.0024 |
| .2 | .0079 | .7 | .0276 | .02 | .0008 | .07 | .0028 |
| .3 | .0118 | .8 | .0315 | .03 | .0012 | .08 | .0031 |
| .4 | .0157 | .9 | .0354 | .04 | .0016 | .09 | .0035 |
| .5 | .0197 | 1.0 | .0394 | .05 | .0020 | .10 | .0039 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 400 | 15.748 | 15.752 | 15.756 | 15.760 | 15.764 | 15.768 | 15.772 | 15.776 | 15.779 | 15.783 |
| 401 | 15.787 | 15.791 | 15.795 | 15.799 | 15.803 | 15.807 | 15.811 | 15.815 | 15.819 | 15.823 |
| 402 | 15.827 | 15.831 | 15.835 | 15.839 | 15.842 | 15.846 | 15.850 | 15.854 | 15.858 | 15.862 |
| 403 | 15.866 | 15.870 | 15.874 | 15.878 | 15.882 | 15.886 | 15.890 | 15.894 | 15.898 | 15.902 |
| 404 | 15.905 | 15.909 | 15.913 | 15.917 | 15.921 | 15.925 | 15.929 | 15.933 | 15.937 | 15.941 |
| 405 | 15.945 | 15.949 | 15.953 | 15.957 | 15.961 | 15.965 | 15.968 | 15.972 | 15.976 | 15.980 |
| 406 | 15.984 | 15.988 | 15.992 | 15.996 | 16.000 | 16.004 | 16.008 | 16.012 | 16.016 | 16.020 |
| 407 | 16.024 | 16.028 | 16.031 | 16.035 | 16.039 | 16.043 | 16.047 | 16.051 | 16.055 | 16.059 |
| 408 | 16.063 | 16.067 | 16.071 | 16.075 | 16.079 | 16.083 | 16.087 | 16.091 | 16.094 | 16.098 |
| 409 | 16.102 | 16.106 | 16.110 | 16.114 | 16.118 | 16.122 | 16.126 | 16.130 | 16.134 | 16.138 |
| 410 | 16.142 | 16.146 | 16.150 | 16.154 | 16.157 | 16.161 | 16.165 | 16.169 | 16.173 | 16.177 |
| 411 | 16.181 | 16.185 | 16.189 | 16.193 | 16.197 | 16.201 | 16.205 | 16.209 | 16.213 | 16.217 |
| 412 | 16.220 | 16.224 | 16.228 | 16.232 | 16.236 | 16.240 | 16.244 | 16.248 | 16.252 | 16.256 |
| 413 | 16.260 | 16.264 | 16.268 | 16.272 | 16.276 | 16.279 | 16.283 | 16.287 | 16.291 | 16.295 |
| 414 | 16.299 | 16.303 | 16.307 | 16.311 | 16.315 | 16.319 | 16.323 | 16.327 | 16.331 | 16.335 |
| 415 | 16.339 | 16.342 | 16.346 | 16.350 | 16.354 | 16.358 | 16.362 | 16.366 | 16.370 | 16.374 |
| 416 | 16.378 | 16.382 | 16.386 | 16.390 | 16.394 | 16.398 | 16.402 | 16.405 | 16.409 | 16.413 |
| 417 | 16.417 | 16.421 | 16.425 | 16.429 | 16.433 | 16.437 | 16.441 | 16.445 | 16.449 | 16.453 |
| 418 | 16.457 | 16.461 | 16.465 | 16.468 | 16.472 | 16.476 | 16.480 | 16.484 | 16.488 | 16.492 |
| 419 | 16.496 | 16.500 | 16.504 | 16.508 | 16.512 | 16.516 | 16.520 | 16.524 | 16.528 | 16.531 |
| 420 | 16.535 | 16.539 | 16.543 | 16.547 | 16.551 | 16.555 | 16.559 | 16.563 | 16.567 | 16.571 |
| 421 | 16.575 | 16.579 | 16.583 | 16.587 | 16.591 | 16.594 | 16.598 | 16.602 | 16.606 | 16.610 |
| 422 | 16.614 | 16.618 | 16.622 | 16.626 | 16.630 | 16.634 | 16.638 | 16.642 | 16.646 | 16.650 |
| 423 | 16.654 | 16.657 | 16.661 | 16.665 | 16.669 | 16.673 | 16.677 | 16.681 | 16.685 | 16.689 |
| 424 | 16.693 | 16.697 | 16.701 | 16.705 | 16.709 | 16.713 | 16.717 | 16.720 | 16.724 | 16.728 |
| 425 | 16.732 | 16.736 | 16.740 | 16.744 | 16.748 | 16.752 | 16.756 | 16.760 | 16.764 | 16.768 |
| 426 | 16.772 | 16.776 | 16.779 | 16.783 | 16.787 | 16.791 | 16.795 | 16.799 | 16.803 | 16.807 |
| 427 | 16.811 | 16.815 | 16.819 | 16.823 | 16.827 | 16.831 | 16.835 | 16.839 | 16.842 | 16.846 |
| 428 | 16.850 | 16.854 | 16.858 | 16.862 | 16.866 | 16.870 | 16.874 | 16.878 | 16.882 | 16.886 |
| 429 | 16.890 | 16.894 | 16.898 | 16.902 | 16.905 | 16.909 | 16.913 | 16.917 | 16.921 | 16.925 |
| 430 | 16.929 | 16.933 | 16.937 | 16.941 | 16.945 | 16.949 | 16.953 | 16.957 | 16.961 | 16.965 |
| 431 | 16.968 | 16.972 | 16.976 | 16.980 | 16.984 | 16.988 | 16.992 | 16.996 | 17.000 | 17.004 |
| 432 | 17.008 | 17.012 | 17.016 | 17.020 | 17.024 | 17.028 | 17.031 | 17.035 | 17.039 | 17.043 |
| 433 | 17.047 | 17.051 | 17.055 | 17.059 | 17.063 | 17.067 | 17.071 | 17.075 | 17.079 | 17.083 |
| 434 | 17.087 | 17.091 | 17.094 | 17.098 | 17.102 | 17.106 | 17.110 | 17.114 | 17.118 | 17.122 |
| 435 | 17.126 | 17.130 | 17.134 | 17.138 | 17.142 | 17.146 | 17.150 | 17.154 | 17.157 | 17.161 |
| 436 | 17.165 | 17.169 | 17.173 | 17.177 | 17.181 | 17.185 | 17.189 | 17.193 | 17.197 | 17.201 |
| 437 | 17.205 | 17.209 | 17.213 | 17.217 | 17.220 | 17.224 | 17.228 | 17.232 | 17.236 | 17.240 |
| 438 | 17.244 | 17.248 | 17.252 | 17.256 | 17.260 | 17.264 | 17.268 | 17.272 | 17.276 | 17.279 |
| 439 | 17.283 | 17.287 | 17.291 | 17.295 | 17.299 | 17.303 | 17.307 | 17.311 | 17.315 | 17.319 |
| 440 | 17.323 | 17.327 | 17.331 | 17.335 | 17.339 | 17.342 | 17.346 | 17.350 | 17.354 | 17.358 |
| 441 | 17.362 | 17.366 | 17.370 | 17.374 | 17.378 | 17.382 | 17.386 | 17.390 | 17.394 | 17.398 |
| 442 | 17.402 | 17.405 | 17.409 | 17.413 | 17.417 | 17.421 | 17.425 | 17.429 | 17.433 | 17.437 |
| 443 | 17.441 | 17.445 | 17.449 | 17.453 | 17.457 | 17.461 | 17.465 | 17.468 | 17.472 | 17.476 |
| 444 | 17.480 | 17.484 | 17.488 | 17.492 | 17.496 | 17.500 | 17.504 | 17.508 | 17.512 | 17.516 |
| 445 | 17.520 | 17.524 | 17.528 | 17.531 | 17.535 | 17.539 | 17.543 | 17.547 | 17.551 | 17.555 |
| 446 | 17.559 | 17.563 | 17.567 | 17.571 | 17.575 | 17.579 | 17.583 | 17.587 | 17.591 | 17.594 |
| 447 | 17.598 | 17.602 | 17.606 | 17.610 | 17.614 | 17.618 | 17.622 | 17.626 | 17.630 | 17.634 |
| 448 | 17.638 | 17.642 | 17.646 | 17.650 | 17.654 | 17.657 | 17.661 | 17.665 | 17.669 | 17.673 |
| 449 | 17.677 | 17.681 | 17.685 | 17.689 | 17.693 | 17.697 | 17.701 | 17.705 | 17.709 | 17.713 |
| 450 | 17.717 | 17.720 | 17.724 | 17.728 | 17.732 | 17.736 | 17.740 | 17.744 | 17.748 | 17.752 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| **450** | 17.717 | 17.720 | 17.724 | 17.728 | 17.732 | 17.736 | 17.740 | 17.744 | 17.748 | 17.752 |
| 451 | 17.756 | 17.760 | 17.764 | 17.768 | 17.772 | 17.776 | 17.779 | 17.783 | 17.787 | 17.791 |
| 452 | 17.795 | 17.799 | 17.803 | 17.807 | 17.811 | 17.815 | 17.819 | 17.823 | 17.827 | 17.831 |
| 453 | 17.835 | 17.839 | 17.842 | 17.846 | 17.850 | 17.854 | 17.858 | 17.862 | 17.866 | 17.870 |
| 454 | 17.874 | 17.878 | 17.882 | 17.886 | 17.890 | 17.894 | 17.898 | 17.902 | 17.905 | 17.909 |
| **455** | 17.913 | 17.917 | 17.921 | 17.925 | 17.929 | 17.933 | 17.937 | 17.941 | 17.945 | 17.949 |
| 456 | 17.953 | 17.957 | 17.961 | 17.965 | 17.968 | 17.972 | 17.976 | 17.980 | 17.984 | 17.988 |
| 457 | 17.992 | 17.996 | 18.000 | 18.004 | 18.008 | 18.012 | 18.016 | 18.020 | 18.024 | 18.028 |
| 458 | 18.031 | 18.035 | 18.039 | 18.043 | 18.047 | 18.051 | 18.055 | 18.059 | 18.063 | 18.067 |
| 459 | 18.071 | 18.075 | 18.079 | 18.083 | 18.087 | 18.091 | 18.094 | 18.098 | 18.102 | 18.106 |
| **460** | 18.110 | 18.114 | 18.118 | 18.122 | 18.126 | 18.130 | 18.134 | 18.138 | 18.142 | 18.146 |
| 461 | 18.150 | 18.154 | 18.157 | 18.161 | 18.165 | 18.169 | 18.173 | 18.177 | 18.181 | 18.185 |
| 462 | 18.189 | 18.193 | 18.197 | 18.201 | 18.205 | 18.209 | 18.213 | 18.216 | 18.220 | 18.224 |
| 463 | 18.228 | 18.232 | 18.236 | 18.240 | 18.244 | 18.248 | 18.252 | 18.256 | 18.260 | 18.264 |
| 464 | 18.268 | 18.272 | 18.276 | 18.279 | 18.283 | 18.287 | 18.291 | 18.295 | 18.299 | 18.303 |
| **465** | 18.307 | 18.311 | 18.315 | 18.319 | 18.323 | 18.327 | 18.331 | 18.335 | 18.339 | 18.342 |
| 466 | 18.346 | 18.350 | 18.354 | 18.358 | 18.362 | 18.366 | 18.370 | 18.374 | 18.378 | 18.382 |
| 467 | 18.386 | 18.390 | 18.394 | 18.398 | 18.402 | 18.405 | 18.409 | 18.413 | 18.417 | 18.421 |
| 468 | 18.425 | 18.429 | 18.433 | 18.437 | 18.441 | 18.445 | 18.449 | 18.453 | 18.457 | 18.461 |
| 469 | 18.465 | 18.468 | 18.472 | 18.476 | 18.480 | 18.484 | 18.488 | 18.492 | 18.496 | 18.500 |
| **470** | 18.504 | 18.508 | 18.512 | 18.516 | 18.520 | 18.524 | 18.528 | 18.531 | 18.535 | 18.539 |
| 471 | 18.543 | 18.547 | 18.551 | 18.555 | 18.559 | 18.563 | 18.567 | 18.571 | 18.575 | 18.579 |
| 472 | 18.583 | 18.587 | 18.591 | 18.594 | 18.598 | 18.602 | 18.606 | 18.610 | 18.614 | 18.618 |
| 473 | 18.622 | 18.626 | 18.630 | 18.634 | 18.638 | 18.642 | 18.646 | 18.650 | 18.654 | 18.657 |
| 474 | 18.661 | 18.665 | 18.669 | 18.673 | 18.677 | 18.681 | 18.685 | 18.689 | 18.693 | 18.697 |
| **475** | 18.701 | 18.705 | 18.709 | 18.713 | 18.716 | 18.720 | 18.724 | 18.728 | 18.732 | 18.736 |
| 476 | 18.740 | 18.744 | 18.748 | 18.752 | 18.756 | 18.760 | 18.764 | 18.768 | 18.772 | 18.776 |
| 477 | 18.779 | 18.783 | 18.787 | 18.791 | 18.795 | 18.799 | 18.803 | 18.807 | 18.811 | 18.815 |
| 478 | 18.819 | 18.823 | 18.827 | 18.831 | 18.835 | 18.839 | 18.842 | 18.846 | 18.850 | 18.854 |
| 479 | 18.858 | 18.862 | 18.866 | 18.870 | 18.874 | 18.878 | 18.882 | 18.886 | 18.890 | 18.894 |
| **480** | 18.898 | 18.902 | 18.905 | 18.909 | 18.913 | 18.917 | 18.921 | 18.925 | 18.929 | 18.933 |
| 481 | 18.937 | 18.941 | 18.945 | 18.949 | 18.953 | 18.957 | 18.961 | 18.965 | 18.968 | 18.972 |
| 482 | 18.976 | 18.980 | 18.984 | 18.988 | 18.992 | 18.996 | 19.000 | 19.004 | 19.008 | 19.012 |
| 483 | 19.016 | 19.020 | 19.024 | 19.028 | 19.031 | 19.035 | 19.039 | 19.043 | 19.047 | 19.051 |
| 484 | 19.055 | 19.059 | 19.063 | 19.067 | 19.071 | 19.075 | 19.079 | 19.083 | 19.087 | 19.091 |
| **485** | 19.094 | 19.098 | 19.102 | 19.106 | 19.110 | 19.114 | 19.118 | 19.122 | 19.126 | 19.130 |
| 486 | 19.134 | 19.138 | 19.142 | 19.146 | 19.150 | 19.154 | 19.157 | 19.161 | 19.165 | 19.169 |
| 487 | 19.173 | 19.177 | 19.181 | 19.185 | 19.189 | 19.193 | 19.197 | 19.201 | 19.205 | 19.209 |
| 488 | 19.213 | 19.216 | 19.220 | 19.224 | 19.228 | 19.232 | 19.236 | 19.240 | 19.244 | 19.248 |
| 489 | 19.252 | 19.256 | 19.260 | 19.264 | 19.268 | 19.272 | 19.276 | 19.279 | 19.283 | 19.287 |
| **490** | 19.291 | 19.295 | 19.299 | 19.303 | 19.307 | 19.311 | 19.315 | 19.319 | 19.323 | 19.327 |
| 491 | 19.331 | 19.335 | 19.339 | 19.342 | 19.346 | 19.350 | 19.354 | 19.358 | 19.362 | 19.366 |
| 492 | 19.370 | 19.374 | 19.378 | 19.382 | 19.386 | 19.390 | 19.394 | 19.398 | 19.402 | 19.405 |
| 493 | 19.409 | 19.413 | 19.417 | 19.421 | 19.425 | 19.429 | 19.433 | 19.437 | 19.441 | 19.445 |
| 494 | 19.449 | 19.453 | 19.457 | 19.461 | 19.465 | 19.468 | 19.472 | 19.476 | 19.480 | 19.484 |
| **495** | 19.488 | 19.492 | 19.496 | 19.500 | 19.504 | 19.508 | 19.512 | 19.516 | 19.520 | 19.524 |
| 496 | 19.528 | 19.531 | 19.535 | 19.539 | 19.543 | 19.547 | 19.551 | 19.555 | 19.559 | 19.563 |
| 497 | 19.567 | 19.571 | 19.575 | 19.579 | 19.583 | 19.587 | 19.591 | 19.594 | 19.598 | 19.602 |
| 498 | 19.606 | 19.610 | 19.614 | 19.618 | 19.622 | 19.626 | 19.630 | 19.634 | 19.638 | 19.642 |
| 499 | 19.646 | 19.650 | 19.654 | 19.657 | 19.661 | 19.665 | 19.669 | 19.673 | 19.677 | 19.681 |
| **500** | 19.685 | 19.689 | 19.693 | 19.697 | 19.701 | 19.705 | 19.709 | 19.713 | 19.716 | 19.720 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Milli-meters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 500 | 19.685 | 19.689 | 19.693 | 19.697 | 19.701 | 19.705 | 19.709 | 19.713 | 19.716 | 19.720 |
| 501 | 19.724 | 19.728 | 19.732 | 19.736 | 19.740 | 19.744 | 19.748 | 19.752 | 19.756 | 19.760 |
| 502 | 19.764 | 19.768 | 19.772 | 19.776 | 19.779 | 19.783 | 19.787 | 19.791 | 19.795 | 19.799 |
| 503 | 19.803 | 19.807 | 19.811 | 19.815 | 19.819 | 19.823 | 19.827 | 19.831 | 19.835 | 19.839 |
| 504 | 19.842 | 19.846 | 19.850 | 19.854 | 19.858 | 19.862 | 19.866 | 19.870 | 19.874 | 19.878 |
| 505 | 19.882 | 19.886 | 19.890 | 19.894 | 19.898 | 19.902 | 19.905 | 19.909 | 19.913 | 19.917 |
| 506 | 19.921 | 19.925 | 19.929 | 19.933 | 19.937 | 19.941 | 19.945 | 19.949 | 19.953 | 19.957 |
| 507 | 19.961 | 19.965 | 19.968 | 19.972 | 19.976 | 19.980 | 19.984 | 19.988 | 19.992 | 19.996 |
| 508 | 20.000 | 20.004 | 20.008 | 20.012 | 20.016 | 20.020 | 20.024 | 20.028 | 20.031 | 20.035 |
| 509 | 20.039 | 20.043 | 20.047 | 20.051 | 20.055 | 20.059 | 20.063 | 20.067 | 20.071 | 20.075 |
| 510 | 20.079 | 20.083 | 20.087 | 20.091 | 20.094 | 20.098 | 20.102 | 20.106 | 20.110 | 20.114 |
| 511 | 20.118 | 20.122 | 20.126 | 20.130 | 20.134 | 20.138 | 20.142 | 20.146 | 20.150 | 20.154 |
| 512 | 20.157 | 20.161 | 20.165 | 20.169 | 20.173 | 20.177 | 20.181 | 20.185 | 20.189 | 20.193 |
| 513 | 20.197 | 20.201 | 20.205 | 20.209 | 20.213 | 20.216 | 20.220 | 20.224 | 20.228 | 20.232 |
| 514 | 20.236 | 20.240 | 20.244 | 20.248 | 20.252 | 20.256 | 20.260 | 20.264 | 20.268 | 20.272 |
| 515 | 20.276 | 20.279 | 20.283 | 20.287 | 20.291 | 20.295 | 20.299 | 20.303 | 20.307 | 20.311 |
| 516 | 20.315 | 20.319 | 20.323 | 20.327 | 20.331 | 20.335 | 20.339 | 20.342 | 20.346 | 20.350 |
| 517 | 20.354 | 20.358 | 20.362 | 20.366 | 20.370 | 20.374 | 20.378 | 20.382 | 20.386 | 20.390 |
| 518 | 20.394 | 20.398 | 20.402 | 20.405 | 20.409 | 20.413 | 20.417 | 20.421 | 20.425 | 20.429 |
| 519 | 20.433 | 20.437 | 20.441 | 20.445 | 20.449 | 20.453 | 20.457 | 20.461 | 20.465 | 20.468 |
| 520 | 20.472 | 20.476 | 20.480 | 20.484 | 20.488 | 20.492 | 20.496 | 20.500 | 20.504 | 20.508 |
| 521 | 20.512 | 20.516 | 20.520 | 20.524 | 20.528 | 20.531 | 20.535 | 20.539 | 20.543 | 20.547 |
| 522 | 20.551 | 20.555 | 20.559 | 20.563 | 20.567 | 20.571 | 20.575 | 20.579 | 20.583 | 20.587 |
| 523 | 20.591 | 20.594 | 20.598 | 20.602 | 20.606 | 20.610 | 20.614 | 20.618 | 20.622 | 20.626 |
| 524 | 20.630 | 20.634 | 20.638 | 20.642 | 20.646 | 20.650 | 20.654 | 20.657 | 20.661 | 20.665 |
| 525 | 20.669 | 20.673 | 20.677 | 20.681 | 20.685 | 20.689 | 20.693 | 20.697 | 20.701 | 20.705 |
| 526 | 20.709 | 20.713 | 20.716 | 20.720 | 20.724 | 20.728 | 20.732 | 20.736 | 20.740 | 20.744 |
| 527 | 20.748 | 20.752 | 20.756 | 20.760 | 20.764 | 20.768 | 20.772 | 20.776 | 20.779 | 20.783 |
| 528 | 20.787 | 20.791 | 20.795 | 20.799 | 20.803 | 20.807 | 20.811 | 20.815 | 20.819 | 20.823 |
| 529 | 20.827 | 20.831 | 20.835 | 20.839 | 20.842 | 20.846 | 20.850 | 20.854 | 20.858 | 20.862 |
| 530 | 20.866 | 20.870 | 20.874 | 20.878 | 20.882 | 20.886 | 20.890 | 20.894 | 20.898 | 20.902 |
| 531 | 20.905 | 20.909 | 20.913 | 20.917 | 20.921 | 20.925 | 20.929 | 20.933 | 20.937 | 20.941 |
| 532 | 20.945 | 20.949 | 20.953 | 20.957 | 20.961 | 20.965 | 20.968 | 20.972 | 20.976 | 20.980 |
| 533 | 20.984 | 20.988 | 20.992 | 20.996 | 21.000 | 21.004 | 21.008 | 21.012 | 21.016 | 21.020 |
| 534 | 21.024 | 21.028 | 21.031 | 21.035 | 21.039 | 21.043 | 21.047 | 21.051 | 21.055 | 21.059 |
| 535 | 21.063 | 21.067 | 21.071 | 21.075 | 21.079 | 21.083 | 21.087 | 21.091 | 21.094 | 21.098 |
| 536 | 21.102 | 21.106 | 21.110 | 21.114 | 21.118 | 21.122 | 21.126 | 21.130 | 21.134 | 21.138 |
| 537 | 21.142 | 21.146 | 21.150 | 21.154 | 21.157 | 21.161 | 21.165 | 21.169 | 21.173 | 21.177 |
| 538 | 21.181 | 21.185 | 21.189 | 21.193 | 21.197 | 21.201 | 21.205 | 21.209 | 21.213 | 21.216 |
| 539 | 21.220 | 21.224 | 21.228 | 21.232 | 21.236 | 21.240 | 21.244 | 21.248 | 21.252 | 21.256 |
| 540 | 21.260 | 21.264 | 21.268 | 21.272 | 21.276 | 21.279 | 21.283 | 21.287 | 21.291 | 21.295 |
| 541 | 21.299 | 21.303 | 21.307 | 21.311 | 21.315 | 21.319 | 21.323 | 21.327 | 21.331 | 21.335 |
| 542 | 21.339 | 21.342 | 21.346 | 21.350 | 21.354 | 21.358 | 21.362 | 21.366 | 21.370 | 21.374 |
| 543 | 21.378 | 21.382 | 21.386 | 21.390 | 21.394 | 21.398 | 21.402 | 21.405 | 21.409 | 21.413 |
| 544 | 21.417 | 21.421 | 21.425 | 21.429 | 21.433 | 21.437 | 21.441 | 21.445 | 21.449 | 21.453 |
| 545 | 21.457 | 21.461 | 21.465 | 21.468 | 21.472 | 21.476 | 21.480 | 21.484 | 21.488 | 21.492 |
| 546 | 21.496 | 21.500 | 21.504 | 21.508 | 21.512 | 21.516 | 21.520 | 21.524 | 21.528 | 21.531 |
| 547 | 21.535 | 21.539 | 21.543 | 21.547 | 21.551 | 21.555 | 21.559 | 21.563 | 21.567 | 21.571 |
| 548 | 21.575 | 21.579 | 21.583 | 21.587 | 21.591 | 21.594 | 21.598 | 21.602 | 21.606 | 21.610 |
| 549 | 21.614 | 21.618 | 21.622 | 21.626 | 21.630 | 21.634 | 21.638 | 21.642 | 21.646 | 21.650 |
| 550 | 21.654 | 21.657 | 21.661 | 21.665 | 21.669 | 21.673 | 21.677 | 21.681 | 21.685 | 21.689 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| **550** | 21.654 | 21.657 | 21.661 | 21.665 | 21.669 | 21.673 | 21.677 | 21.681 | 21.685 | 21.689 |
| 551 | 21.693 | 21.697 | 21.701 | 21.705 | 21.709 | 21.713 | 21.716 | 21.720 | 21.724 | 21.728 |
| 552 | 21.732 | 21.736 | 21.740 | 21.744 | 21.748 | 21.752 | 21.756 | 21.760 | 21.764 | 21.768 |
| 553 | 21.772 | 21.776 | 21.779 | 21.783 | 21.787 | 21.791 | 21.795 | 21.799 | 21.803 | 21.807 |
| 554 | 21.811 | 21.815 | 21.819 | 21.823 | 21.827 | 21.831 | 21.835 | 21.839 | 21.842 | 21.846 |
| **555** | 21.850 | 21.854 | 21.858 | 21.862 | 21.866 | 21.870 | 21.874 | 21.878 | 21.882 | 21.886 |
| 556 | 21.890 | 21.894 | 21.898 | 21.902 | 21.905 | 21.909 | 21.913 | 21.917 | 21.921 | 21.925 |
| 557 | 21.929 | 21.933 | 21.937 | 21.941 | 21.945 | 21.949 | 21.953 | 21.957 | 21.961 | 21.965 |
| 558 | 21.968 | 21.972 | 21.976 | 21.980 | 21.984 | 21.988 | 21.992 | 21.996 | 22.000 | 22.004 |
| 559 | 22.008 | 22.012 | 22.016 | 22.020 | 22.024 | 22.028 | 22.031 | 22.035 | 22.039 | 22.043 |
| **560** | 22.047 | 22.051 | 22.055 | 22.059 | 22.063 | 22.067 | 22.071 | 22.075 | 22.079 | 22.083 |
| 561 | 22.087 | 22.091 | 22.094 | 22.098 | 22.102 | 22.106 | 22.110 | 22.114 | 22.118 | 22.122 |
| 562 | 22.126 | 22.130 | 22.134 | 22.138 | 22.142 | 22.146 | 22.150 | 22.153 | 22.157 | 22.161 |
| 563 | 22.165 | 22.169 | 22.173 | 22.177 | 22.181 | 22.185 | 22.189 | 22.193 | 22.197 | 22.201 |
| 564 | 22.205 | 22.209 | 22.213 | 22.216 | 22.220 | 22.224 | 22.228 | 22.232 | 22.236 | 22.240 |
| **565** | 22.244 | 22.248 | 22.252 | 22.256 | 22.260 | 22.264 | 22.268 | 22.272 | 22.276 | 22.279 |
| 566 | 22.283 | 22.287 | 22.291 | 22.295 | 22.299 | 22.303 | 22 307 | 22.311 | 22.315 | 22.319 |
| 567 | 22.323 | 22.327 | 22.331 | 22.335 | 22.339 | 22.342 | 22.346 | 22.350 | 22.354 | 22.358 |
| 568 | 22.362 | 22.366 | 22.370 | 22.374 | 22.378 | 22.382 | 22.386 | 22.390 | 22.394 | 22.398 |
| 569 | 22.402 | 22.405 | 22.409 | 22.413 | 22.417 | 22.421 | 22.425 | 22.429 | 22.433 | 22.437 |
| **570** | 22.441 | 22.445 | 22.449 | 22.453 | 22.457 | 22.461 | 22.465 | 22.468 | 22.472 | 22.476 |
| 571 | 22.480 | 22.484 | 22.488 | 22.492 | 22.496 | 22.500 | 22.504 | 22.508 | 22.512 | 22.516 |
| 572 | 22.520 | 22.524 | 22.528 | 22.531 | 22.535 | 22.539 | 22.543 | 22.547 | 22.551 | 22.555 |
| 573 | 22.559 | 22.563 | 22.567 | 22.571 | 22.575 | 22.579 | 22.583 | 22.587 | 22.591 | 22.594 |
| 574 | 22.598 | 22.602 | 22.606 | 22.610 | 22.614 | 22.618 | 22.622 | 22.626 | 22.630 | 22.634 |
| **575** | 22.638 | 22.642 | 22.646 | 22.650 | 22.653 | 22.657 | 22.661 | 22.665 | 22.669 | 22.673 |
| 576 | 22.677 | 22.681 | 22.685 | 22.689 | 22.693 | 22.697 | 22.701 | 22.705 | 22.709 | 22.713 |
| 577 | 22.716 | 22.720 | 22.724 | 22.728 | 22.732 | 22.736 | 22.740 | 22.744 | 22.748 | 22.752 |
| 578 | 22.756 | 22.760 | 22.764 | 22.768 | 22.772 | 22.776 | 22.779 | 22.783 | 22.787 | 22.791 |
| 579 | 22.795 | 22.799 | 22.803 | 22.807 | 22.811 | 22.815 | 22.819 | 22.823 | 22.827 | 22.831 |
| **580** | 22.835 | 22.839 | 22.842 | 22.846 | 22.850 | 22.854 | 22.858 | 22.862 | 22.866 | 22.870 |
| 581 | 22.874 | 22.878 | 22.882 | 22.886 | 22.890 | 22.894 | 22.898 | 22.902 | 22.905 | 22.909 |
| 582 | 22.913 | 22.917 | 22.921 | 22.925 | 22.929 | 22.933 | 22.937 | 22.941 | 22.945 | 22.949 |
| 583 | 22.953 | 22.957 | 22.961 | 22.965 | 22.968 | 22.972 | 22.976 | 22.980 | 22.984 | 22.988 |
| 584 | 22.992 | 22.996 | 23.000 | 23.004 | 23.008 | 23.012 | 23.016 | 23.020 | 23.024 | 23.028 |
| **585** | 23.031 | 23.035 | 23.039 | 23.043 | 23.047 | 23.051 | 23.055 | 23.059 | 23.063 | 23.067 |
| 586 | 23.071 | 23.075 | 23.079 | 23.083 | 23.087 | 23.091 | 23.094 | 23.098 | 23.102 | 23.106 |
| 587 | 23.110 | 23.114 | 23.118 | 23.122 | 23.126 | 23.130 | 23.134 | 23.138 | 23.142 | 23.146 |
| 588 | 23.150 | 23.153 | 23.157 | 23.161 | 23.165 | 23.169 | 23.173 | 23.177 | 23.181 | 23.185 |
| 589 | 23.189 | 23.193 | 23.197 | 23.201 | 23.205 | 23.209 | 23.213 | 23.216 | 23.220 | 23.224 |
| **590** | 23.228 | 23.232 | 23.236 | 23.240 | 23.244 | 23.248 | 23.252 | 23.256 | 23.260 | 23.264 |
| 591 | 23.268 | 23.272 | 23.276 | 23.279 | 23.283 | 23.287 | 23.291 | 23.295 | 23.299 | 23.303 |
| 592 | 23.307 | 23.311 | 23.315 | 23.319 | 23.323 | 23.327 | 23.331 | 23.335 | 23.339 | 23.342 |
| 593 | 23.346 | 23.350 | 23.354 | 23.358 | 23.362 | 23.366 | 23.370 | 23.374 | 23.378 | 23.382 |
| 594 | 23.386 | 23.390 | 23.394 | 23.398 | 23.402 | 23.405 | 23.409 | 23.413 | 23.417 | 23.421 |
| **595** | 23.425 | 23.429 | 23.433 | 23.437 | 23.441 | 23.445 | 23.449 | 23.453 | 23.457 | 23.461 |
| 596 | 23.465 | 23.468 | 23.472 | 23.476 | 23.480 | 23.484 | 23.488 | 23.492 | 23.496 | 23.500 |
| 597 | 23.504 | 23.508 | 23.512 | 23.516 | 23.520 | 23.524 | 23.528 | 23.531 | 23.535 | 23.539 |
| 598 | 23.543 | 23.547 | 23.551 | 23.555 | 23.559 | 23.563 | 23.567 | 23.571 | 23.575 | 23.579 |
| 599 | 23.583 | 23.587 | 23.591 | 23.594 | 23.598 | 23.602 | 23.606 | 23.610 | 23.614 | 23.618 |
| **600** | 23.622 | 23.626 | 23.630 | 23.634 | 23.638 | 23.642 | 23.646 | 23.650 | 23.653 | 23.657 |

TABLE 10.

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| **600** | 23.622 | 23.626 | 23.630 | 23.634 | 23.638 | 23.642 | 23.646 | 23.650 | 23.653 | 23.657 |
| 601 | 23.661 | 23.665 | 23.669 | 23.673 | 23.677 | 23.681 | 23.685 | 23.689 | 23.693 | 23.697 |
| 602 | 23.701 | 23.705 | 23.709 | 23.713 | 23.716 | 23.720 | 23.724 | 23.728 | 23.732 | 23.736 |
| 603 | 23.740 | 23.744 | 23.748 | 23.752 | 23.756 | 23.760 | 23.764 | 23.768 | 23.772 | 23.776 |
| 604 | 23.779 | 23.783 | 23.787 | 23.791 | 23.795 | 23.799 | 23.803 | 23.807 | 23.811 | 23.815 |
| **605** | 23.819 | 23.823 | 23.827 | 23.831 | 23.835 | 23.839 | 23.842 | 23.846 | 23.850 | 23.854 |
| 606 | 23.858 | 23.862 | 23.866 | 23.870 | 23.874 | 23.878 | 23.882 | 23.886 | 23.890 | 23.894 |
| 607 | 23.898 | 23.902 | 23.905 | 23.909 | 23.913 | 23.917 | 23.921 | 23.925 | 23.929 | 23.933 |
| 608 | 23.937 | 23.941 | 23.945 | 23.949 | 23.953 | 23.957 | 23.961 | 23.965 | 23.968 | 23.972 |
| 609 | 23.976 | 23.980 | 23.984 | 23.988 | 23.992 | 23.996 | 24.000 | 24.004 | 24.008 | 24.012 |
| **610** | 24.016 | 24.020 | 24.024 | 24.028 | 24.031 | 24.035 | 24.039 | 24.043 | 24.047 | 24.051 |
| 611 | 24.055 | 24.059 | 24.063 | 24.067 | 24.071 | 24.075 | 24.079 | 24.083 | 24.087 | 24.091 |
| 612 | 24.094 | 24.098 | 24.102 | 24.106 | 24.110 | 24.114 | 24.118 | 24.122 | 24.126 | 24.130 |
| 613 | 24.134 | 24.138 | 24.142 | 24.146 | 24.150 | 24.153 | 24.157 | 24.161 | 24.165 | 24.169 |
| 614 | 24.173 | 24.177 | 24.181 | 24.185 | 24.189 | 24.193 | 24.197 | 24.201 | 24.205 | 24.209 |
| **615** | 24.213 | 24.216 | 24.220 | 24.224 | 24.228 | 24.232 | 24.236 | 24.240 | 24.244 | 24.248 |
| 616 | 24.252 | 24.256 | 24.260 | 24.264 | 24.268 | 24.272 | 24.276 | 24.279 | 24.283 | 24.287 |
| 617 | 24.291 | 24.295 | 24.299 | 24.303 | 24.307 | 24.311 | 24.315 | 24.319 | 24.323 | 24.327 |
| 618 | 24.331 | 24.335 | 24.339 | 24.342 | 24.346 | 24.350 | 24.354 | 24.358 | 24.362 | 24.366 |
| 619 | 24.370 | 24.374 | 24.378 | 24.382 | 24.386 | 24.390 | 24.394 | 24.398 | 24.402 | 24.405 |
| **620** | 24.409 | 24.413 | 24.417 | 24.421 | 24.425 | 24.429 | 24.433 | 24.437 | 24.441 | 24.445 |
| 621 | 24.449 | 24.453 | 24.457 | 24.461 | 24.465 | 24.468 | 24.472 | 24.476 | 24.480 | 24.484 |
| 622 | 24.488 | 24.492 | 24.496 | 24.500 | 24.504 | 24.508 | 24.512 | 24.516 | 24.520 | 24.524 |
| 623 | 24.528 | 24.531 | 24.535 | 24.539 | 24.543 | 24.547 | 24.551 | 24.555 | 24.559 | 24.563 |
| 624 | 24.567 | 24.571 | 24.575 | 24.579 | 24.583 | 24.587 | 24.591 | 24.594 | 24.598 | 24.602 |
| **625** | 24.606 | 24.610 | 24.614 | 24.618 | 24.622 | 24.626 | 24.630 | 24.634 | 24.638 | 24.642 |
| 626 | 24.646 | 24.650 | 24.653 | 24.657 | 24.661 | 24.665 | 24.669 | 24.673 | 24.677 | 24.681 |
| 627 | 24.685 | 24.689 | 24.693 | 24.697 | 24.701 | 24.705 | 24.709 | 24.713 | 24.716 | 24.720 |
| 628 | 24.724 | 24.728 | 24.732 | 24.736 | 24.740 | 24.744 | 24.748 | 24.752 | 24.756 | 24.760 |
| 629 | 24.764 | 24.768 | 24.772 | 24.776 | 24.779 | 24.783 | 24.787 | 24.791 | 24.795 | 24.799 |
| **630** | 24.803 | 24.807 | 24.811 | 24.815 | 24.819 | 24.823 | 24.827 | 24.831 | 24.835 | 24.839 |
| 631 | 24.842 | 24.846 | 24.850 | 24.854 | 24.858 | 24.862 | 24.866 | 24.870 | 24.874 | 24.878 |
| 632 | 24.882 | 24.886 | 24.890 | 24.894 | 24.898 | 24.902 | 24.905 | 24.909 | 24.913 | 24.917 |
| 633 | 24.921 | 24.925 | 24.929 | 24.933 | 24.937 | 24.941 | 24.945 | 24.949 | 24.953 | 24.957 |
| 634 | 24.961 | 24.965 | 24.968 | 24.972 | 24.976 | 24.980 | 24.984 | 24.988 | 24.992 | 24.996 |
| **635** | 25.000 | 25.004 | 25.008 | 25.012 | 25.016 | 25.020 | 25.024 | 25.028 | 25.031 | 25.035 |
| 636 | 25.039 | 25.043 | 25.047 | 25.051 | 25.055 | 25.059 | 25.063 | 25.067 | 25.071 | 25.075 |
| 637 | 25.079 | 25.083 | 25.087 | 25.091 | 25.094 | 25.098 | 25.102 | 25.106 | 25.110 | 25.114 |
| 638 | 25.118 | 25.122 | 25.126 | 25.130 | 25.134 | 25.138 | 25.142 | 25.146 | 25.150 | 25.153 |
| 639 | 25.157 | 25.161 | 25.165 | 25.169 | 25.173 | 25.177 | 25.181 | 25.185 | 25.189 | 25.193 |
| **640** | 25.197 | 25.201 | 25.205 | 25.209 | 25.213 | 25.216 | 25.220 | 25.224 | 25.228 | 25.232 |
| 641 | 25.236 | 25.240 | 25.244 | 25.248 | 25.252 | 25.256 | 25.260 | 25.264 | 25.268 | 25.272 |
| 642 | 25.276 | 25.279 | 25.283 | 25.287 | 25.291 | 25.295 | 25.299 | 25.303 | 25.307 | 25.311 |
| 643 | 25.315 | 25.319 | 25.323 | 25.327 | 25.331 | 25.335 | 25.339 | 25.342 | 25.346 | 25.350 |
| 644 | 25.354 | 25.358 | 25.362 | 25.366 | 25.370 | 25.374 | 25.378 | 25.382 | 25.386 | 25.390 |
| **645** | 25.394 | 25.398 | 25.402 | 25.405 | 25.409 | 25.413 | 25.417 | 25.421 | 25.425 | 25.429 |
| 646 | 25.433 | 25.437 | 25.441 | 25.445 | 25.449 | 25.453 | 25.457 | 25.461 | 25.465 | 25.468 |
| 647 | 25.472 | 25.476 | 25.480 | 25.484 | 25.488 | 25.492 | 25.496 | 25.500 | 25.504 | 25.508 |
| 648 | 25.512 | 25.516 | 25.520 | 25.524 | 25.528 | 25.531 | 25.535 | 25.539 | 25.543 | 25.547 |
| 649 | 25.551 | 25.555 | 25.559 | 25.563 | 25.567 | 25.571 | 25.575 | 25.579 | 25.583 | 25.587 |
| **650** | 25.591 | 25.594 | 25.598 | 25.602 | 25.606 | 25.610 | 25.614 | 25.618 | 25.622 | 25.626 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Milli-meters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 650 | 25.591 | 25.594 | 25.598 | 25.602 | 25.606 | 25.610 | 25.614 | 25.618 | 25.622 | 25.626 |
| 651 | 25.630 | 25.634 | 25.638 | 25.642 | 25.646 | 25.650 | 25.653 | 25.657 | 25.661 | 25.665 |
| 652 | 25.669 | 25.673 | 25.677 | 25.681 | 25.685 | 25.689 | 25.693 | 25.697 | 25.701 | 25.705 |
| 653 | 25.709 | 25.713 | 25.716 | 25.720 | 25.724 | 25.728 | 25.732 | 25.736 | 25.740 | 25.744 |
| 654 | 25.748 | 25.752 | 25.756 | 25.760 | 25.764 | 25.768 | 25.772 | 25.776 | 25.779 | 25.783 |
| 655 | 25.787 | 25.791 | 25.795 | 25.799 | 25.803 | 25.807 | 25.811 | 25.815 | 25.819 | 25.823 |
| 656 | 25.827 | 25.831 | 25.835 | 25.839 | 25.842 | 25.846 | 25.850 | 25.854 | 25.858 | 25.862 |
| 657 | 25.866 | 25.870 | 25.874 | 25.878 | 25.882 | 25.886 | 25.890 | 25.894 | 25.898 | 25.902 |
| 658 | 25.905 | 25.909 | 25.913 | 25.917 | 25.921 | 25.925 | 25.929 | 25.933 | 25.937 | 25.941 |
| 659 | 25.945 | 25.949 | 25.953 | 25.957 | 25.961 | 25.965 | 25.968 | 25.972 | 25.976 | 25.980 |
| 660 | 25.984 | 25.988 | 25.992 | 25.996 | 26.000 | 26.004 | 26.008 | 26.012 | 26.016 | 26.020 |
| 661 | 26.024 | 26.028 | 26.031 | 26.035 | 26.039 | 26.043 | 26.047 | 26.051 | 26.055 | 26.059 |
| 662 | 26.063 | 26.067 | 26.071 | 26.075 | 26.079 | 26.083 | 26.087 | 26.090 | 26.094 | 26.098 |
| 663 | 26.102 | 26.106 | 26.110 | 26.114 | 26.118 | 26.122 | 26.126 | 26.130 | 26.134 | 26.138 |
| 664 | 26.142 | 26.146 | 26.150 | 26.153 | 26.157 | 26.161 | 26.165 | 26.169 | 26.173 | 26.177 |
| 665 | 26.181 | 26.185 | 26.189 | 26.193 | 26.197 | 26.201 | 26.205 | 26.209 | 26.213 | 26.216 |
| 666 | 26.220 | 26.224 | 26.228 | 26.232 | 26.236 | 26.240 | 26.244 | 26.248 | 26.252 | 26.256 |
| 667 | 26.260 | 26.264 | 26.268 | 26.272 | 26.276 | 26.279 | 26.283 | 26.287 | 26.291 | 26.295 |
| 668 | 26.299 | 26.303 | 26.307 | 26.311 | 26.315 | 26.319 | 26.323 | 26.327 | 26.331 | 26.335 |
| 669 | 26.339 | 26.342 | 26.346 | 26.350 | 26.354 | 26.358 | 26.362 | 26.366 | 26.370 | 26.374 |
| 670 | 26.378 | 26.382 | 26.386 | 26.390 | 26.394 | 26.398 | 26.402 | 26.405 | 26.409 | 26.413 |
| 671 | 26.417 | 26.421 | 26.425 | 26.429 | 26.433 | 26.437 | 26.441 | 26.445 | 26.449 | 26.453 |
| 672 | 26.457 | 26.461 | 26.465 | 26.468 | 26.472 | 26.476 | 26.480 | 26.484 | 26.488 | 26.492 |
| 673 | 26.496 | 26.500 | 26.504 | 26.508 | 26.512 | 26.516 | 26.520 | 26.524 | 26.528 | 26.531 |
| 674 | 26.535 | 26.539 | 26.543 | 26.547 | 26.551 | 26.555 | 26.559 | 26.563 | 26.567 | 26.571 |
| 675 | 26.575 | 26.579 | 26.583 | 26.587 | 26.590 | 26.594 | 26.598 | 26.602 | 26.606 | 26.610 |
| 676 | 26.614 | 26.618 | 26.622 | 26.626 | 26.630 | 26.634 | 26.638 | 26.642 | 26.646 | 26.650 |
| 677 | 26.653 | 26.657 | 26.661 | 26.665 | 26.669 | 26.673 | 26.677 | 26.681 | 26.685 | 26.689 |
| 678 | 26.693 | 26.697 | 26.701 | 26.705 | 26.709 | 26.713 | 26.716 | 26.720 | 26.724 | 26.728 |
| 679 | 26.732 | 26.736 | 26.740 | 26.744 | 26.748 | 26.752 | 26.756 | 26.760 | 26.764 | 26.768 |
| 680 | 26.772 | 26.776 | 26.779 | 26.783 | 26.787 | 26.791 | 26.795 | 26 799 | 26.803 | 26.807 |
| 681 | 26.811 | 26.815 | 26.819 | 26.823 | 26.827 | 26.831 | 26.835 | 26.838 | 26.842 | 26.846 |
| 682 | 26.850 | 26.854 | 26.858 | 26.862 | 26.866 | 26.870 | 26.874 | 26.878 | 26.882 | 26.886 |
| 683 | 26.890 | 26.894 | 26.898 | 26.902 | 26.905 | 26.909 | 26.913 | 26.917 | 26.921 | 26.925 |
| 684 | 26.929 | 26.933 | 26.937 | 26.941 | 26.945 | 26.949 | 26.953 | 26.957 | 26.961 | 26.965 |
| 685 | 26.968 | 26.972 | 26.976 | 26.980 | 26.984 | 26.988 | 26.992 | 26.996 | 27.000 | 27.004 |
| 686 | 27.008 | 27.012 | 27.016 | 27.020 | 27.024 | 27.028 | 27.031 | 27.035 | 27.039 | 27.043 |
| 687 | 27.047 | 27.051 | 27.055 | 27.059 | 27.063 | 27.067 | 27.071 | 27.075 | 27.079 | 27.083 |
| 688 | 27.087 | 27.090 | 27.094 | 27.098 | 27.102 | 27.106 | 27.110 | 27.114 | 27.118 | 27.122 |
| 689 | 27.126 | 27.130 | 27.134 | 27.138 | 27.142 | 27.146 | 27.150 | 27.153 | 27.157 | 27.161 |
| 690 | 27.165 | 27.169 | 27.173 | 27.177 | 27.181 | 27.185 | 27.189 | 27.193 | 27.197 | 27.201 |
| 691 | 27.205 | 27.209 | 27.213 | 27.216 | 27.220 | 27.224 | 27.228 | 27.232 | 27.236 | 27.240 |
| 692 | 27.244 | 27.248 | 27.252 | 27.256 | 27.260 | 27.264 | 27.268 | 27.272 | 27.276 | 27.279 |
| 693 | 27.283 | 27.287 | 27.291 | 27.295 | 27.299 | 27.303 | 27.307 | 27.311 | 27.315 | 27.319 |
| 694 | 27.323 | 27.327 | 27.331 | 27.335 | 27.339 | 27.342 | 27.346 | 27.350 | 27.354 | 27.358 |
| 695 | 27.362 | 27.366 | 27.370 | 27.374 | 27.378 | 27.382 | 27.386 | 27.390 | 27.394 | 27.398 |
| 696 | 27.402 | 27.405 | 27.409 | 27.413 | 27.417 | 27.421 | 27.425 | 27.429 | 27.433 | 27.437 |
| 697 | 27.441 | 27.445 | 27.449 | 27.453 | 27.457 | 27.461 | 27.465 | 27.468 | 27.472 | 27.476 |
| 698 | 27.480 | 27.484 | 27.488 | 27.492 | 27.496 | 27.500 | 27.504 | 27.508 | 27.512 | 27.516 |
| 699 | 27.520 | 27.524 | 27.528 | 27.531 | 27.535 | 27.539 | 27.543 | 27.547 | 27.551 | 27.555 |
| 700 | 27.559 | 27.563 | 27.567 | 27.571 | 27.575 | 27.579 | 27.583 | 27.587 | 27.590 | 27.594 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 700 | 27.559 | 27.563 | 27.567 | 27.571 | 27.575 | 27.579 | 27.583 | 27.587 | 27.590 | 27.594 |
| 701 | 27.598 | 27.602 | 27.606 | 27.610 | 27.614 | 27.618 | 27.622 | 27.626 | 27.630 | 27.634 |
| 702 | 27.638 | 27.642 | 27.646 | 27.650 | 27.653 | 27.657 | 27.661 | 27.665 | 27.669 | 27.673 |
| 703 | 27.677 | 27.681 | 27.685 | 27.689 | 27.693 | 27.697 | 27.701 | 27.705 | 27.709 | 27.713 |
| 704 | 27.716 | 27.720 | 27.724 | 27.728 | 27.732 | 27.736 | 27.740 | 27.744 | 27.748 | 27.752 |
| 705 | 27.756 | 27.760 | 27.764 | 27.768 | 27.772 | 27.776 | 27.779 | 27.783 | 27.787 | 27.791 |
| 706 | 27.795 | 27.799 | 27.803 | 27.807 | 27.811 | 27.815 | 27.819 | 27.823 | 27.827 | 27.831 |
| 707 | 27.835 | 27.839 | 27.842 | 27.846 | 27.850 | 27.854 | 27.858 | 27.862 | 27.866 | 27.870 |
| 708 | 27.874 | 27.878 | 27.882 | 27.886 | 27.890 | 27.894 | 27.898 | 27.902 | 27.905 | 27.909 |
| 709 | 27.913 | 27.917 | 27.921 | 27.925 | 27.929 | 27.933 | 27.937 | 27.941 | 27.945 | 27.949 |
| 710 | 27.953 | 27.957 | 27.961 | 27.965 | 27.968 | 27.972 | 27.976 | 27.980 | 27.984 | 27.988 |
| 711 | 27.992 | 27.996 | 28.000 | 28.004 | 28.008 | 28.012 | 28.016 | 28.020 | 28.024 | 28.028 |
| 712 | 28.031 | 28.035 | 28.039 | 28.043 | 28.047 | 28.051 | 28.055 | 28.059 | 28.063 | 28.067 |
| 713 | 28.071 | 28.075 | 28.079 | 28.083 | 28.087 | 28.090 | 28.094 | 28.098 | 28.102 | 28.106 |
| 714 | 28.110 | 28.114 | 28.118 | 28.122 | 28.126 | 28.130 | 28.134 | 28.138 | 28.142 | 28.146 |
| 715 | 28.150 | 28.153 | 28.157 | 28.161 | 28.165 | 28.169 | 28.173 | 28.177 | 28.181 | 28.185 |
| 716 | 28.189 | 28.193 | 28.197 | 28.201 | 28.205 | 28.209 | 28.213 | 28.216 | 28.220 | 28.224 |
| 717 | 28.228 | 28.232 | 28.236 | 28.240 | 28.244 | 28.248 | 28.252 | 28.256 | 28.260 | 28.264 |
| 718 | 28.268 | 28.272 | 28.276 | 28.279 | 28.283 | 28.287 | 28.291 | 28.295 | 28.299 | 28.303 |
| 719 | 28.307 | 28.311 | 28.315 | 28.319 | 28.323 | 28.327 | 28.331 | 28.335 | 28.339 | 28.342 |
| 720 | 28.346 | 28.350 | 28.354 | 28.358 | 28.362 | 28.366 | 28.370 | 28.374 | 28.378 | 28.382 |
| 721 | 28.386 | 28.390 | 28.394 | 28.398 | 28.402 | 28.405 | 28.409 | 28.413 | 28.417 | 28.421 |
| 722 | 28.425 | 28.429 | 28.433 | 28.437 | 28.441 | 28.445 | 28.449 | 28.453 | 28.457 | 28.461 |
| 723 | 28.465 | 28.468 | 28.472 | 28.476 | 28.480 | 28.484 | 28.488 | 28.492 | 28.496 | 28.500 |
| 724 | 28.504 | 28.508 | 28.512 | 28.516 | 28.520 | 28.524 | 28.528 | 28.531 | 28.535 | 28.539 |
| 725 | 28.543 | 28.547 | 28.551 | 28.555 | 28.559 | 28.563 | 28.567 | 28.571 | 28.575 | 28.579 |
| 726 | 28.583 | 28.587 | 28.590 | 28.594 | 28.598 | 28.602 | 28.606 | 28.610 | 28.614 | 28.618 |
| 727 | 28.622 | 28.626 | 28.630 | 28.634 | 28.638 | 28.642 | 28.646 | 28.650 | 28.653 | 28.657 |
| 728 | 28.661 | 28.665 | 28.669 | 28.673 | 28.677 | 28.681 | 28.685 | 28.689 | 28.693 | 28.697 |
| 729 | 28.701 | 28.705 | 28.709 | 28.713 | 28.716 | 28.720 | 28.724 | 28.728 | 28.732 | 28.736 |
| 730 | 28.740 | 28.744 | 28.748 | 28.752 | 28.756 | 28.760 | 28.764 | 28.768 | 28.772 | 28.776 |
| 731 | 28.779 | 28.783 | 28.787 | 28.791 | 28.795 | 28.799 | 28.803 | 28.807 | 28.811 | 28.815 |
| 732 | 28.819 | 28.823 | 28.827 | 28.831 | 28.835 | 28.839 | 28.842 | 28.846 | 28.850 | 28.854 |
| 733 | 28.858 | 28.862 | 28.866 | 28.870 | 28.874 | 28.878 | 28.882 | 28.886 | 28.890 | 28.894 |
| 734 | 28.898 | 28.902 | 28.905 | 28.909 | 28.913 | 28.917 | 28.921 | 28.925 | 28.929 | 28.933 |
| 735 | 28.937 | 28.941 | 28.945 | 28.949 | 28.953 | 28.957 | 28.961 | 28.965 | 28.968 | 28.972 |
| 736 | 28.976 | 28.980 | 28.984 | 28.988 | 28.992 | 28.996 | 29.000 | 29.004 | 29.008 | 29.012 |
| 737 | 29.016 | 29.020 | 29.024 | 29.028 | 29.031 | 29.035 | 29.039 | 29.043 | 29.047 | 29.051 |
| 738 | 29.055 | 29.059 | 29.063 | 29.067 | 29.071 | 29.075 | 29.079 | 29.083 | 29.087 | 29.090 |
| 739 | 29.094 | 29.098 | 29.102 | 29.106 | 29.110 | 29.114 | 29.118 | 29.122 | 29.126 | 29.130 |
| 740 | 29.134 | 29.138 | 29.142 | 29.146 | 29.150 | 29.153 | 29.157 | 29.161 | 29.165 | 29.169 |
| 741 | 29.173 | 29.177 | 29.181 | 29.185 | 29.189 | 29.193 | 29.197 | 29.201 | 29.205 | 29.209 |
| 742 | 29.213 | 29.216 | 29.220 | 29.224 | 29.228 | 29.232 | 29.236 | 29.240 | 29.244 | 29.248 |
| 743 | 29.252 | 29.256 | 29.260 | 29.264 | 29.268 | 29.272 | 29.276 | 29.279 | 29.283 | 29.287 |
| 744 | 29.291 | 29.295 | 29.299 | 29.303 | 29.307 | 29.311 | 29.315 | 29.319 | 29.323 | 29.327 |
| 745 | 29.331 | 29.335 | 29.339 | 29.342 | 29.346 | 29.350 | 29.354 | 29.358 | 29.362 | 29.366 |
| 746 | 29.370 | 29.374 | 29.378 | 29.382 | 29.386 | 29.390 | 29.394 | 29.398 | 29.402 | 29.405 |
| 747 | 29.409 | 29.413 | 29.417 | 29.421 | 29.425 | 29.429 | 29.433 | 29.437 | 29.441 | 29.445 |
| 748 | 29.449 | 29.453 | 29.457 | 29.461 | 29.465 | 29.468 | 29.472 | 29.476 | 29.480 | 29.484 |
| 749 | 29.488 | 29.492 | 29.496 | 29.500 | 29.504 | 29.508 | 29.512 | 29.516 | 29.520 | 29.524 |
| 750 | 29.528 | 29.531 | 29.535 | 29.539 | 29.543 | 29.547 | 29.551 | 29.555 | 29.559 | 29.563 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 750 | 29.528 | 29.531 | 29.535 | 29.539 | 29.543 | 29.547 | 29.551 | 29.555 | 29.559 | 29.563 |
| 751 | 29.567 | 29.571 | 29.575 | 29.579 | 29.583 | 29.587 | 29.590 | 29.594 | 29.598 | 29.602 |
| 752 | 29.606 | 29.610 | 29.614 | 29.618 | 29.622 | 29.626 | 29.630 | 29.634 | 29.638 | 29.642 |
| 753 | 29.646 | 29.650 | 29.653 | 29.657 | 29.661 | 29.665 | 29.669 | 29.673 | 29.677 | 29.681 |
| 754 | 29.685 | 29.689 | 29.693 | 29.697 | 29.701 | 29.705 | 29.709 | 29.713 | 29.716 | 29.720 |
| 755 | 29.724 | 29.728 | 29.732 | 29.736 | 29.740 | 29.744 | 29.748 | 29.752 | 29.756 | 29.760 |
| 756 | 29.764 | 29.768 | 29.772 | 29.776 | 29.779 | 29.783 | 29.787 | 29.791 | 29.795 | 29.799 |
| 757 | 29.803 | 29.807 | 29.811 | 29.815 | 29.819 | 29.823 | 29.827 | 29.831 | 29.835 | 29.839 |
| 758 | 29.842 | 29.846 | 29 850 | 29.854 | 29.858 | 29.862 | 29.866 | 29.870 | 29.874 | 29.878 |
| 759 | 29.882 | 29.886 | 29.890 | 29.894 | 29.898 | 29.902 | 29.905 | 29.909 | 29.913 | 29.917 |
| 760 | 29.921 | 29.925 | 29.929 | 29.933 | 29.937 | 29.941 | 29.945 | 29.949 | 29.953 | 29.957 |
| 761 | 29.961 | 29.965 | 29.968 | 29.972 | 29.976 | 29.980 | 29.984 | 29.988 | 29.992 | 29.996 |
| 762 | 30.000 | 30.004 | 30.008 | 30.012 | 30.016 | 30.020 | 30.024 | 30.027 | 30.031 | 30.035 |
| 763 | 30.039 | 30.043 | 30.047 | 30.051 | 30.055 | 30.059 | 30.063 | 30.067 | 30.071 | 30.075 |
| 764 | 30.079 | 30.083 | 30.087 | 30.090 | 30.094 | 30.098 | 30.102 | 30.106 | 30.110 | 30.114 |
| 765 | 30.118 | 30.122 | 30.126 | 30.130 | 30.134 | 30.138 | 30.142 | 30.146 | 30.150 | 30.153 |
| 766 | 30.157 | 30.161 | 30.165 | 30.169 | 30.173 | 30.177 | 30.181 | 30.185 | 30.189 | 30.193 |
| 767 | 30.197 | 30.201 | 30.205 | 30.209 | 30.213 | 30.216 | 30.220 | 30.224 | 30.228 | 30.232 |
| 768 | 30.236 | 30.240 | 30.244 | 30.248 | 30.252 | 30.256 | 30.260 | 30.264 | 30.268 | 30.272 |
| 769 | 30.276 | 30.279 | 30.283 | 30.287 | 30.291 | 30.295 | 30.299 | 30.303 | 30.307 | 30.311 |
| 770 | 30.315 | 30.319 | 30.323 | 30.327 | 30.331 | 30.335 | 30.339 | 30.342 | 30.346 | 30.350 |
| 771 | 30.354 | 30.358 | 30.362 | 30.366 | 30.370 | 30.374 | 30.378 | 30.382 | 30.386 | 30.390 |
| 772 | 30.394 | 30.398 | 30.402 | 30.405 | 30.409 | 30.413 | 30.417 | 30.421 | 30.425 | 30.429 |
| 773 | 30.433 | 30.437 | 30.441 | 30.445 | 30.449 | 30.453 | 30.457 | 30.461 | 30.465 | 30.468 |
| 774 | 30.472 | 30.476 | 30.480 | 30.484 | 30.488 | 30.492 | 30.496 | 30.500 | 30.504 | 30.508 |
| 775 | 30.512 | 30.516 | 30.520 | 30.524 | 30.528 | 30.531 | 30.535 | 30.539 | 30.543 | 30.547 |
| 776 | 30.551 | 30.555 | 30.559 | 30.563 | 30.567 | 30.571 | 30.575 | 30.579 | 30.583 | 30.587 |
| 777 | 30.590 | 30.594 | 30.598 | 30.602 | 30.606 | 30.610 | 30.614 | 30.618 | 30.622 | 30.626 |
| 778 | 30.630 | 30.634 | 30.638 | 30.642 | 30.646 | 30.650 | 30.653 | 30.657 | 30.661 | 30.665 |
| 779 | 30.669 | 30.673 | 30.677 | 30.681 | 30.685 | 30.689 | 30.693 | 30.697 | 30.701 | 30.705 |
| 780 | 30.709 | 30.713 | 30.716 | 30.720 | 30.724 | 30.728 | 30.732 | 30.736 | 30.740 | 30.744 |
| 781 | 30.748 | 30.752 | 30.756 | 30.760 | 30.764 | 30.768 | 30.772 | 30.776 | 30.779 | 30.783 |
| 782 | 30.787 | 30.791 | 30.795 | 30.799 | 30.803 | 30.807 | 30.811 | 30.815 | 30.819 | 30.823 |
| 783 | 30.827 | 30.831 | 30.835 | 30.839 | 30.842 | 30.846 | 30.850 | 30.854 | 30.858 | 30.862 |
| 784 | 30.866 | 30.870 | 30.874 | 30.878 | 30.882 | 30.886 | 30.890 | 30.894 | 30.898 | 30.902 |
| 785 | 30.905 | 30.909 | 30.913 | 30.917 | 30.921 | 30.925 | 30.929 | 30.933 | 30.937 | 30.941 |
| 786 | 30.945 | 30.949 | 30.953 | 30.957 | 30.961 | 30.965 | 30.968 | 30.972 | 30.976 | 30.980 |
| 787 | 30.984 | 30.988 | 30.992 | 30.996 | 31.000 | 31.004 | 31.008 | 31.012 | 31.016 | 31.020 |
| 788 | 31.024 | 31.027 | 31.031 | 31.035 | 31.039 | 31.043 | 31.047 | 31.051 | 31.055 | 31.059 |
| 789 | 31.063 | 31.067 | 31.071 | 31.075 | 31.079 | 31.083 | 31.087 | 31.090 | 31.094 | 31.098 |
| 790 | 31.102 | 31.106 | 31.110 | 31.114 | 31.118 | 31.122 | 31.126 | 31.130 | 31.134 | 31.138 |
| 791 | 31.142 | 31.146 | 31.150 | 31.153 | 31.157 | 31.161 | 31.165 | 31.169 | 31.173 | 31.177 |
| 792 | 31.181 | 31.185 | 31.189 | 31.193 | 31.197 | 31.201 | 31.205 | 31.209 | 31.213 | 31.216 |
| 793 | 31.220 | 31.224 | 31.228 | 31.232 | 31.236 | 31.240 | 31.244 | 31.248 | 31.252 | 31.256 |
| 794 | 31.260 | 31.264 | 31.268 | 31.272 | 31.276 | 31.279 | 31.283 | 31.287 | 31.291 | 31.295 |
| 795 | 31.299 | 31.303 | 31.307 | 31.311 | 31.315 | 31.319 | 31.323 | 31.327 | 31.331 | 31.335 |
| 796 | 31.339 | 31.342 | 31.346 | 31.350 | 31.354 | 31.358 | 31.362 | 31.366 | 31.370 | 31.374 |
| 797 | 31.378 | 31.382 | 31.386 | 31.390 | 31.394 | 31.398 | 31.402 | 31.405 | 31.409 | 31.413 |
| 798 | 31.417 | 31.421 | 31.425 | 31.429 | 31.433 | 31.437 | 31.441 | 31.445 | 31.449 | 31.453 |
| 799 | 31.457 | 31.461 | 31.465 | 31.468 | 31.472 | 31.476 | 31.480 | 31.484 | 31.488 | 31.492 |
| 800 | 31.496 | 31.500 | 31.504 | 31.508 | 31.512 | 31.516 | 31.520 | 31.524 | 31.527 | 31.531 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| **800** | 31.496 | 31.500 | 31.504 | 31.508 | 31.512 | 31.516 | 31.520 | 31.524 | 31.527 | 31.531 |
| 801 | 31.535 | 31.539 | 31.543 | 31.547 | 31.551 | 31.555 | 31.559 | 31.563 | 31.567 | 31.571 |
| 802 | 31.575 | 31.579 | 31.583 | 31.587 | 31.590 | 31.594 | 31.598 | 31.602 | 31.606 | 31.610 |
| 803 | 31.614 | 31.618 | 31.622 | 31.626 | 31.630 | 31.634 | 31.638 | 31.642 | 31.646 | 31.650 |
| 804 | 31.653 | 31.657 | 31.661 | 31.665 | 31.669 | 31.673 | 31.677 | 31.681 | 31.685 | 31.689 |
| **805** | 31.693 | 31.697 | 31.701 | 31.705 | 31.709 | 31.713 | 31.716 | 31.720 | 31.724 | 31.728 |
| 806 | 31.732 | 31.736 | 31.740 | 31.744 | 31.748 | 31.752 | 31.756 | 31.760 | 31.764 | 31.768 |
| 807 | 31.772 | 31.776 | 31.779 | 31.783 | 31.787 | 31.791 | 31.795 | 31.799 | 31.803 | 31.807 |
| 808 | 31.811 | 31.815 | 31.819 | 31.823 | 31.827 | 31.831 | 31.835 | 31.839 | 31.842 | 31.846 |
| 809 | 31.850 | 31.854 | 31.858 | 31.862 | 31.866 | 31.870 | 31.874 | 31.878 | 31.882 | 31.886 |
| **810** | 31.890 | 31.894 | 31.898 | 31.902 | 31.905 | 31.909 | 31.913 | 31.917 | 31.921 | 31.925 |
| 811 | 31.929 | 31.933 | 31.937 | 31.941 | 31.945 | 31.949 | 31.953 | 31.957 | 31.961 | 31.965 |
| 812 | 31.968 | 31.972 | 31.976 | 31.980 | 31.984 | 31.988 | 31.992 | 31.996 | 32.000 | 32.004 |
| 813 | 32.008 | 32.012 | 32.016 | 32.020 | 32.024 | 32.027 | 32.031 | 32.035 | 32.039 | 32.043 |
| 814 | 32.047 | 32.051 | 32.055 | 32.059 | 32.063 | 32.067 | 32.071 | 32.075 | 32.079 | 32.083 |
| **815** | 32.087 | 32.090 | 32.094 | 32.098 | 32.102 | 32.106 | 32.110 | 32.114 | 32.118 | 32.122 |
| 816 | 32.126 | 32.130 | 32.134 | 32.138 | 32.142 | 32.146 | 32.150 | 32.153 | 32.157 | 32.161 |
| 817 | 32.165 | 32.169 | 32.173 | 32.177 | 32.181 | 32.185 | 32.189 | 32.193 | 32.197 | 32.201 |
| 818 | 32.205 | 32.209 | 32.213 | 32.216 | 32.220 | 32.224 | 32.228 | 32.232 | 32.236 | 32.240 |
| 819 | 32.244 | 32.248 | 32.252 | 32.256 | 32.260 | 32.264 | 32.268 | 32.272 | 32.276 | 32.279 |
| **820** | 32.283 | 32.287 | 32.291 | 32.295 | 32.299 | 32.303 | 32.307 | 32.311 | 32.315 | 32.319 |
| 821 | 32.323 | 32.327 | 32.331 | 32.335 | 32.339 | 32.342 | 32.346 | 32.350 | 32.354 | 32.358 |
| 822 | 32.362 | 32.366 | 32.370 | 32.374 | 32.378 | 32.382 | 32.386 | 32.390 | 32.394 | 32.398 |
| 823 | 32.402 | 32.405 | 32.409 | 32.413 | 32.417 | 32.421 | 32.425 | 32.429 | 32.433 | 32.437 |
| 824 | 32.441 | 32.445 | 32.449 | 32.453 | 32.457 | 32.461 | 32.465 | 32.468 | 32.472 | 32.476 |
| **825** | 32.480 | 32.484 | 32.488 | 32.492 | 32.496 | 32.500 | 32.504 | 32.508 | 32.512 | 32.516 |
| 826 | 32.520 | 32.524 | 32.527 | 32.531 | 32.535 | 32.539 | 32.543 | 32.547 | 32.551 | 32.555 |
| 827 | 32.559 | 32.563 | 32.567 | 32.571 | 32.575 | 32.579 | 32.583 | 32.587 | 32.590 | 32.594 |
| 828 | 32.598 | 32.602 | 32.606 | 32.610 | 32.614 | 32.618 | 32.622 | 32.626 | 32.630 | 32.634 |
| 829 | 32.638 | 32.642 | 32.646 | 32.650 | 32.653 | 32.657 | 32.661 | 32.665 | 32.669 | 32.673 |
| **830** | 32.677 | 32.681 | 32.685 | 32.689 | 32.693 | 32.697 | 32.701 | 32.705 | 32.709 | 32.713 |
| 831 | 32.716 | 32.720 | 32.724 | 32.728 | 32.732 | 32.736 | 32.740 | 32.744 | 32.748 | 32.752 |
| 832 | 32.756 | 32.760 | 32.764 | 32.768 | 32.772 | 32.776 | 32.779 | 32.783 | 32.787 | 32.791 |
| 833 | 32.795 | 32.799 | 32.803 | 32.807 | 32.811 | 32.815 | 32.819 | 32.823 | 32.827 | 32.831 |
| 834 | 32.835 | 32.839 | 32.842 | 32.846 | 32.850 | 32.854 | 32.858 | 32.862 | 32.866 | 32.870 |
| **835** | 32.874 | 32.878 | 32.882 | 32.886 | 32.890 | 32.894 | 32.898 | 32.902 | 32.905 | 32.909 |
| 836 | 32.913 | 32.917 | 32.921 | 32.925 | 32.929 | 32.933 | 32.937 | 32.941 | 32.945 | 32.949 |
| 837 | 32.953 | 32.957 | 32.961 | 32.965 | 32.968 | 32.972 | 32.976 | 32.980 | 32.984 | 32.988 |
| 838 | 32.992 | 32.996 | 33.000 | 33.004 | 33.008 | 33.012 | 33.016 | 33.020 | 33.024 | 33.027 |
| 839 | 33.031 | 33.035 | 33.039 | 33.043 | 33.047 | 33.051 | 33.055 | 33.059 | 33.063 | 33.067 |
| **840** | 33.071 | 33.075 | 33.079 | 33.083 | 33.087 | 33.090 | 33.094 | 33.098 | 33.102 | 33.106 |
| 841 | 33.110 | 33.114 | 33.118 | 33.122 | 33.126 | 33.130 | 33.134 | 33.138 | 33.142 | 33.146 |
| 842 | 33.150 | 33.153 | 33.157 | 33.161 | 33.165 | 33.169 | 33.173 | 33.177 | 33.181 | 33.185 |
| 843 | 33.189 | 33.193 | 33.197 | 33.201 | 33.205 | 33.209 | 33.213 | 33.216 | 33.220 | 33.224 |
| 844 | 33.228 | 33.232 | 33.236 | 33.240 | 33.244 | 33.248 | 33.252 | 33.256 | 33.260 | 33.264 |
| **845** | 33.268 | 33.272 | 33.276 | 33.279 | 33.283 | 33.287 | 33.291 | 33.295 | 33.299 | 33.303 |
| 846 | 33.307 | 33.311 | 33.315 | 33.319 | 33.323 | 33.327 | 33.331 | 33.335 | 33.339 | 33.342 |
| 847 | 33.346 | 33.350 | 33.354 | 33.358 | 33.362 | 33.366 | 33.370 | 33.374 | 33.378 | 33.382 |
| 848 | 33.386 | 33.390 | 33.394 | 33.398 | 33.402 | 33.405 | 33.409 | 33.413 | 33.417 | 33.421 |
| 849 | 33.425 | 33.429 | 33.433 | 33.437 | 33.441 | 33.445 | 33.449 | 33.453 | 33.457 | 33.461 |
| **850** | 33.464 | 33.468 | 33.472 | 33.476 | 33.480 | 33.484 | 33.488 | 33.492 | 33.496 | 33.500 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 850 | 33.464 | 33.468 | 33.472 | 33.476 | 33.480 | 33.484 | 33.488 | 33.492 | 33.496 | 33.500 |
| 851 | 33.504 | 33.508 | 33.512 | 33.516 | 33.520 | 33.524 | 33.527 | 33.531 | 33.535 | 33.539 |
| 852 | 33.543 | 33.547 | 33.551 | 33.555 | 33.559 | 33.563 | 33.567 | 33.571 | 33.575 | 33.579 |
| 853 | 33.583 | 33.587 | 33.590 | 33.594 | 33.598 | 33.602 | 33.606 | 33.610 | 33.614 | 33.618 |
| 854 | 33.622 | 33.626 | 33.630 | 33.634 | 33.638 | 33.642 | 33.646 | 33.650 | 33.653 | 33.657 |
| 855 | 33.661 | 33.665 | 33.669 | 33.673 | 33.677 | 33.681 | 33.685 | 33.689 | 33.693 | 33.697 |
| 856 | 33.701 | 33.705 | 33.709 | 33.713 | 33.716 | 33.720 | 33.724 | 33.728 | 33.732 | 33.736 |
| 857 | 33.740 | 33.744 | 33.748 | 33.752 | 33.756 | 33.760 | 33.764 | 33.768 | 33.772 | 33.776 |
| 858 | 33.779 | 33.783 | 33.787 | 33.791 | 33.795 | 33.799 | 33.803 | 33.807 | 33.811 | 33.815 |
| 859 | 33.819 | 33.823 | 33.827 | 33.831 | 33.835 | 33.839 | 33.842 | 33.846 | 33.850 | 33.854 |
| 860 | 33.858 | 33.862 | 33.866 | 33.870 | 33.874 | 33.878 | 33.882 | 33.886 | 33.890 | 33.894 |
| 861 | 33.898 | 33.902 | 33.905 | 33.909 | 33.913 | 33.917 | 33.921 | 33.925 | 33.929 | 33.933 |
| 862 | 33.937 | 33.941 | 33.945 | 33.949 | 33.953 | 33.957 | 33.961 | 33.964 | 33.968 | 33.972 |
| 863 | 33.976 | 33.980 | 33.984 | 33.988 | 33.992 | 33.996 | 34.000 | 34.004 | 34.008 | 34.012 |
| 864 | 34.016 | 34.020 | 34.024 | 34.027 | 34.031 | 34.035 | 34.039 | 34.043 | 34.047 | 34.051 |
| 865 | 34.055 | 34.059 | 34.063 | 34.067 | 34.071 | 34.075 | 34.079 | 34.083 | 34.087 | 34.090 |
| 866 | 34.094 | 34.098 | 34.102 | 34.106 | 34.110 | 34.114 | 34.118 | 34.122 | 34.126 | 34.130 |
| 867 | 34.134 | 34.138 | 34.142 | 34.146 | 34.150 | 34.153 | 34.157 | 34.161 | 34.165 | 34.169 |
| 868 | 34.173 | 34.177 | 34.181 | 34.185 | 34.189 | 34.193 | 34.197 | 34.201 | 34.205 | 34.209 |
| 869 | 34.213 | 34.216 | 34.220 | 34.224 | 34.228 | 34.232 | 34.236 | 34.240 | 34.244 | 34.248 |
| 870 | 34.252 | 34.256 | 34.260 | 34.264 | 34.268 | 34.272 | 34.276 | 34.279 | 34.283 | 34.287 |
| 871 | 34.291 | 34.295 | 34.299 | 34.303 | 34.307 | 34.311 | 34.315 | 34.319 | 34.323 | 34.327 |
| 872 | 34.331 | 34.335 | 34.339 | 34.342 | 34.346 | 34.350 | 34.354 | 34.358 | 34.362 | 34.366 |
| 873 | 34.370 | 34.374 | 34.378 | 34.382 | 34.386 | 34.390 | 34.394 | 34.398 | 34.402 | 34.405 |
| 874 | 34.409 | 34.413 | 34.417 | 34.421 | 34.425 | 34.429 | 34.433 | 34.437 | 34.441 | 34.445 |
| 875 | 34.449 | 34.453 | 34.457 | 34.461 | 34.464 | 24.468 | 34.472 | 34.476 | 34.480 | 34.484 |
| 876 | 34.488 | 34.492 | 34.496 | 34.500 | 34.504 | 34.508 | 34.512 | 34.516 | 34.520 | 34.524 |
| 877 | 34.527 | 34.531 | 34.535 | 34.539 | 34.543 | 34.547 | 34.551 | 34.555 | 34.559 | 34.563 |
| 878 | 34.567 | 34.571 | 34.575 | 34.579 | 34.583 | 34.587 | 34.590 | 34.594 | 34.598 | 34.602 |
| 879 | 34.606 | 34.610 | 34.614 | 34.618 | 34.622 | 34.626 | 34.630 | 34.634 | 34.638 | 34.642 |
| 880 | 34.646 | 34.650 | 34.653 | 34.657 | 34.661 | 34.665 | 34.669 | 34.673 | 34.677 | 34.681 |
| 881 | 34.685 | 34.689 | 34.693 | 34.697 | 34.701 | 34.705 | 34.709 | 34.713 | 34.716 | 34.720 |
| 882 | 34.724 | 34.728 | 34.732 | 34.736 | 34.740 | 34.744 | 34.748 | 34.752 | 34.756 | 34.760 |
| 883 | 34.764 | 34.768 | 34.772 | 34.776 | 34.779 | 34.783 | 34.787 | 34.791 | 34.795 | 34.799 |
| 884 | 34.803 | 34.807 | 34.811 | 34.815 | 34.819 | 34.823 | 34.827 | 34.831 | 34.835 | 34.839 |
| 885 | 34.842 | 34.846 | 34.850 | 34.854 | 34.858 | 34.862 | 34.866 | 34.870 | 34.874 | 34.878 |
| 886 | 34.882 | 34.886 | 34.890 | 34.894 | 34.898 | 34.902 | 34.905 | 34.909 | 34.913 | 34.917 |
| 887 | 34.921 | 34.925 | 34.929 | 34.933 | 34.937 | 34.941 | 34.945 | 34.949 | 34.953 | 34.957 |
| 888 | 34.961 | 34.964 | 34.968 | 34.972 | 34.976 | 34.980 | 34.984 | 34.988 | 34.992 | 34.996 |
| 889 | 35.000 | 35.004 | 35.008 | 35.012 | 35.016 | 35.020 | 35.024 | 35.027 | 35.031 | 35.035 |
| 890 | 35.039 | 35.043 | 35.047 | 35.051 | 35.055 | 35.059 | 35.063 | 35.067 | 35.071 | 35.075 |
| 891 | 35.079 | 35.083 | 35.087 | 35.090 | 35.094 | 35.098 | 35.102 | 35.106 | 35.110 | 35.114 |
| 892 | 35.118 | 35.122 | 35.126 | 35.130 | 35.134 | 35.138 | 35.142 | 35.146 | 35.150 | 35.153 |
| 893 | 35.157 | 35.161 | 35.165 | 35.169 | 35.173 | 35.177 | 35.181 | 35.185 | 35.189 | 35.193 |
| 894 | 35.197 | 35.201 | 35.205 | 35.209 | 35.213 | 35.216 | 35.220 | 35.224 | 35.228 | 35.232 |
| 895 | 35.236 | 35.240 | 35.244 | 35.248 | 35.252 | 35.256 | 35.260 | 35.264 | 35.268 | 35.272 |
| 896 | 35.276 | 35.279 | 35.283 | 35.287 | 35.291 | 35.295 | 35.299 | 35.303 | 35.307 | 35.311 |
| 897 | 35.315 | 35.319 | 35.323 | 35.327 | 35.331 | 35.335 | 35.339 | 35.342 | 35.346 | 35.350 |
| 898 | 35.354 | 35.358 | 35.362 | 35.366 | 35.370 | 35.374 | 35.378 | 35.382 | 35.386 | 35.390 |
| 899 | 35.394 | 35.398 | 35.402 | 35.405 | 35.409 | 35.413 | 35.417 | 35.421 | 35.425 | 35.429 |
| 900 | 35.433 | 35.437 | 35.441 | 35.445 | 35.449 | 35.453 | 35.457 | 35.461 | 35.464 | 35.468 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| **900** | 35.433 | 35.437 | 35.441 | 35.445 | 35.449 | 35.453 | 35.457 | 35.461 | 35.464 | 35.468 |
| 901 | 35.472 | 35.476 | 35.480 | 35.484 | 35.488 | 35.492 | 35.496 | 35.500 | 35.504 | 35.508 |
| 902 | 35.512 | 35.516 | 35.520 | 35.524 | 35.527 | 35.531 | 35.535 | 35.539 | 35.543 | 35.547 |
| 903 | 35.551 | 35.555 | 35.559 | 35.563 | 35.567 | 35.571 | 35.575 | 35.579 | 35.583 | 35.587 |
| 904 | 35.590 | 35.594 | 35.598 | 35.602 | 35.606 | 35.610 | 35.614 | 35.618 | 35.622 | 35.626 |
| **905** | 35.630 | 35.634 | 35.638 | 35.642 | 35.646 | 35.650 | 35.653 | 35.657 | 35.661 | 35.665 |
| 906 | 35.669 | 35.673 | 35.677 | 35.681 | 35.685 | 35.689 | 35.693 | 35.697 | 35.701 | 35.705 |
| 907 | 35.709 | 35.713 | 35.716 | 35.720 | 35.724 | 35.728 | 35.732 | 35.736 | 35.740 | 35.744 |
| 908 | 35.748 | 35.752 | 35.756 | 35.760 | 35.764 | 35.768 | 35.772 | 35.776 | 35.779 | 35.783 |
| 909 | 35.787 | 35.791 | 35.795 | 35.799 | 35.803 | 35.807 | 35.811 | 35.815 | 35.819 | 35.823 |
| **910** | 35.827 | 35.831 | 35.835 | 35.839 | 35.842 | 35.846 | 35.850 | 35.854 | 35.858 | 35.862 |
| 911 | 35.866 | 35.870 | 35.874 | 35.878 | 35.882 | 35.886 | 35.890 | 35.894 | 35.898 | 35.902 |
| 912 | 35.905 | 35.909 | 35.913 | 35.917 | 35.921 | 35.925 | 35.929 | 35.933 | 35.937 | 35.941 |
| 913 | 35.945 | 35.949 | 35.953 | 35.957 | 35.961 | 35.964 | 35.968 | 35.972 | 35.976 | 35.980 |
| 914 | 35.984 | 35.988 | 35.992 | 35.996 | 36.000 | 36.004 | 36.008 | 36.012 | 36.016 | 36.020 |
| **915** | 36.024 | 36.027 | 36.031 | 36.035 | 36.039 | 36.043 | 36.047 | 36.051 | 36.055 | 36.059 |
| 916 | 36.063 | 36.067 | 36.071 | 36.075 | 36.079 | 36.083 | 36.087 | 36.090 | 36.094 | 36.098 |
| 917 | 36.102 | 36.106 | 36.110 | 36.114 | 36.118 | 36.122 | 36.126 | 36.130 | 36.134 | 36.138 |
| 918 | 36.142 | 36.146 | 36.150 | 36.153 | 36.157 | 36.161 | 36.165 | 36.169 | 36.173 | 36.177 |
| 919 | 36.181 | 36.185 | 36.189 | 36.193 | 36.197 | 36.201 | 36.205 | 36.209 | 36.213 | 36.216 |
| **920** | 36.220 | 36.224 | 36.228 | 36.232 | 36.236 | 36.240 | 36.244 | 36.248 | 36.252 | 36.256 |
| 921 | 36.260 | 36.264 | 36.268 | 36.272 | 36.276 | 36.279 | 36.283 | 36.287 | 36.291 | 36.295 |
| 922 | 36.299 | 36.303 | 36.307 | 36.311 | 36.315 | 36.319 | 36.323 | 36.327 | 36.331 | 36.335 |
| 923 | 36.339 | 36.342 | 36.346 | 36.350 | 36.354 | 36.358 | 36.362 | 36.366 | 36.370 | 36.374 |
| 924 | 36.378 | 36.382 | 36.386 | 36.390 | 36.394 | 36.398 | 36.402 | 36.405 | 36.409 | 36.413 |
| **925** | 36.417 | 36.421 | 36.425 | 36.429 | 36.433 | 36.437 | 36.441 | 36.445 | 36.449 | 36.453 |
| 926 | 36.457 | 36.461 | 36.464 | 36.468 | 36.472 | 36.476 | 36.480 | 36.484 | 36.488 | 36.492 |
| 927 | 36.496 | 36.500 | 36.504 | 36.508 | 36.512 | 36.516 | 36.520 | 36.524 | 36.527 | 36.531 |
| 928 | 36.535 | 36.539 | 36.543 | 36.547 | 36.551 | 36.555 | 36.559 | 36.563 | 36.567 | 36.571 |
| 929 | 36.575 | 36.579 | 36.583 | 36.587 | 36.590 | 36.594 | 36.598 | 36.602 | 36.606 | 36.610 |
| **930** | 36.614 | 36.618 | 36.622 | 36.626 | 36.630 | 36.634 | 36.638 | 36.642 | 36.646 | 36.650 |
| 931 | 36.653 | 36.657 | 36.661 | 36.665 | 36.669 | 36.673 | 36.677 | 36.681 | 36.685 | 36.689 |
| 932 | 36.693 | 36.697 | 36.701 | 36.705 | 36.709 | 36.713 | 36.716 | 36.720 | 36.724 | 36.728 |
| 933 | 36.732 | 36.736 | 36.740 | 36.744 | 36.748 | 36.752 | 36.756 | 36.760 | 36.764 | 36.768 |
| 934 | 36.772 | 36.776 | 36.779 | 36.783 | 36.787 | 36.791 | 36.795 | 36.799 | 36.803 | 36.807 |
| **935** | 36.811 | 36.815 | 36.819 | 36.823 | 36.827 | 36.831 | 36.835 | 36.839 | 36.842 | 36.846 |
| 936 | 36.850 | 36.854 | 36.858 | 36.862 | 36.866 | 36.870 | 36.874 | 36.878 | 36.882 | 36.886 |
| 937 | 36.890 | 36.894 | 36.898 | 36.902 | 36.905 | 36.909 | 36.913 | 36.917 | 36.921 | 36.925 |
| 938 | 36.929 | 36.933 | 36.937 | 36.941 | 36.945 | 36.949 | 36.953 | 36.957 | 36.961 | 36.964 |
| 939 | 36.968 | 36.972 | 36.976 | 36.980 | 36.984 | 36.988 | 36.992 | 36.996 | 37.000 | 37.004 |
| **940** | 37.008 | 37.012 | 37.016 | 37.020 | 37.024 | 37.027 | 37.031 | 37.035 | 37.039 | 37.043 |
| 941 | 37.047 | 37.051 | 37.055 | 37.059 | 37.063 | 37.067 | 37.071 | 37.075 | 37.079 | 37.083 |
| 942 | 37.087 | 37.090 | 37.094 | 37.098 | 37.102 | 37.106 | 37.110 | 37.114 | 37.118 | 37.122 |
| 943 | 37.126 | 37.130 | 37.134 | 37.138 | 37.142 | 37.146 | 37.150 | 37.153 | 37.157 | 37.161 |
| 944 | 37.165 | 37.169 | 37.173 | 37.177 | 37.181 | 37.185 | 37.189 | 37.193 | 37.197 | 37.201 |
| **945** | 37.204 | 37.208 | 37.212 | 37.216 | 37.220 | 37.224 | 37.228 | 37.232 | 37.236 | 37.240 |
| 946 | 37.244 | 37.248 | 37.252 | 37.256 | 37.260 | 37.264 | 37.268 | 37.272 | 37.276 | 37.279 |
| 947 | 37.283 | 37.287 | 37.291 | 37.295 | 37.299 | 37.303 | 37.307 | 37.311 | 37.315 | 37.319 |
| 948 | 37.323 | 37.327 | 37.331 | 37.335 | 37.339 | 37.342 | 37.346 | 37.350 | 37.354 | 37.358 |
| 949 | 37.362 | 37.366 | 37.370 | 37.374 | 37.378 | 37.382 | 37.386 | 37.390 | 37.394 | 37.398 |
| **950** | 37.402 | 37.405 | 37.409 | 37.413 | 37.417 | 37.421 | 37.425 | 37.429 | 37.433 | 37.437 |

## MILLIMETERS INTO INCHES.

1 mm. = 0.03937 inch.

| Millimeters. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| **950** | 37.402 | 37.405 | 37.409 | 37.413 | 37.417 | 37.421 | 37.425 | 37.429 | 37.433 | 37.437 |
| 951 | 37.441 | 37.445 | 37.449 | 37.453 | 37.457 | 37.461 | 37.464 | 37.468 | 37.472 | 37.476 |
| 952 | 37.480 | 37.484 | 37.488 | 37.492 | 37.496 | 37.500 | 37.504 | 37.508 | 37.512 | 37.516 |
| 953 | 37.520 | 37.524 | 37.527 | 37.531 | 37.535 | 37.539 | 37.543 | 37.547 | 37.551 | 37.555 |
| 954 | 37.559 | 37.563 | 37.567 | 37.571 | 37.575 | 37.579 | 37.583 | 37.587 | 37.590 | 37.594 |
| **955** | 37.598 | 37.602 | 37.606 | 37.610 | 37.614 | 37.618 | 37.622 | 37.626 | 37.630 | 37.634 |
| 956 | 37.638 | 37.642 | 37.646 | 37.650 | 37.653 | 37.657 | 37.661 | 37.665 | 37.669 | 37.673 |
| 957 | 37.677 | 37.681 | 37.685 | 37.689 | 37.693 | 37.697 | 37.701 | 37.705 | 37.709 | 37.713 |
| 958 | 37.716 | 37.720 | 37.724 | 37.728 | 37.732 | 37.736 | 37.740 | 37.744 | 37.748 | 37.752 |
| 959 | 37.756 | 37.760 | 37.764 | 37.768 | 37.772 | 37.776 | 37.779 | 37.783 | 37.787 | 37.791 |
| **960** | 37.795 | 37.799 | 37.803 | 37.807 | 37.811 | 37.815 | 37.819 | 37.823 | 37.827 | 37.831 |
| 961 | 37.835 | 37.839 | 37.842 | 37.846 | 37.850 | 37.854 | 37.858 | 37.862 | 37.866 | 37.870 |
| 962 | 37.874 | 37.878 | 37.882 | 37.886 | 37.890 | 37.894 | 37.898 | 37.901 | 37.905 | 37.909 |
| 963 | 37.913 | 37.917 | 37.921 | 37.925 | 37.929 | 37.933 | 37.937 | 37.941 | 37.945 | 37.949 |
| 964 | 37.953 | 37.957 | 37.961 | 37.964 | 37.968 | 37.972 | 37.976 | 37.980 | 37.984 | 37.988 |
| **965** | 37.992 | 37.996 | 38.000 | 38.004 | 38.008 | 38.012 | 38.016 | 38.020 | 38.024 | 38.027 |
| 966 | 38.031 | 38.035 | 38.039 | 38.043 | 38.047 | 38.051 | 38.055 | 38.059 | 38.063 | 38.067 |
| 967 | 38.071 | 38.075 | 38.079 | 38.083 | 38.087 | 38.090 | 38.094 | 38.098 | 38.102 | 38.106 |
| 968 | 38.110 | 38.114 | 38.118 | 38.122 | 38.126 | 38.130 | 38.134 | 38.138 | 38.142 | 38.146 |
| 969 | 38.150 | 38.153 | 38.157 | 38.161 | 38.165 | 38.169 | 38.173 | 38.177 | 38.181 | 38.185 |
| **970** | 38.189 | 38.193 | 38.197 | 38.201 | 38.205 | 38.209 | 38.213 | 38.216 | 38.220 | 38.224 |
| 971 | 38.228 | 38.232 | 38.236 | 38.240 | 38.244 | 38.248 | 38.252 | 38.256 | 38.260 | 38.264 |
| 972 | 38.268 | 38.272 | 38.276 | 38.279 | 38.283 | 38.287 | 38.291 | 38.295 | 38.299 | 38.303 |
| 973 | 38.307 | 38.311 | 38.315 | 38.319 | 38.323 | 38.327 | 38.331 | 38.335 | 38.339 | 38.342 |
| 974 | 38.346 | 38.350 | 38.354 | 38.358 | 38.362 | 38.366 | 38.370 | 38.374 | 38.378 | 38.382 |
| **975** | 38.386 | 38.390 | 38.394 | 38.398 | 38.401 | 38.405 | 38.409 | 38.413 | 38.417 | 38.421 |
| 976 | 38.425 | 38.429 | 38.433 | 38.437 | 38.441 | 38.445 | 38.449 | 38.453 | 38.457 | 38.461 |
| 977 | 38.464 | 38.468 | 38.472 | 38.476 | 38.480 | 38.484 | 38.488 | 38.492 | 38.496 | 38.500 |
| 978 | 38.504 | 38.508 | 38.512 | 38.516 | 38.520 | 38.524 | 38.527 | 38.531 | 38.535 | 38.539 |
| 979 | 38.543 | 38.547 | 38.551 | 38.555 | 38.559 | 38.563 | 38.567 | 38.571 | 38.575 | 38.579 |
| **980** | 38.583 | 38.587 | 38.590 | 38.594 | 38.598 | 38.602 | 38.606 | 38.610 | 38.614 | 38.618 |
| 981 | 38.622 | 38.626 | 38.630 | 38.634 | 38.638 | 38.642 | 38.646 | 38.650 | 38.653 | 38.657 |
| 982 | 38.661 | 38.665 | 38.669 | 38.673 | 38.677 | 38.681 | 38.685 | 38.689 | 38.693 | 38.697 |
| 983 | 38.701 | 38.705 | 38.709 | 38.713 | 38.716 | 38.720 | 38.724 | 38.728 | 38.732 | 38.736 |
| 984 | 38.740 | 38.744 | 38.748 | 38.752 | 38.756 | 38.760 | 38.764 | 38.768 | 38.772 | 38.776 |
| **985** | 38.780 | 38.783 | 38.787 | 38.791 | 38.795 | 38.799 | 38.803 | 38.807 | 38.811 | 38.815 |
| 986 | 38.819 | 38.823 | 38.827 | 38.831 | 38.835 | 38.839 | 38.842 | 38.846 | 38.850 | 38.854 |
| 987 | 38.858 | 38.862 | 38.866 | 38.870 | 38.874 | 38.878 | 38.882 | 38.886 | 38.890 | 38.894 |
| 988 | 38.898 | 38.901 | 38.905 | 38.909 | 38.913 | 38.917 | 38.921 | 38.925 | 38.929 | 38.933 |
| 989 | 38.937 | 38.941 | 38.945 | 38.949 | 38.953 | 38.957 | 38.961 | 38.964 | 38.968 | 38.972 |
| **990** | 38.976 | 38.980 | 38.984 | 38.988 | 38.992 | 38.996 | 39.000 | 39.004 | 39.008 | 39.012 |
| 991 | 39.016 | 39.020 | 39.024 | 39.027 | 39.031 | 39.035 | 39.039 | 39.043 | 39.047 | 39.051 |
| 992 | 39.055 | 39.059 | 39.063 | 39.067 | 39.071 | 39.075 | 39.079 | 39.083 | 39.087 | 39.090 |
| 993 | 39.094 | 39.098 | 39.102 | 39.106 | 39.110 | 39.114 | 39.118 | 39.122 | 39.126 | 39.130 |
| 994 | 39.134 | 39.138 | 39.142 | 39.146 | 39.150 | 39.153 | 39.157 | 39.161 | 39.165 | 39.169 |
| **995** | 39.173 | 39.177 | 39.181 | 39.185 | 39.189 | 39.193 | 39.197 | 39.201 | 39.205 | 39.209 |
| 996 | 39.213 | 39.216 | 39.220 | 39.224 | 39.228 | 39.232 | 39.236 | 39.240 | 39.244 | 39.248 |
| 997 | 39.252 | 39.256 | 39.260 | 39.264 | 39.268 | 39.272 | 39.276 | 39.279 | 39.283 | 39.287 |
| 998 | 39.291 | 39.295 | 39.299 | 39.303 | 39.307 | 39.311 | 39.315 | 39.319 | 39.323 | 39.327 |
| 999 | 39.331 | 39.335 | 39.339 | 39.342 | 39.346 | 39.350 | 39.354 | 39.358 | 39.362 | 39.366 |
| **1000** | 39.370 | 39.374 | 39.378 | 39.382 | 39.386 | 39.390 | 39.394 | 39.398 | 39.401 | 39.405 |

## BAROMETRIC INCHES (MERCURY) INTO MILLIBARS.

1 inch = 33.86395 mb.

| Inches | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. |
| 0.0 | 0.00 | 0.34 | 0.68 | 1.02 | 1.35 | 1.69 | 2.03 | 2.37 | 2.71 | 3.05 |
| 0.1 | 3.39 | 3.73 | 4.06 | 4.40 | 4.74 | 5.08 | 5.42 | 5.76 | 6.10 | 6.43 |
| 0.2 | 6.77 | 7.11 | 7.45 | 7.79 | 8.13 | 8.47 | 8.80 | 9.14 | 9.48 | 9.82 |
| 0.3 | 10.16 | 10.50 | 10.84 | 11.18 | 11.51 | 11.85 | 12.19 | 12.53 | 12.87 | 13.21 |
| 0.4 | 13.55 | 13.88 | 14.22 | 14.56 | 14.90 | 15.24 | 15.58 | 15.92 | 16.25 | 16.59 |
| 0.5 | 16.93 | 17.27 | 17.61 | 17.95 | 18.29 | 18.63 | 18.96 | 19.30 | 19.64 | 19.98 |
| 0.6 | 20.32 | 20.66 | 21.00 | 21.33 | 21.67 | 22.01 | 22.35 | 22.69 | 23.03 | 23.37 |
| 0.7 | 23.70 | 24.04 | 24.38 | 24.72 | 25.06 | 25.40 | 25.74 | 26.08 | 26.41 | 26.75 |
| 0.8 | 27.09 | 27.43 | 27.77 | 28.11 | 28.45 | 28.78 | 29.12 | 29.46 | 29.80 | 30.14 |
| 0.9 | 30.48 | 30.82 | 31.15 | 31.49 | 31.83 | 32.17 | 32.51 | 32.85 | 33.19 | 33.53 |
| 1.0 | 33.86 | 34.20 | 34.54 | 34.88 | 35.22 | 35.56 | 35.90 | 36.23 | 36.57 | 36.91 |
| 1.1 | 37.25 | 37.59 | 37.93 | 38.27 | 38.60 | 38.94 | 39.28 | 39.62 | 39.96 | 40.30 |
| 1.2 | 40.64 | 40.98 | 41.31 | 41.65 | 41.99 | 42.33 | 42.67 | 43.01 | 43.35 | 43.68 |
| 1.3 | 44.02 | 44.36 | 44.70 | 45.04 | 45.38 | 45.72 | 46.05 | 46.39 | 46.73 | 47.07 |
| 1.4 | 47.41 | 47.75 | 48.09 | 48.43 | 48.76 | 49.10 | 49.44 | 49.78 | 50.12 | 50.46 |
| 1.5 | 50.80 | 51.13 | 51.47 | 51.81 | 52.15 | 52.49 | 52.83 | 53.17 | 53.51 | 53.84 |
| 1.6 | 54.18 | 54.52 | 54.86 | 55.20 | 55.54 | 55.88 | 56.21 | 56.55 | 56.89 | 57.23 |
| 1.7 | 57.57 | 57.91 | 58.25 | 58.58 | 58.92 | 59.26 | 59.60 | 59.94 | 60.28 | 60.62 |
| 1.8 | 60.96 | 61.29 | 61.63 | 61.97 | 62.31 | 62.65 | 62.99 | 63.33 | 63.66 | 64.00 |
| 1.9 | 64.34 | 64.68 | 65.02 | 65.36 | 65.70 | 66.03 | 66.37 | 66.71 | 67.05 | 67.39 |
| 2.0 | 67.73 | 68.07 | 68.41 | 68.74 | 69.08 | 69.42 | 69.76 | 70.10 | 70.44 | 70.78 |
| 2.1 | 71.11 | 71.45 | 71.79 | 72.13 | 72.47 | 72.81 | 73.15 | 73.48 | 73.82 | 74.16 |
| 2.2 | 74.50 | 74.84 | 75.18 | 75.52 | 75.86 | 76.19 | 76.53 | 76.87 | 77.21 | 77.55 |
| 2.3 | 77.89 | 78.23 | 78.56 | 78.90 | 79.24 | 79.58 | 79.92 | 80.26 | 80.60 | 80.93 |
| 2.4 | 81.27 | 81.61 | 81.95 | 82.29 | 82.63 | 82.97 | 83.31 | 83.64 | 83.98 | 84.32 |
| 25.0 | 846.6 | 846.9 | 847.3 | 847.6 | 848.0 | 848.3 | 848.6 | 849.0 | 849.3 | 849.6 |
| 25.1 | 850.0 | 850.3 | 850.7 | 851.0 | 851.3 | 851.7 | 852.0 | 852.4 | 852.7 | 853.0 |
| 25.2 | 853.4 | 853.7 | 854.0 | 854.4 | 854.7 | 855.1 | 855.4 | 855.7 | 856.1 | 856.4 |
| 25.3 | 856.8 | 857.1 | 857.4 | 857.8 | 858.1 | 858.5 | 858.8 | 859.1 | 859.5 | 859.8 |
| 25.4 | 860.1 | 860.5 | 860.8 | 861.2 | 861.5 | 861.8 | 862.2 | 862.5 | 862.9 | 863.2 |
| 25.5 | 863.5 | 863.9 | 864.2 | 864.5 | 864.9 | 865.2 | 865.6 | 865.9 | 866.2 | 866.6 |
| 25.6 | 866.9 | 867.3 | 867.6 | 867.9 | 868.3 | 868.6 | 868.9 | 869.3 | 869.6 | 870.0 |
| 25.7 | 870.3 | 870.7 | 871.0 | 871.3 | 871.7 | 872.0 | 872.3 | 872.7 | 873.0 | 873.4 |
| 25.8 | 873.7 | 874.0 | 874.4 | 874.7 | 875.0 | 875.4 | 875.7 | 876.1 | 876.4 | 876.7 |
| 25.9 | 877.1 | 877.4 | 877.8 | 878.1 | 878.4 | 878.8 | 879.1 | 879.4 | 879.8 | 880.1 |
| 26.0 | 880.5 | 880.8 | 881.1 | 881.5 | 881.8 | 882.2 | 882.5 | 882.8 | 883.2 | 883.5 |
| 26.1 | 883.8 | 884.2 | 884.5 | 884.9 | 885.2 | 885.5 | 885.9 | 886.2 | 886.6 | 886.9 |
| 26.2 | 887.2 | 887.6 | 887.9 | 888.3 | 888.6 | 888.9 | 889.3 | 889.6 | 889.9 | 890.3 |
| 26.3 | 890.6 | 891.0 | 891.3 | 891.6 | 892.0 | 892.3 | 892.7 | 893.0 | 893.3 | 893.7 |
| 26.4 | 894.0 | 894.3 | 894.7 | 895.0 | 895.4 | 895.7 | 896.0 | 896.4 | 896.7 | 897.1 |
| 26.5 | 897.4 | 897.7 | 898.1 | 898.4 | 898.7 | 899.1 | 899.4 | 899.8 | 900.1 | 900.4 |
| 26.6 | 900.8 | 901.1 | 901.5 | 901.8 | 902.1 | 902.5 | 902.8 | 903.2 | 903.5 | 903.8 |
| 26.7 | 904.2 | 904.5 | 904.8 | 905.2 | 905.5 | 905.9 | 906.2 | 906.5 | 906.9 | 907.2 |
| 26.8 | 907.6 | 907.9 | 908.2 | 908.6 | 908.9 | 909.2 | 909.6 | 909.9 | 910.3 | 910.6 |
| 26.9 | 910.9 | 911.3 | 911.6 | 912.0 | 912.3 | 912.6 | 913.0 | 913.3 | 913.6 | 914.0 |
| 27.0 | 914.3 | 914.7 | 915.0 | 915.3 | 915.7 | 916.0 | 916.4 | 916.7 | 917.0 | 917.4 |
| 27.1 | 917.7 | 918.1 | 918.4 | 918.7 | 919.1 | 919.4 | 919.7 | 920.1 | 920.4 | 920.8 |
| 27.2 | 921.1 | 921.4 | 921.8 | 922.1 | 922.5 | 922.8 | 923.1 | 923.5 | 923.8 | 924.1 |
| 27.3 | 924.5 | 924.8 | 925.2 | 925.5 | 925.8 | 926.2 | 926.5 | 926.9 | 927.2 | 927.5 |
| 27.4 | 927.9 | 928.2 | 928.5 | 928.9 | 929.2 | 929.6 | 929.9 | 930.2 | 930.6 | 930.9 |

## BAROMETRIC INCHES (MERCURY) INTO MILLIBARS.

1 inch = 33.86395 mb.

| Inches. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. |
| 27.5 | 931.3 | 931.6 | 931.9 | 932.3 | 932.6 | 933.0 | 933.3 | 933.6 | 934.0 | 934.3 |
| 27.6 | 934.6 | 935.0 | 935.3 | 935.7 | 936.0 | 936.3 | 936.7 | 937.0 | 937.4 | 937.7 |
| 27.7 | 938.0 | 938.4 | 938.7 | 939.0 | 939.4 | 939.7 | 940.1 | 940.4 | 940.7 | 941.1 |
| 27.8 | 941.4 | 941.8 | 942.1 | 942.4 | 942.8 | 943.1 | 943.4 | 943.8 | 944.1 | 944.5 |
| 27.9 | 944.8 | 945.1 | 945.5 | 945.8 | 946.2 | 946.5 | 946.8 | 947.2 | 947.5 | 947.9 |
| 28.0 | 948.2 | 948.5 | 948.9 | 949.2 | 949.5 | 949.9 | 950.2 | 950.6 | 950.9 | 951.2 |
| 28.1 | 951.6 | 951.9 | 952.3 | 952.6 | 952.9 | 953.3 | 953.6 | 953.9 | 954.3 | 954.6 |
| 28.2 | 955.0 | 955.3 | 955.6 | 956.0 | 956.3 | 956.7 | 957.0 | 957.3 | 957.7 | 958.0 |
| 28.3 | 958.3 | 958.7 | 959.0 | 959.4 | 959.7 | 960.0 | 960.4 | 960.7 | 961.1 | 961.4 |
| 28.4 | 961.7 | 962.1 | 962.4 | 962.8 | 963.1 | 963.4 | 963.8 | 964.1 | 964.4 | 964.8 |
| 28.5 | 965.1 | 965.5 | 965.8 | 966.1 | 966.5 | 966.8 | 967.2 | 967.5 | 967.8 | 968.2 |
| 28.6 | 968.5 | 968.8 | 969.2 | 969.5 | 969.9 | 970.2 | 970.5 | 970.9 | 971.2 | 971.6 |
| 28.7 | 971.9 | 972.2 | 972.6 | 972.9 | 973.2 | 973.6 | 973.9 | 974.3 | 974.6 | 974.9 |
| 28.8 | 975.3 | 975.6 | 976.0 | 976.3 | 976.6 | 977.0 | 977.3 | 977.7 | 978.0 | 978.3 |
| 28.9 | 978.7 | 979.0 | 979.3 | 979.7 | 980.0 | 980.4 | 980.7 | 981.0 | 981.4 | 981.7 |
| 29.0 | 982.1 | 982.4 | 982.7 | 983.1 | 983.4 | 983.7 | 984.1 | 984.4 | 984.8 | 985.1 |
| 29.1 | 985.4 | 985.8 | 986.1 | 986.5 | 986.8 | 987.1 | 987.5 | 987.8 | 988.2 | 988.5 |
| 29.2 | 988.8 | 989.2 | 989.5 | 989.8 | 990.2 | 990.5 | 990.9 | 991.2 | 991.5 | 991.9 |
| 29.3 | 992.2 | 992.6 | 992.9 | 993.2 | 993.6 | 993.9 | 994.2 | 994.6 | 994.9 | 995.3 |
| 29.4 | 995.6 | 995.9 | 996.3 | 996.6 | 997.0 | 997.3 | 997.6 | 998.0 | 998.3 | 998.6 |
| 29.5 | 999.0 | 999.3 | 999.7 | 1000.0 | 1000.4 | 1000.7 | 1001.0 | 1001.4 | 1001.7 | 1002.0 |
| 29.6 | 1002.4 | 1002.7 | 1003.1 | 1003.4 | 1003.7 | 1004.1 | 1004.4 | 1004.7 | 1005.1 | 1005.4 |
| 29.7 | 1005.8 | 1006.1 | 1006.4 | 1006.8 | 1007.1 | 1007.5 | 1007.8 | 1008.1 | 1008.5 | 1008.8 |
| 29.8 | 1009.1 | 1009.5 | 1009.8 | 1010.2 | 1010.5 | 1010.8 | 1011.2 | 1011.5 | 1011.9 | 1012.2 |
| 29.9 | 1012.5 | 1012.9 | 1013.2 | 1013.5 | 1013.9 | 1014.2 | 1014.6 | 1014.9 | 1015.2 | 1015.6 |
| 30.0 | 1015.9 | 1016.3 | 1016.6 | 1016.9 | 1017.3 | 1017.6 | 1018.0 | 1018.3 | 1018.6 | 1019.0 |
| 30.1 | 1019.3 | 1019.6 | 1020.0 | 1020.3 | 1020.7 | 1021.0 | 1021.3 | 1021.7 | 1022.0 | 1022.4 |
| 30.2 | 1022.7 | 1023.0 | 1023.4 | 1023.7 | 1024.0 | 1024.4 | 1024.7 | 1025.1 | 1025.4 | 1025.7 |
| 30.3 | 1026.1 | 1026.4 | 1026.8 | 1027.1 | 1027.4 | 1027.8 | 1028.1 | 1028.4 | 1028.8 | 1029.1 |
| 30.4 | 1029.5 | 1029.8 | 1030.1 | 1030.5 | 1030.8 | 1031.2 | 1031.5 | 1031.8 | 1032.2 | 1032.5 |
| 30.5 | 1032.9 | 1033.2 | 1033.5 | 1033.9 | 1034.2 | 1034.5 | 1034.9 | 1035.2 | 1035.6 | 1035.9 |
| 30.6 | 1036.2 | 1036.6 | 1036.9 | 1037.3 | 1037.6 | 1037.9 | 1038.3 | 1038.6 | 1038.9 | 1039.3 |
| 30.7 | 1039.6 | 1040.0 | 1040.3 | 1040.6 | 1041.0 | 1041.3 | 1041.7 | 1042.0 | 1042.3 | 1042.7 |
| 30.8 | 1043.0 | 1043.3 | 1043.7 | 1044.0 | 1044.4 | 1044.7 | 1045.0 | 1045.4 | 1045.7 | 1046.1 |
| 30.9 | 1046.4 | 1046.7 | 1047.1 | 1047.4 | 1047.8 | 1048.1 | 1048.4 | 1048.8 | 1049.1 | 1049.5 |
| 31.0 | 1049.8 | 1050.1 | 1050.5 | 1050.8 | 1051.1 | 1051.5 | 1051.8 | 1052.2 | 1052.5 | 1052.8 |
| 31.1 | 1053.2 | 1053.5 | 1053.8 | 1054.2 | 1054.5 | 1054.9 | 1055.2 | 1055.5 | 1055.9 | 1056.2 |
| 31.2 | 1056.6 | 1056.9 | 1057.2 | 1057.6 | 1057.9 | 1058.2 | 1058.6 | 1058.9 | 1059.3 | 1059.6 |
| 31.3 | 1059.9 | 1060.3 | 1060.6 | 1061.0 | 1061.3 | 1061.6 | 1062.0 | 1062.3 | 1062.7 | 1063.0 |
| 31.4 | 1063.3 | 1063.7 | 1064.0 | 1064.3 | 1064.7 | 1065.0 | 1065.4 | 1065.7 | 1066.0 | 1066.4 |
| 31.5 | 1066.7 | 1067.1 | 1067.4 | 1067.7 | 1068.1 | 1068.4 | 1068.7 | 1069.1 | 1069.4 | 1069.8 |
| 31.6 | 1070.1 | 1070.4 | 1070.8 | 1071.1 | 1071.5 | 1071.8 | 1072.1 | 1072.5 | 1072.8 | 1073.1 |
| 31.7 | 1073.5 | 1073.8 | 1074.2 | 1074.5 | 1074.8 | 1075.2 | 1075.5 | 1075.9 | 1076.2 | 1076.5 |
| 31.8 | 1076.9 | 1077.2 | 1077.6 | 1077.9 | 1078.2 | 1078.6 | 1078.9 | 1079.2 | 1079.6 | 1079.9 |
| 31.9 | 1080.3 | 1080.6 | 1080.9 | 1081.3 | 1081.6 | 1082.0 | 1082.3 | 1082.6 | 1083.0 | 1083.3 |

Table 12.

## BAROMETRIC MILLIMETERS (MERCURY) INTO MILLIBARS.

1 mm. = 1.33322387 mb.

| Milli-meters. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. |
| 0 | 0 | 1.3 | 2.7 | 4.0 | 5.3 | 6.7 | 8.0 | 9.3 | 10.7 | 12.0 |
| 10 | 13.3 | 14.7 | 16.0 | 17.3 | 18.7 | 20.0 | 21.3 | 22.7 | 24.0 | 25.3 |
| 20 | 26.7 | 28.0 | 29.3 | 30.7 | 32.0 | 33.3 | 34.7 | 36.0 | 37.3 | 38.7 |
| 30 | 40.0 | 41.3 | 42.7 | 44.0 | 45.3 | 46.7 | 48.0 | 49.3 | 50.7 | 52.0 |
| 40 | 53.3 | 54.7 | 56.0 | 57.3 | 58.7 | 60.0 | 61.3 | 62.7 | 64.0 | 65.3 |
| 50 | 66.7 | 68.0 | 69.3 | 70.7 | 72.0 | 73.3 | 74.7 | 76.0 | 77.3 | 78.7 |
| 60 | 80.0 | 81.3 | 82.7 | 84.0 | 85.3 | 86.7 | 88.0 | 89.3 | 90.7 | 92.0 |
| 70 | 93.3 | 94.7 | 96.0 | 97.3 | 98.7 | 100.0 | 101.3 | 102.7 | 104.0 | 105.3 |
| 80 | 106.7 | 108.0 | 109.3 | 110.7 | 112.0 | 113.3 | 114.7 | 116.0 | 117.3 | 118.7 |
| 90 | 120.0 | 121.3 | 122.7 | 124.0 | 125.3 | 126.7 | 128.0 | 129.3 | 130.7 | 132.0 |
| 100 | 133.3 | 134.7 | 136.0 | 137.3 | 138.7 | 140.0 | 141.3 | 142.7 | 144.0 | 145.3 |
| 110 | 146.7 | 148.0 | 149.3 | 150.7 | 152.0 | 153.3 | 154.7 | 156.0 | 157.3 | 158.7 |
| 120 | 160.0 | 161.3 | 162.7 | 164.0 | 165.3 | 166.7 | 168.0 | 169.3 | 170.7 | 172.0 |
| 130 | 173.3 | 174.7 | 176.0 | 177.3 | 178.7 | 180.0 | 181.3 | 182.7 | 184.0 | 185.3 |
| 140 | 186.7 | 188.0 | 189.3 | 190.7 | 192.0 | 193.3 | 194.7 | 196.0 | 197.3 | 198.7 |
| 150 | 200.0 | 201.3 | 202.7 | 204.0 | 205.3 | 206.6 | 208.0 | 209.3 | 210.6 | 212.0 |
| 160 | 213.3 | 214.6 | 216.0 | 217.3 | 218.6 | 220.0 | 221.3 | 222.6 | 224.0 | 225.3 |
| 170 | 226.6 | 228.0 | 229.3 | 230.6 | 232.0 | 233.3 | 234.6 | 236.0 | 237.3 | 238.6 |
| 180 | 240.0 | 241.3 | 242.6 | 244.0 | 245.3 | 246.6 | 248.0 | 249.3 | 250.6 | 252.0 |
| 190 | 253.3 | 254.6 | 256.0 | 257.3 | 258.6 | 260.0 | 261.3 | 262.6 | 264.0 | 265.3 |
| 200 | 266.6 | 268.0 | 269.3 | 270.6 | 272.0 | 273.3 | 274.6 | 276.0 | 277.3 | 278.6 |
| 210 | 280.0 | 281.3 | 282.6 | 284.0 | 285.3 | 286.6 | 288.0 | 289.3 | 290.6 | 292.0 |
| 220 | 293.3 | 294.6 | 296.0 | 297.3 | 298.6 | 300.0 | 301.3 | 302.6 | 304.0 | 305.3 |
| 230 | 306.6 | 308.0 | 309.3 | 310.6 | 312.0 | 313.3 | 314.6 | 316.0 | 317.3 | 318.6 |
| 240 | 320.0 | 321.3 | 322.6 | 324.0 | 325.3 | 326.6 | 328.0 | 329.3 | 330.6 | 332.0 |
| 250 | 333.3 | 334.6 | 336.0 | 337.3 | 338.6 | 340.0 | 341.3 | 342.6 | 344.0 | 345.3 |
| 260 | 346.6 | 348.0 | 349.3 | 350.6 | 352.0 | 353.3 | 354.6 | 356.0 | 357.3 | 358.6 |
| 270 | 360.0 | 361.3 | 362.6 | 364.0 | 365.3 | 366.6 | 368.0 | 369.3 | 370.6 | 372.0 |
| 280 | 373.3 | 374.6 | 376.0 | 377.3 | 378.6 | 380.0 | 381.3 | 382.6 | 384.0 | 385.3 |
| 290 | 386.6 | 388.0 | 389.3 | 390.6 | 392.0 | 393.3 | 394.6 | 396.0 | 397.3 | 398.6 |
| 300 | 400.0 | 401.3 | 402.6 | 404.0 | 405.3 | 406.6 | 408.0 | 409.3 | 410.6 | 412.0 |
| 310 | 413.3 | 414.6 | 416.0 | 417.3 | 418.6 | 420.0 | 421.3 | 422.6 | 424.0 | 425.3 |
| 320 | 426.6 | 428.0 | 429.3 | 430.6 | 432.0 | 433.3 | 434.6 | 436.0 | 437.3 | 438.6 |
| 330 | 440.0 | 441.3 | 442.6 | 444.0 | 445.3 | 446.6 | 448.0 | 449.3 | 450.6 | 452.0 |
| 340 | 453.3 | 454.6 | 456.0 | 457.3 | 458.6 | 460.0 | 461.3 | 462.6 | 464.0 | 465.3 |
| 350 | 466.6 | 468.0 | 469.3 | 470.6 | 472.0 | 473.3 | 474.6 | 476.0 | 477.3 | 478.6 |
| 360 | 480.0 | 481.3 | 482.6 | 484.0 | 485.3 | 486.6 | 488.0 | 489.3 | 490.6 | 492.0 |
| 370 | 493.3 | 494.6 | 496.0 | 497.3 | 498.6 | 500.0 | 501.3 | 502.6 | 504.0 | 505.3 |
| 380 | 506.6 | 508.0 | 509.3 | 510.6 | 512.0 | 513.3 | 514.6 | 516.0 | 517.3 | 518.6 |
| 390 | 520.0 | 521.3 | 522.6 | 524.0 | 525.3 | 526.6 | 528.0 | 529.3 | 530.6 | 532.0 |
| 400 | 533.3 | 534.6 | 536.0 | 537.3 | 538.6 | 540.0 | 541.3 | 542.6 | 544.0 | 545.3 |
| 410 | 546.6 | 548.0 | 549.3 | 550.6 | 552.0 | 553.3 | 554.6 | 556.0 | 557.3 | 558.6 |
| 420 | 560.0 | 561.3 | 562.6 | 564.0 | 565.3 | 566.6 | 568.0 | 569.3 | 570.6 | 572.0 |
| 430 | 573.3 | 574.6 | 576.0 | 577.3 | 578.6 | 580.0 | 581.3 | 582.6 | 584.0 | 585.3 |
| 440 | 586.6 | 588.0 | 589.3 | 590.6 | 592.0 | 593.3 | 594.6 | 596.0 | 597.3 | 598.6 |

## BAROMETRIC MILLIMETERS (MERCURY) INTO MILLIBARS.

1 mm. = 1.33322387 mb.

| Milli-meters. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. | mb. |
| 450 | 600.0 | 601.3 | 602.6 | 604.0 | 605.3 | 606.6 | 608.0 | 609.3 | 610.6 | 611.9 |
| 460 | 613.3 | 614.6 | 615.9 | 617.3 | 618.6 | 619.9 | 621.3 | 622.6 | 623.9 | 625.3 |
| 470 | 626.6 | 627.9 | 629.3 | 630.6 | 631.9 | 633.3 | 634.6 | 635.9 | 637.3 | 638.6 |
| 480 | 639.9 | 641.3 | 642.6 | 643.9 | 645.3 | 646.6 | 647.9 | 649.3 | 650.6 | 651.9 |
| 490 | 653.3 | 654.6 | 655.9 | 657.3 | 658.6 | 659.9 | 661.3 | 662.6 | 663.9 | 665.3 |
| 500 | 666.6 | 667.9 | 669.3 | 670.6 | 671.9 | 673.3 | 674.6 | 675.9 | 677.3 | 678.6 |
| 510 | 679.9 | 681.3 | 682.6 | 683.9 | 685.3 | 686.6 | 687.9 | 689.3 | 690.6 | 691.9 |
| 520 | 693.3 | 694.6 | 695.9 | 697.3 | 698.6 | 699.9 | 701.3 | 702.6 | 703.9 | 705.3 |
| 530 | 706.6 | 707.9 | 709.3 | 710.6 | 711.9 | 713.3 | 714.6 | 715.9 | 717.3 | 718.6 |
| 540 | 719.9 | 721.3 | 722.6 | 723.9 | 725.3 | 726.6 | 727.9 | 729.3 | 730.6 | 731.9 |
| 550 | 733.3 | 734.6 | 735.9 | 737.3 | 738.6 | 739.9 | 741.3 | 742.6 | 743.9 | 745.3 |
| 560 | 746.6 | 747.9 | 749.3 | 750.6 | 751.9 | 753.3 | 754.6 | 755.9 | 757.3 | 758.6 |
| 570 | 759.9 | 761.3 | 762.6 | 763.9 | 765.3 | 766.6 | 767.9 | 769.3 | 770.6 | 771.9 |
| 580 | 773.3 | 774.6 | 775.9 | 777.3 | 778.6 | 779.9 | 781.3 | 782.6 | 783.9 | 785.3 |
| 590 | 786.6 | 787.9 | 789.3 | 790.6 | 791.9 | 793.3 | 794.6 | 795.9 | 797.3 | 798.6 |
| 600 | 799.9 | 801.3 | 802.6 | 803.9 | 805.3 | 806.6 | 807.9 | 809.3 | 810.6 | 811.9 |
| 610 | 813.3 | 814.6 | 815.9 | 817.3 | 818.6 | 819.9 | 821.3 | 822.6 | 823.9 | 825.3 |
| 620 | 826.6 | 827.9 | 829.3 | 830.6 | 831.9 | 833.3 | 834.6 | 835.9 | 837.3 | 838.6 |
| 630 | 839.9 | 841.3 | 842.6 | 843.9 | 845.3 | 846.6 | 847.9 | 849.3 | 850.6 | 851.9 |
| 640 | 853.3 | 854.6 | 855.9 | 857.3 | 858.6 | 859.9 | 861.3 | 862.6 | 863.9 | 865.3 |
| 650 | 866.6 | 867.9 | 869.3 | 870.6 | 871.9 | 873.3 | 874.6 | 875.9 | 877.3 | 878.6 |
| 660 | 879.9 | 881.3 | 882.6 | 883.9 | 885.3 | 886.6 | 887.9 | 889.3 | 890.6 | 891.9 |
| 670 | 893.3 | 894.6 | 895.9 | 897.3 | 898.6 | 899.9 | 901.3 | 902.6 | 903.9 | 905.3 |
| 680 | 906.6 | 907.9 | 909.3 | 910.6 | 911.9 | 913.3 | 914.6 | 915.9 | 917.3 | 918.6 |
| 690 | 919.9 | 921.3 | 922.6 | 923.9 | 925.3 | 926.6 | 927.9 | 929.3 | 930.6 | 931.9 |
| 700 | 933.3 | 934.6 | 935.9 | 937.3 | 938.6 | 939.9 | 941.3 | 942.6 | 943.9 | 945.3 |
| 710 | 946.6 | 947.9 | 949.3 | 950.6 | 951.9 | 953.3 | 954.6 | 955.9 | 957.3 | 958.6 |
| 720 | 959.9 | 961.3 | 962.6 | 963.9 | 965.3 | 966.6 | 967.9 | 969.3 | 970.6 | 971.9 |
| 730 | 973.3 | 974.6 | 975.9 | 977.3 | 978.6 | 979.9 | 981.3 | 982.6 | 983.9 | 985.3 |
| 740 | 986.6 | 987.9 | 989.3 | 990.6 | 991.9 | 993.3 | 994.6 | 995.9 | 997.3 | 998.6 |
| 750 | 999.9 | 1001.3 | 1002.6 | 1003.9 | 1005.3 | 1006.6 | 1007.9 | 1009.3 | 1010.6 | 1011.9 |
| 760 | 1013.3 | 1014.6 | 1015.9 | 1017.2 | 1018.6 | 1019.9 | 1021.2 | 1022.6 | 1023.9 | 1025.2 |
| 770 | 1026.6 | 1027.9 | 1029.2 | 1030.6 | 1031.9 | 1033.2 | 1034.6 | 1035.9 | 1037.2 | 1038.6 |
| 780 | 1039.9 | 1041.2 | 1042.6 | 1043.9 | 1045.2 | 1046.6 | 1047.9 | 1049.2 | 1050.6 | 1051.9 |
| 790 | 1053.2 | 1054.6 | 1055.9 | 1057.2 | 1058.6 | 1059.9 | 1061.2 | 1062.6 | 1063.9 | 1065.2 |

# FEET INTO METERS.

1 foot = 0.3048006 meter.

| Feet. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| 0 | 0.000 | 0.305 | 0.610 | 0.914 | 1.219 | 1.524 | 1.829 | 2.134 | 2.438 | 2.743 |
| 10 | 3.048 | 3.353 | 3.658 | 3.962 | 4.267 | 4.572 | 4.877 | 5.182 | 5.486 | 5.791 |
| 20 | 6.096 | 6.401 | 6.706 | 7.010 | 7.315 | 7.620 | 7.925 | 8.230 | 8.534 | 8.839 |
| 30 | 9.144 | 9.449 | 9.754 | 10.058 | 10.363 | 10.668 | 10.973 | 11.278 | 11.582 | 11.887 |
| 40 | 12.192 | 12.497 | 12.802 | 13.106 | 13.411 | 13.716 | 14.021 | 14.326 | 14.630 | 14.935 |
| 50 | 15.240 | 15.545 | 15.850 | 16.154 | 16.459 | 16.764 | 17.069 | 17.374 | 17.678 | 17.983 |
| 60 | 18.288 | 18.593 | 18.898 | 19.202 | 19.507 | 19.812 | 20.117 | 20.422 | 20.726 | 21.031 |
| 70 | 21.336 | 21.641 | 21.946 | 22.250 | 22.555 | 22.860 | 23.165 | 23.470 | 23.774 | 24.079 |
| 80 | 24.384 | 24.689 | 24.994 | 25.298 | 25.603 | 25.908 | 26.213 | 26.518 | 26.822 | 27.127 |
| 90 | 27.432 | 27.737 | 28.042 | 28.346 | 28.651 | 28.956 | 29.261 | 29.566 | 29.870 | 30.175 |

| Feet. | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 30.48 | 33.53 | 36.58 | 39.62 | 42.67 | 45.72 | 48.77 | 51.82 | 54.86 | 57.91 |
| 200 | 60.96 | 64.01 | 67.06 | 70.10 | 73.15 | 76.20 | 79.25 | 82.30 | 85.34 | 88.39 |
| 300 | 91.44 | 94.49 | 97.54 | 100.58 | 103.63 | 106.68 | 109.73 | 112.78 | 115.82 | 118.87 |
| 400 | 121.92 | 124.97 | 128.02 | 131.06 | 134.11 | 137.16 | 140.21 | 143.26 | 146.30 | 149.35 |
| 500 | 152.40 | 155.45 | 158.50 | 161.54 | 164.59 | 167.64 | 170.69 | 173.74 | 176.78 | 179.83 |
| 600 | 182.88 | 185.93 | 188.98 | 192.02 | 195.07 | 198.12 | 201.17 | 204.22 | 207.26 | 210.31 |
| 700 | 213.36 | 216.41 | 219.46 | 222.50 | 225.55 | 228.60 | 231.65 | 234.70 | 237.74 | 240.79 |
| 800 | 243.84 | 246.89 | 249.94 | 252.98 | 256.03 | 259.08 | 262.13 | 265.18 | 268.22 | 271.27 |
| 900 | 274.32 | 277.37 | 280.42 | 283.46 | 286.51 | 289.56 | 292.61 | 295.66 | 298.70 | 301.75 |
| 1000 | 304.80 | 307.85 | 310.90 | 313.94 | 316.99 | 320.04 | 323.09 | 326.14 | 329.18 | 332.23 |
| 1100 | 335.28 | 338.33 | 341.38 | 344.42 | 347.47 | 350.52 | 353.57 | 356.62 | 359.67 | 362.71 |
| 1200 | 365.76 | 368.81 | 371.86 | 374.90 | 377.95 | 381.00 | 384.05 | 387.10 | 390.14 | 393.19 |
| 1300 | 396.24 | 399.29 | 402.34 | 405.38 | 408.43 | 411.48 | 414.53 | 417.58 | 420.62 | 423.67 |
| 1400 | 426.72 | 429.77 | 432.82 | 435.86 | 438.91 | 441.96 | 445.01 | 448.06 | 451.10 | 454.15 |
| 1500 | 457.20 | 460.25 | 463.30 | 466.34 | 469.39 | 472.44 | 475.49 | 478.54 | 481.58 | 484.63 |
| 1600 | 487.68 | 490.73 | 493.78 | 496.82 | 499.87 | 502.92 | 505.97 | 509.02 | 512.07 | 515.11 |
| 1700 | 518.16 | 521.21 | 524.26 | 527.31 | 530.35 | 533.40 | 536.45 | 539.50 | 542.55 | 545.59 |
| 1800 | 548.64 | 551.69 | 554.74 | 557.79 | 560.83 | 563.88 | 566.93 | 569.98 | 573.03 | 576.07 |
| 1900 | 579.12 | 582.17 | 585.22 | 588.27 | 591.31 | 594.36 | 597.41 | 600.46 | 603.51 | 606.55 |
| 2000 | 609.60 | 612.65 | 615.70 | 618.75 | 621.79 | 624.84 | 627.89 | 630.94 | 633.99 | 637.03 |
| 2100 | 640.08 | 643.13 | 646.18 | 649.23 | 652.27 | 655.32 | 658.37 | 661.42 | 664.47 | 667.51 |
| 2200 | 670.56 | 673.61 | 676.66 | 679.71 | 682.75 | 685.80 | 688.85 | 691.90 | 694.95 | 697.99 |
| 2300 | 701.04 | 704.09 | 707.14 | 710.19 | 713.23 | 716.28 | 719.33 | 722.38 | 725.43 | 728.47 |
| 2400 | 731.52 | 734.57 | 737.62 | 740.67 | 743.71 | 746.76 | 749.81 | 752.86 | 755.91 | 758.95 |
| 2500 | 762.00 | 765.05 | 768.10 | 771.15 | 774.19 | 777.24 | 780.29 | 783.34 | 786.39 | 789.43 |
| 2600 | 792.48 | 795.53 | 798.58 | 801.63 | 804.67 | 807.72 | 810.77 | 813.82 | 816.87 | 819.91 |
| 2700 | 822.96 | 826.01 | 829.06 | 832.11 | 835.15 | 838.20 | 841.25 | 844.30 | 847.35 | 850.39 |
| 2800 | 853.44 | 856.49 | 859.54 | 862.59 | 865.63 | 868.68 | 871.73 | 874.78 | 877.83 | 880.87 |
| 2900 | 883.92 | 886.97 | 890.02 | 893.07 | 896.11 | 899.16 | 902.21 | 905.26 | 908.31 | 911.35 |
| 3000 | 914.40 | 917.45 | 920.50 | 923.55 | 926.59 | 929.64 | 932.69 | 935.74 | 938.79 | 941.83 |
| 3100 | 944.88 | 947.93 | 950.98 | 954.03 | 957.07 | 960.12 | 963.17 | 966.22 | 969.27 | 972.31 |
| 3200 | 975.36 | 978.41 | 981.46 | 984.51 | 987.55 | 990.60 | 993.65 | 996.70 | 999.75 | 1002.79 |
| 3300 | 1005.84 | 1008.89 | 1011.94 | 1014.99 | 1018.03 | 1021.08 | 1024.13 | 1027.18 | 1030.23 | 1033.27 |
| 3400 | 1036.32 | 1039.37 | 1042.42 | 1045.47 | 1048.51 | 1051.56 | 1054.61 | 1057.66 | 1060.71 | 1063.75 |
| 3500 | 1066.80 | 1069.85 | 1072.90 | 1075.95 | 1078.99 | 1082.04 | 1085.09 | 1088.14 | 1091.19 | 1094.23 |
| 3600 | 1097.28 | 1100.33 | 1103.38 | 1106.43 | 1109.47 | 1112.52 | 1115.57 | 1118.62 | 1121.67 | 1124.71 |
| 3700 | 1127.76 | 1130.81 | 1133.86 | 1136.91 | 1139.95 | 1143.00 | 1146.05 | 1149.10 | 1152.15 | 1155.19 |
| 3800 | 1158.24 | 1161.29 | 1164.34 | 1167.39 | 1170.43 | 1173.48 | 1176.53 | 1179.58 | 1182.63 | 1185.67 |
| 3900 | 1188.72 | 1191.77 | 1194.82 | 1197.87 | 1200.91 | 1203.96 | 1207.01 | 1210.06 | 1213.11 | 1216.15 |
| 4000 | 1219.20 | 1222.25 | 1225.30 | 1228.35 | 1231.39 | 1234.44 | 1237.49 | 1240.54 | 1243.59 | 1246.63 |

## FEET INTO METERS.

1 foot = 0.3048006 meter.

| Feet. | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|
| | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| 4000 | 1219.2 | 1222.3 | 1225.3 | 1228.3 | 1231.4 | 1234.4 | 1237.5 | 1240.5 | 1243.6 | 1246.6 |
| 4100 | 1249.7 | 1252.7 | 1255.8 | 1258.8 | 1261.9 | 1264.9 | 1268.0 | 1271.0 | 1274.1 | 1277.1 |
| 4200 | 1280.2 | 1283.2 | 1286.3 | 1289.3 | 1292.4 | 1295.4 | 1298.5 | 1301.5 | 1304.5 | 1307.6 |
| 4300 | 1310.6 | 1313.7 | 1316.7 | 1319.8 | 1322.8 | 1325.9 | 1328.9 | 1332.0 | 1335.0 | 1338.1 |
| 4400 | 1341.1 | 1344.2 | 1347.2 | 1350.3 | 1353.3 | 1356.4 | 1359.4 | 1362.5 | 1365.5 | 1368.6 |
| 4500 | 1371.6 | 1374.7 | 1377.7 | 1380.7 | 1383.8 | 1386.8 | 1389.9 | 1392.9 | 1396.0 | 1399.0 |
| 4600 | 1402.1 | 1405.1 | 1408.2 | 1411.2 | 1414.3 | 1417.3 | 1420.4 | 1423.4 | 1426.5 | 1429.5 |
| 4700 | 1432.6 | 1435.6 | 1438.7 | 1441.7 | 1444.8 | 1447.8 | 1450.9 | 1453.9 | 1456.9 | 1460.0 |
| 4800 | 1463.0 | 1466.1 | 1469.1 | 1472.2 | 1475.2 | 1478.3 | 1481.3 | 1484.4 | 1487.4 | 1490.5 |
| 4900 | 1493.5 | 1496.6 | 1499.6 | 1502.7 | 1505.7 | 1508.8 | 1511.8 | 1514.9 | 1517.9 | 1521.0 |
| 5000 | 1524.0 | 1527.1 | 1530.1 | 1533.1 | 1536.2 | 1539.2 | 1542.3 | 1545.3 | 1548.4 | 1551.4 |
| 5100 | 1554.5 | 1557.5 | 1560.6 | 1563.6 | 1566.7 | 1569.7 | 1572.8 | 1575.8 | 1578.9 | 1581.9 |
| 5200 | 1585.0 | 1588.0 | 1591.1 | 1594.1 | 1597.2 | 1600.2 | 1603.3 | 1606.3 | 1609.3 | 1612.4 |
| 5300 | 1615.4 | 1618.5 | 1621.5 | 1624.6 | 1627.6 | 1630.7 | 1633.7 | 1636.8 | 1639.8 | 1642.9 |
| 5400 | 1645.9 | 1649.0 | 1652.0 | 1655.1 | 1658.1 | 1661.2 | 1664.2 | 1667.3 | 1670.3 | 1673.4 |
| 5500 | 1676.4 | 1679.5 | 1682.5 | 1685.5 | 1688.6 | 1691.6 | 1694.7 | 1697.7 | 1700.8 | 1703.8 |
| 5600 | 1706.9 | 1709.9 | 1713.0 | 1716.0 | 1719.1 | 1722.1 | 1725.2 | 1728.2 | 1731.3 | 1734.3 |
| 5700 | 1737.4 | 1740.4 | 1743.5 | 1746.5 | 1749.6 | 1752.6 | 1755.7 | 1758.7 | 1761.7 | 1764.8 |
| 5800 | 1767.8 | 1770.9 | 1773.9 | 1777.0 | 1780.0 | 1783.1 | 1786.1 | 1789.2 | 1792.2 | 1795.3 |
| 5900 | 1798.3 | 1801.4 | 1804.4 | 1807.5 | 1810.5 | 1813.6 | 1816.6 | 1819.7 | 1822.7 | 1825.8 |
| 6000 | 1828.8 | 1831.9 | 1834.9 | 1837.9 | 1841.0 | 1844.0 | 1847.1 | 1850.1 | 1853.2 | 1856.2 |
| 6100 | 1859.3 | 1862.3 | 1865.4 | 1868.4 | 1871.5 | 1874.5 | 1877.6 | 1880.6 | 1883.7 | 1886.7 |
| 6200 | 1889.8 | 1892.8 | 1895.9 | 1898.9 | 1902.0 | 1905.0 | 1908.1 | 1911.1 | 1914.1 | 1917.2 |
| 6300 | 1920.2 | 1923.3 | 1926.3 | 1929.4 | 1932.4 | 1935.5 | 1938.5 | 1941.6 | 1944.6 | 1947.7 |
| 6400 | 1950.7 | 1953.8 | 1956.8 | 1959.9 | 1962.9 | 1966.0 | 1969.0 | 1972.1 | 1975.1 | 1978.2 |
| 6500 | 1981.2 | 1984.3 | 1987.3 | 1990.3 | 1993.4 | 1996.4 | 1999.5 | 2002.5 | 2005.6 | 2008.6 |
| 6600 | 2011.7 | 2014.7 | 2017.8 | 2020.8 | 2023.9 | 2026.9 | 2030.0 | 2033.0 | 2036.1 | 2039.1 |
| 6700 | 2042.2 | 2045.2 | 2048.3 | 2051.3 | 2054.4 | 2057.4 | 2060.5 | 2063.5 | 2066.5 | 2069.6 |
| 6800 | 2072.6 | 2075.7 | 2078.7 | 2081.8 | 2084.8 | 2087.9 | 2090.9 | 2094.0 | 2097.0 | 2100.1 |
| 6900 | 2103.1 | 2106.2 | 2109.2 | 2112.3 | 2115.3 | 2118.4 | 2121.4 | 2124.5 | 2127.5 | 2130.6 |
| 7000 | 2133.6 | 2136.7 | 2139.7 | 2142.7 | 2145.8 | 2148.8 | 2151.9 | 2154.9 | 2158.0 | 2161.0 |
| 7100 | 2164.1 | 2167.1 | 2170.2 | 2173.2 | 2176.3 | 2179.3 | 2182.4 | 2185.4 | 2188.5 | 2191.5 |
| 7200 | 2194.6 | 2197.6 | 2200.7 | 2203.7 | 2206.8 | 2209.8 | 2212.9 | 2215.9 | 2218.9 | 2222.0 |
| 7300 | 2225.0 | 2228.1 | 2231.1 | 2234.2 | 2237.2 | 2240.3 | 2243.3 | 2246.4 | 2249.4 | 2252.5 |
| 7400 | 2255.5 | 2258.6 | 2261.6 | 2264.7 | 2267.7 | 2270.8 | 2273.8 | 2276.9 | 2279.9 | 2283.0 |
| 7500 | 2286.0 | 2289.1 | 2292.1 | 2295.1 | 2298.2 | 2301.2 | 2304.3 | 2307.3 | 2310.4 | 2313.4 |
| 7600 | 2316.5 | 2319.5 | 2322.6 | 2325.6 | 2328.7 | 2331.7 | 2334.8 | 2337.8 | 2340.9 | 2343.9 |
| 7700 | 2347.0 | 2350.0 | 2353.1 | 2356.1 | 2359.2 | 2362.2 | 2365.3 | 2368.3 | 2371.3 | 2374.4 |
| 7800 | 2377.4 | 2380.5 | 2383.5 | 2386.6 | 2389.6 | 2392.7 | 2395.7 | 2398.8 | 2401.8 | 2404.9 |
| 7900 | 2407.9 | 2411.0 | 2414.0 | 2417.1 | 2420.1 | 2423.2 | 2426.2 | 2429.3 | 2432.3 | 2435.4 |
| 8000 | 2438.4 | 2441.5 | 2444.5 | 2447.5 | 2450.6 | 2453.6 | 2456.7 | 2459.7 | 2462.8 | 2465.8 |
| 8100 | 2468.9 | 2471.9 | 2475.0 | 2478.0 | 2481.1 | 2484.1 | 2487.2 | 2490.2 | 2493.3 | 2496.3 |
| 8200 | 2499.4 | 2502.4 | 2505.5 | 2508.5 | 2511.6 | 2514.6 | 2517.7 | 2520.7 | 2523.7 | 2526.8 |
| 8300 | 2529.8 | 2532.9 | 2535.9 | 2539.0 | 2542.0 | 2545.1 | 2548.1 | 2551.2 | 2554.2 | 2557.3 |
| 8400 | 2560.3 | 2563.4 | 2566.4 | 2569.5 | 2572.5 | 2575.6 | 2578.6 | 2581.7 | 2584.7 | 2587.8 |
| 8500 | 2590.8 | 2593.9 | 2596.9 | 2599.9 | 2603.0 | 2606.0 | 2609.1 | 2612.1 | 2615.2 | 2618.2 |
| 8600 | 2621.3 | 2624.3 | 2627.4 | 2630.4 | 2633.5 | 2636.5 | 2639.6 | 2642.6 | 2645.7 | 2648.7 |
| 8700 | 2651.8 | 2654.8 | 2657.9 | 2660.9 | 2664.0 | 2667.0 | 2670.1 | 2673.1 | 2676.1 | 2679.2 |
| 8800 | 2682.2 | 2685.3 | 2688.3 | 2691.4 | 2694.4 | 2697.5 | 2700.5 | 2703.6 | 2706.6 | 2709.7 |
| 8900 | 2712.7 | 2715.8 | 2718.8 | 2721.9 | 2724.9 | 2728.0 | 2731.0 | 2734.1 | 2737.1 | 2740.2 |
| 9000 | 2743.2 | 2746.3 | 2749.3 | 2752.3 | 2755.4 | 2758.4 | 2761.5 | 2764.5 | 2767.6 | 2770.6 |

## METERS INTO FEET.

1 meter = 39.3700 inches = 3.280833 feet.

| Meters. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 0 | 0.00 | 3.28 | 6.56 | 9.84 | 13.12 | 16.40 | 19.68 | 22.97 | 26.25 | 29.53 |
| 10 | 32.81 | 36.09 | 39.37 | 42.65 | 45.93 | 49.21 | 52.49 | 55.77 | 59.05 | 62.34 |
| 20 | 65.62 | 68.90 | 72.18 | 75.46 | 78.74 | 82.02 | 85.30 | 88.58 | 91.86 | 95.14 |
| 30 | 98.42 | 101.71 | 104.99 | 108.27 | 111.55 | 114.83 | 118.11 | 121.39 | 124.67 | 127.95 |
| 40 | 131.23 | 134.51 | 137.79 | 141.08 | 144.36 | 147.64 | 150.92 | 154.20 | 157.48 | 160.76 |
| 50 | 164.04 | 167.32 | 170.60 | 173.88 | 177.16 | 180.45 | 183.73 | 187.01 | 190.29 | 193.57 |
| 60 | 196.85 | 200.13 | 203.41 | 206.69 | 209.97 | 213.25 | 216.53 | 219.82 | 223.10 | 226.38 |
| 70 | 229.66 | 232.94 | 236.22 | 239.50 | 242.78 | 246.06 | 249.34 | 252.62 | 255.90 | 259.19 |
| 80 | 262.47 | 265.75 | 269.03 | 272.31 | 275.59 | 278.87 | 282.15 | 285.43 | 288.71 | 291.99 |
| 90 | 295.27 | 298.56 | 301.84 | 305.12 | 308.40 | 311.68 | 314.96 | 318.24 | 321.52 | 324.80 |
| 100 | 328.08 | 331.36 | 334.64 | 337.93 | 341.21 | 344.49 | 347.77 | 351.05 | 354.33 | 357.61 |
| 110 | 360.89 | 364.17 | 367.45 | 370.73 | 374.01 | 377.30 | 380.58 | 383.86 | 387.14 | 390.42 |
| 120 | 393.70 | 396.98 | 400.26 | 403.54 | 406.82 | 410.10 | 413.38 | 416.67 | 419.95 | 423.23 |
| 130 | 426.51 | 429.79 | 433.07 | 436.35 | 439.63 | 442.91 | 446.19 | 449.47 | 452.75 | 456.04 |
| 140 | 459.32 | 462.60 | 465.88 | 469.16 | 472.44 | 475.72 | 479.00 | 482.28 | 485.56 | 488.84 |
| 150 | 492.12 | 495.41 | 498.69 | 501.97 | 505.25 | 508.53 | 511.81 | 515.09 | 518.37 | 521.65 |
| 160 | 524.93 | 528.21 | 531.49 | 534.78 | 538.06 | 541.34 | 544.62 | 547.90 | 551.18 | 554.46 |
| 170 | 557.74 | 561.02 | 564.30 | 567.58 | 570.86 | 574.15 | 577.43 | 580.71 | 583.99 | 587.27 |
| 180 | 590.55 | 593.83 | 597.11 | 600.39 | 603.67 | 606.95 | 610.23 | 613.52 | 616.80 | 620.08 |
| 190 | 623.36 | 626.64 | 629.92 | 633.20 | 636.48 | 639.76 | 643.04 | 646.32 | 649.60 | 652.89 |
| 200 | 656.17 | 659.45 | 662.73 | 666.01 | 669.29 | 672.57 | 675.85 | 679.13 | 682.41 | 685.69 |
| 210 | 688.97 | 692.26 | 695.54 | 698.82 | 702.10 | 705.38 | 708.66 | 711.94 | 715.22 | 718.50 |
| 220 | 721.78 | 725.06 | 728.34 | 731.63 | 734.91 | 738.19 | 741.47 | 744.75 | 748.03 | 751.31 |
| 230 | 754.59 | 757.87 | 761.15 | 764.43 | 767.71 | 771.00 | 774.28 | 777.56 | 780.84 | 784.12 |
| 240 | 787.40 | 790.68 | 793.96 | 797.24 | 800.52 | 803.80 | 807.08 | 810.37 | 813.65 | 816.93 |
| 250 | 820.21 | 823.49 | 826.77 | 830.05 | 833.33 | 836.61 | 839.89 | 843.17 | 846.45 | 849.74 |
| 260 | 853.02 | 856.30 | 859.58 | 862.86 | 866.14 | 869.42 | 872.70 | 875.98 | 879.26 | 882.54 |
| 270 | 885.82 | 889.11 | 892.39 | 895.67 | 898.95 | 902.23 | 905.51 | 908.79 | 912.07 | 915.35 |
| 280 | 918.63 | 921.91 | 925.19 | 928.48 | 931.76 | 935.04 | 938.32 | 941.60 | 944.88 | 948.16 |
| 290 | 951.44 | 954.72 | 958.00 | 961.28 | 964.56 | 967.85 | 971.13 | 974.41 | 977.69 | 980.97 |
| 300 | 984.25 | 987.53 | 990.81 | 994.09 | 997.37 | 1000.65 | 1003.93 | 1007.22 | 1010.50 | 1013.78 |
| 310 | 1017.06 | 1020.34 | 1023.62 | 1026.90 | 1030.18 | 1033.46 | 1036.74 | 1040.02 | 1043.30 | 1046.59 |
| 320 | 1049.87 | 1053.15 | 1056.43 | 1059.71 | 1062.99 | 1066.27 | 1069.55 | 1072.83 | 1076.11 | 1079.39 |
| 330 | 1082.67 | 1085.96 | 1089.24 | 1092.52 | 1095.80 | 1099.08 | 1102.36 | 1105.64 | 1109.92 | 1112.20 |
| 340 | 1115.48 | 1118.76 | 1122.04 | 1125.33 | 1128.61 | 1131.89 | 1135.17 | 1138.45 | 1141.73 | 1145.01 |
| 350 | 1148.29 | 1151.57 | 1154.85 | 1158.13 | 1161.41 | 1164.70 | 1167.98 | 1171.26 | 1174.54 | 1177.82 |
| 360 | 1181.10 | 1184.38 | 1187.66 | 1190.94 | 1194.22 | 1197.50 | 1200.78 | 1204.07 | 1207.35 | 1210.63 |
| 370 | 1213.91 | 1217.19 | 1220.47 | 1223.75 | 1227.03 | 1230.31 | 1233.59 | 1236.87 | 1240.15 | 1243.44 |
| 380 | 1246.72 | 1250.00 | 1253.28 | 1256.56 | 1259.84 | 1263.12 | 1266.40 | 1269.68 | 1272.96 | 1276.24 |
| 390 | 1279.52 | 1282.81 | 1286.09 | 1289.37 | 1292.65 | 1295.93 | 1299.21 | 1302.49 | 1305.77 | 1309.05 |
| 400 | 1312.33 | 1315.61 | 1318.89 | 1322.18 | 1325.46 | 1328.74 | 1332.02 | 1335.30 | 1338.58 | 1341.86 |
| 410 | 1345.14 | 1348.42 | 1351.70 | 1354.98 | 1358.26 | 1361.55 | 1364.83 | 1368.11 | 1371.39 | 1374.67 |
| 420 | 1377.95 | 1381.23 | 1384.51 | 1387.79 | 1391.07 | 1394.35 | 1397.63 | 1400.92 | 1404.20 | 1407.48 |
| 430 | 1410.76 | 1414.04 | 1417.32 | 1420.60 | 1423.88 | 1427.16 | 1430.44 | 1433.72 | 1437.00 | 1440.29 |
| 440 | 1443.57 | 1446.85 | 1450.13 | 1453.41 | 1456.69 | 1459.97 | 1463.25 | 1466.53 | 1469.81 | 1473.09 |
| 450 | 1476.37 | 1479.66 | 1482.94 | 1486.22 | 1489.50 | 1492.78 | 1496.06 | 1499.34 | 1502.62 | 1505.90 |
| 460 | 1509.18 | 1512.46 | 1515.74 | 1519.03 | 1522.31 | 1525.59 | 1528.87 | 1532.15 | 1535.43 | 1538.71 |
| 470 | 1541.99 | 1545.27 | 1548.55 | 1551.83 | 1555.11 | 1558.40 | 1561.68 | 1564.96 | 1568.24 | 1571.52 |
| 480 | 1574.80 | 1578.08 | 1581.36 | 1584.64 | 1587.92 | 1591.20 | 1594.48 | 1597.77 | 1601.05 | 1604.33 |
| 490 | 1607.61 | 1610.89 | 1614.17 | 1617.45 | 1620.73 | 1624.01 | 1627.29 | 1630.57 | 1633.85 | 1637.14 |
| 500 | 1640.42 | 1643.70 | 1646.98 | 1650.26 | 1653.54 | 1656.82 | 1660.10 | 1663.38 | 1666.66 | 1669.94 |

## METERS INTO FEET.

1 meter = 39.3700 inches = 3 280833 feet.

| Meters. | 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 500 | 1640.4 | 1673.2 | 1706.0 | 1738.8 | 1771.6 | 1804.5 | 1837.3 | 1870.1 | 1902.9 | 1935.7 |
| 600 | 1968.5 | 2001.3 | 2034.1 | 2066.9 | 2099.7 | 2132.5 | 2165.3 | 2198.2 | 2231.0 | 2263.8 |
| 700 | 2296.6 | 2329.4 | 2362.2 | 2395.0 | 2427.8 | 2460.6 | 2493.4 | 2526.2 | 2559.0 | 2591.9 |
| 800 | 2624.7 | 2657.5 | 2690.3 | 2723.1 | 2755.9 | 2788.7 | 2821.5 | 2854.3 | 2887.1 | 2919.9 |
| 900 | 2952.7 | 2985.6 | 3018.4 | 3051.2 | 3084.0 | 3116.8 | 3149.6 | 3182.4 | 3215.2 | 3248.0 |
| 1000 | 3280.8 | 3313.6 | 3346.4 | 3379.3 | 3412.1 | 3444.9 | 3477.7 | 3510.5 | 3543.3 | 3576.1 |
| 1100 | 3608.9 | 3641.7 | 3674.5 | 3707.3 | 3740.1 | 3773.0 | 3805.8 | 3838.6 | 3871.4 | 3904.2 |
| 1200 | 3937.0 | 3969.8 | 4002.6 | 4035.4 | 4068.2 | 4101.0 | 4133.8 | 4166.7 | 4199.5 | 4232.3 |
| 1300 | 4265.1 | 4297.9 | 4330.7 | 4363.5 | 4396.3 | 4429.1 | 4461.9 | 4494.7 | 4527.5 | 4560.4 |
| 1400 | 4593.2 | 4626.0 | 4658.8 | 4691.6 | 4724.4 | 4757.2 | 4790.0 | 4822.8 | 4855.6 | 4888.4 |
| 1500 | 4921.2 | 4954.1 | 4986.9 | 5019.7 | 5052.5 | 5085.3 | 5118.1 | 5150.9 | 5183.7 | 5216.5 |
| 1600 | 5249.3 | 5282.1 | 5314.9 | 5347.8 | 5380.6 | 5413.4 | 5446.2 | 5479.0 | 5511.8 | 5544.6 |
| 1700 | 5577.4 | 5610.2 | 5643.0 | 5675.8 | 5708.6 | 5741.5 | 5774.3 | 5807.1 | 5839.9 | 5872.7 |
| 1800 | 5905.5 | 5938.3 | 5971.1 | 6003.9 | 6036.7 | 6069.5 | 6102.3 | 6135.2 | 6168.0 | 6200.8 |
| 1900 | 6233.6 | 6266.4 | 6299.2 | 6332.0 | 6364.8 | 6397.6 | 6430.4 | 6463.2 | 6496.0 | 6528.9 |
| 2000 | 6561.7 | 6594.5 | 6627.3 | 6660.1 | 6692.9 | 6725.7 | 6758.5 | 6791.3 | 6824.1 | 6856.9 |
| 2100 | 6889.7 | 6922.6 | 6955.4 | 6988.2 | 7021.0 | 7053.8 | 7086.6 | 7119.4 | 7152.2 | 7185.0 |
| 2200 | 7217.8 | 7250.6 | 7283.4 | 7316.3 | 7349.1 | 7381.9 | 7414.7 | 7447.5 | 7480.3 | 7513.1 |
| 2300 | 7545.9 | 7578.7 | 7611.5 | 7644.3 | 7677.1 | 7710.0 | 7742.8 | 7775.6 | 7808.4 | 7841.2 |
| 2400 | 7874.0 | 7906.8 | 7939.6 | 7972.4 | 8005.2 | 8038.0 | 8070.8 | 8103.7 | 8136.5 | 8169.3 |
| 2500 | 8202.1 | 8234.9 | 8267.7 | 8300.5 | 8333.3 | 8366.1 | 8398.9 | 8431.7 | 8464.5 | 8497.4 |
| 2600 | 8530.2 | 8563.0 | 8595.8 | 8628.6 | 8661.4 | 8694.2 | 8727.0 | 8759.8 | 8792.6 | 8825.4 |
| 2700 | 8858.2 | 8891.1 | 8923.9 | 8956.7 | 8989.5 | 9022.3 | 9055.1 | 9087.9 | 9120.7 | 9153.5 |
| 2800 | 9186.3 | 9219.1 | 9251.9 | 9284.8 | 9317.6 | 9350.4 | 9383.2 | 9416.0 | 9448.8 | 9481.6 |
| 2900 | 9514.4 | 9547.2 | 9580.0 | 9612.8 | 9645.6 | 9678.5 | 9711.3 | 9744.1 | 9776.9 | 9809.7 |
| 3000 | 9842.5 | 9875.3 | 9908.1 | 9940.9 | 9973.7 | 10006.5 | 10039.3 | 10072.2 | 10105.0 | 10137.8 |
| 3100 | 10170.6 | 10203.4 | 10236.2 | 10269.0 | 10301.8 | 10334.6 | 10367.4 | 10400.2 | 10433.0 | 10465.9 |
| 3200 | 10498.7 | 10531.5 | 10564.3 | 10597.1 | 10629.9 | 10662.7 | 10695.5 | 10728.3 | 10761.1 | 10793.9 |
| 3300 | 10826.7 | 10859.6 | 10892.4 | 10925.2 | 10958.0 | 10990.8 | 11023.6 | 11056.4 | 11089.2 | 11122.0 |
| 3400 | 11154.8 | 11187.6 | 11220.4 | 11253.3 | 11286.1 | 11318.9 | 11351.7 | 11384.5 | 11417.3 | 11450.1 |
| 3500 | 11482.9 | 11515.7 | 11548.5 | 11581.3 | 11614.1 | 11647.0 | 11679.8 | 11712.6 | 11745.4 | 11778.2 |
| 3600 | 11811.0 | 11843.8 | 11876.6 | 11909.4 | 11942.2 | 11975.0 | 12007.8 | 12040.7 | 12073.5 | 12106.3 |
| 3700 | 12139.1 | 12171.9 | 12204.7 | 12237.5 | 12270.3 | 12303.1 | 12335.9 | 12368.7 | 12401.5 | 12434.4 |
| 3800 | 12467.2 | 12500.0 | 12532.8 | 12565.6 | 12598.4 | 12631.2 | 12664.0 | 12696.8 | 12729.6 | 12762.4 |
| 3900 | 12795.2 | 12828.1 | 12860.9 | 12893.7 | 12926.5 | 12959.3 | 12992.1 | 13024.9 | 13057.7 | 13090.5 |
| 4000 | 13123.3 | 13156.1 | 13188.9 | 13221.8 | 13254.6 | 13287.4 | 13320.2 | 13353.0 | 13385.8 | 13418.6 |
| 4100 | 13451.4 | 13484.2 | 13517.0 | 13549.8 | 13582.6 | 13615.5 | 13648.3 | 13681.1 | 13713.9 | 13746.7 |
| 4200 | 13779.5 | 13812.3 | 13845.1 | 13877.9 | 13910.7 | 13943.5 | 13976.3 | 14009.2 | 14042.0 | 14074.8 |
| 4300 | 14107.6 | 14140.4 | 14173.2 | 14206.0 | 14238.8 | 14271.6 | 14304.4 | 14337.2 | 14370.0 | 14402.9 |
| 4400 | 14435.7 | 14468.5 | 14501.3 | 14534.1 | 14566.9 | 14599.7 | 14632.5 | 14665.3 | 14698.1 | 14730.9 |
| 4500 | 14763.7 | 14796.6 | 14829.4 | 14862.2 | 14895.0 | 14927.8 | 14960.6 | 14993.4 | 15026.2 | 15059.0 |
| 4600 | 15091.8 | 15124.6 | 15157.4 | 15190.3 | 15223.1 | 15255.9 | 15288.7 | 15321.5 | 15354.3 | 15387.1 |
| 4700 | 15419.9 | 15452.7 | 15485.5 | 15518.3 | 15551.1 | 15584.0 | 15616.8 | 15649.6 | 15682.4 | 15715.2 |
| 4800 | 15748.0 | 15780.8 | 15813.6 | 15846.4 | 15879.2 | 15912.0 | 15944.8 | 15977.7 | 16010.5 | 16043.3 |
| 4900 | 16076.1 | 16108.9 | 16141.7 | 16174.5 | 16207.3 | 16240.1 | 16272.9 | 16305.7 | 16338.5 | 16371.4 |
| 5000 | 16404.2 | 16437.0 | 16469.8 | 16502.6 | 16535.4 | 16568.2 | 16601.0 | 16633.8 | 16666.6 | 16699.4 |

| Tenths of a meter. | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|
| Feet. | 0.328 | 0.656 | 0.984 | 1.312 | 1.640 | 1.968 | 2.297 | 2.625 | 2.953 |

## MILES INTO KILOMETERS.

1 mile = 1.609347 kilometers.

| Miles. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | km. | km. | km. | km. | km. | km. | km. | km. | km. | km |
| **0** | 0 | 2 | 3 | 5 | 6 | 8 | 10 | 11 | 13 | 14 |
| 10 | 16 | 18 | 19 | 21 | 23 | 24 | 26 | 27 | 29 | 31 |
| 20 | 32 | 34 | 35 | 37 | 39 | 40 | 42 | 43 | 45 | 47 |
| 30 | 48 | 50 | 51 | 53 | 55 | 56 | 58 | 60 | 61 | 63 |
| 40 | 64 | 66 | 68 | 69 | 71 | 72 | 74 | 76 | 77 | 79 |
| **50** | 80 | 82 | 84 | 85 | 87 | 89 | 90 | 92 | 93 | 95 |
| 60 | 97 | 98 | 100 | 101 | 103 | 105 | 106 | 108 | 109 | 111 |
| 70 | 113 | 114 | 116 | 117 | 119 | 121 | 122 | 124 | 126 | 127 |
| 80 | 129 | 130 | 132 | 134 | 135 | 137 | 138 | 140 | 142 | 143 |
| 90 | 145 | 146 | 148 | 150 | 151 | 153 | 154 | 156 | 158 | 159 |
| **100** | 161 | 163 | 164 | 166 | 167 | 169 | 171 | 172 | 174 | 175 |
| 110 | 177 | 179 | 180 | 182 | 183 | 185 | 187 | 188 | 190 | 192 |
| 120 | 193 | 195 | 196 | 198 | 200 | 201 | 203 | 204 | 206 | 208 |
| 130 | 209 | 211 | 212 | 214 | 216 | 217 | 219 | 220 | 222 | 224 |
| 140 | 225 | 227 | 229 | 230 | 232 | 233 | 235 | 237 | 238 | 240 |
| **150** | 241 | 243 | 245 | 246 | 248 | 249 | 251 | 253 | 254 | 256 |
| 160 | 257 | 259 | 261 | 262 | 264 | 266 | 267 | 269 | 270 | 272 |
| 170 | 274 | 275 | 277 | 278 | 280 | 282 | 283 | 285 | 286 | 288 |
| 180 | 290 | 291 | 293 | 295 | 296 | 298 | 299 | 301 | 303 | 304 |
| 190 | 306 | 307 | 309 | 311 | 312 | 314 | 315 | 317 | 319 | 320 |
| **200** | 322 | 323 | 325 | 327 | 328 | 330 | 332 | 333 | 335 | 336 |
| 210 | 338 | 340 | 341 | 343 | 344 | 346 | 348 | 349 | 351 | 352 |
| 220 | 354 | 356 | 357 | 359 | 360 | 362 | 364 | 365 | 367 | 369 |
| 230 | 370 | 372 | 373 | 375 | 377 | 378 | 380 | 381 | 383 | 385 |
| 240 | 386 | 388 | 389 | 391 | 393 | 394 | 396 | 398 | 399 | 401 |
| **250** | 402 | 404 | 406 | 407 | 409 | 410 | 412 | 414 | 415 | 417 |
| 260 | 418 | 420 | 422 | 423 | 425 | 426 | 428 | 430 | 431 | 433 |
| 270 | 435 | 436 | 438 | 439 | 441 | 443 | 444 | 446 | 447 | 449 |
| 280 | 451 | 452 | 454 | 455 | 457 | 459 | 460 | 462 | 463 | 465 |
| 290 | 467 | 468 | 470 | 472 | 473 | 475 | 476 | 478 | 480 | 481 |
| **300** | 483 | 484 | 486 | 488 | 489 | 491 | 492 | 494 | 496 | 497 |
| 310 | 499 | 501 | 502 | 504 | 505 | 507 | 509 | 510 | 512 | 513 |
| 320 | 515 | 517 | 518 | 520 | 521 | 523 | 525 | 526 | 528 | 529 |
| 330 | 531 | 533 | 534 | 536 | 538 | 539 | 541 | 542 | 544 | 546 |
| 340 | 547 | 549 | 550 | 552 | 554 | 555 | 557 | 558 | 560 | 562 |
| **350** | 563 | 565 | 566 | 568 | 570 | 571 | 573 | 575 | 576 | 578 |
| 360 | 579 | 581 | 583 | 584 | 586 | 587 | 589 | 591 | 592 | 594 |
| 370 | 595 | 597 | 599 | 600 | 602 | 604 | 605 | 607 | 608 | 610 |
| 380 | 612 | 613 | 615 | 616 | 618 | 620 | 621 | 623 | 624 | 626 |
| 390 | 628 | 629 | 631 | 632 | 634 | 636 | 637 | 639 | 641 | 642 |
| **400** | 644 | 645 | 647 | 649 | 650 | 652 | 653 | 655 | 657 | 658 |
| 410 | 660 | 661 | 663 | 665 | 666 | 668 | 669 | 671 | 673 | 674 |
| 420 | 676 | 678 | 679 | 681 | 682 | 684 | 686 | 687 | 689 | 690 |
| 430 | 692 | 694 | 695 | 697 | 698 | 700 | 702 | 703 | 705 | 706 |
| 440 | 708 | 710 | 711 | 713 | 715 | 716 | 718 | 719 | 721 | 723 |
| **450** | 724 | 726 | 727 | 729 | 731 | 732 | 734 | 735 | 737 | 739 |
| 460 | 740 | 742 | 744 | 745 | 747 | 748 | 750 | 752 | 753 | 755 |
| 470 | 756 | 758 | 760 | 761 | 763 | 764 | 766 | 768 | 769 | 771 |
| 480 | 772 | 774 | 776 | 778 | 779 | 781 | 782 | 784 | 785 | 787 |
| 490 | 789 | 790 | 792 | 793 | 795 | 797 | 798 | 800 | 801 | 803 |
| **500** | 805 | 806 | 808 | 809 | 811 | 813 | 814 | 816 | 818 | 819 |
| 510 | 821 | 822 | 824 | 826 | 827 | 829 | 830 | 832 | 834 | 835 |
| 520 | 837 | 838 | 840 | 842 | 843 | 845 | 847 | 848 | 850 | 851 |
| 530 | 853 | 855 | 856 | 858 | 859 | 861 | 863 | 864 | 866 | 867 |
| 540 | 869 | 871 | 872 | 874 | 875 | 877 | 879 | 880 | 882 | 884 |
| **550** | 885 | 887 | 888 | 890 | 892 | 893 | 895 | 896 | 898 | 900 |

# MILES INTO KILOMETERS.

| Miles. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | km. | km. | km. | km. | km. | km. | km. | km. | km. | km. |
| **550** | 885 | 887 | 888 | 890 | 892 | 893 | 895 | 896 | 898 | 900 |
| 560 | 901 | 903 | 904 | 906 | 908 | 909 | 911 | 912 | 914 | 916 |
| 570 | 917 | 919 | 921 | 922 | 924 | 925 | 927 | 929 | 930 | 932 |
| 580 | 933 | 935 | 937 | 938 | 940 | 941 | 943 | 945 | 946 | 948 |
| 590 | 950 | 951 | 953 | 954 | 956 | 958 | 959 | 961 | 962 | 964 |
| **600** | 966 | 967 | 969 | 970 | 972 | 974 | 975 | 977 | 978 | 980 |
| 610 | 982 | 983 | 985 | 987 | 988 | 990 | 991 | 993 | 995 | 996 |
| 620 | 998 | 999 | 1001 | 1003 | 1004 | 1006 | 1007 | 1009 | 1011 | 1012 |
| 630 | 1014 | 1015 | 1017 | 1019 | 1020 | 1022 | 1024 | 1025 | 1027 | 1028 |
| 640 | 1030 | 1032 | 1033 | 1035 | 1036 | 1038 | 1040 | 1041 | 1043 | 1044 |
| **650** | 1046 | 1048 | 1049 | 1051 | 1053 | 1054 | 1056 | 1057 | 1059 | 1061 |
| 660 | 1062 | 1064 | 1065 | 1067 | 1069 | 1070 | 1072 | 1073 | 1075 | 1077 |
| 670 | 1078 | 1080 | 1081 | 1083 | 1085 | 1086 | 1088 | 1090 | 1091 | 1093 |
| 680 | 1094 | 1096 | 1098 | 1099 | 1101 | 1102 | 1104 | 1106 | 1107 | 1109 |
| 690 | 1110 | 1112 | 1114 | 1115 | 1117 | 1118 | 1120 | 1122 | 1123 | 1125 |
| **700** | 1127 | 1128 | 1130 | 1131 | 1133 | 1135 | 1136 | 1138 | 1139 | 1141 |
| 710 | 1143 | 1144 | 1146 | 1147 | 1149 | 1151 | 1152 | 1154 | 1156 | 1157 |
| 720 | 1159 | 1160 | 1162 | 1164 | 1165 | 1167 | 1168 | 1170 | 1172 | 1173 |
| 730 | 1175 | 1176 | 1178 | 1180 | 1181 | 1183 | 1184 | 1186 | 1188 | 1189 |
| 740 | 1191 | 1193 | 1194 | 1196 | 1197 | 1199 | 1201 | 1202 | 1204 | 1205 |
| **750** | 1207 | 1209 | 1210 | 1212 | 1213 | 1215 | 1217 | 1218 | 1220 | 1221 |
| 760 | 1223 | 1225 | 1226 | 1228 | 1230 | 1231 | 1233 | 1234 | 1236 | 1238 |
| 770 | 1239 | 1241 | 1242 | 1244 | 1246 | 1247 | 1249 | 1250 | 1252 | 1254 |
| 780 | 1255 | 1257 | 1259 | 1260 | 1262 | 1263 | 1265 | 1267 | 1268 | 1270 |
| 790 | 1271 | 1273 | 1275 | 1276 | 1278 | 1279 | 1281 | 1283 | 1284 | 1286 |
| **800** | 1287 | 1289 | 1291 | 1292 | 1294 | 1296 | 1297 | 1299 | 1300 | 1302 |
| 810 | 1304 | 1305 | 1307 | 1308 | 1310 | 1312 | 1313 | 1315 | 1316 | 1318 |
| 820 | 1320 | 1321 | 1323 | 1324 | 1326 | 1328 | 1329 | 1331 | 1333 | 1334 |
| 830 | 1336 | 1337 | 1339 | 1341 | 1342 | 1344 | 1345 | 1347 | 1349 | 1350 |
| 840 | 1352 | 1353 | 1355 | 1357 | 1358 | 1360 | 1362 | 1363 | 1365 | 1366 |
| **850** | 1368 | 1370 | 1371 | 1373 | 1374 | 1376 | 1378 | 1379 | 1381 | 1382 |
| 860 | 1384 | 1386 | 1387 | 1389 | 1390 | 1392 | 1394 | 1395 | 1397 | 1399 |
| 870 | 1400 | 1402 | 1403 | 1405 | 1407 | 1408 | 1410 | 1411 | 1413 | 1415 |
| 880 | 1416 | 1418 | 1419 | 1421 | 1423 | 1424 | 1426 | 1427 | 1429 | 1431 |
| 890 | 1432 | 1434 | 1436 | 1437 | 1439 | 1440 | 1442 | 1444 | 1445 | 1447 |
| **900** | 1448 | 1450 | 1452 | 1453 | 1455 | 1456 | 1458 | 1460 | 1461 | 1463 |
| 910 | 1464 | 1466 | 1468 | 1469 | 1471 | 1473 | 1474 | 1476 | 1477 | 1479 |
| 920 | 1481 | 1482 | 1484 | 1485 | 1487 | 1489 | 1490 | 1492 | 1493 | 1495 |
| 930 | 1497 | 1498 | 1500 | 1502 | 1503 | 1505 | 1506 | 1508 | 1510 | 1511 |
| 940 | 1513 | 1514 | 1516 | 1518 | 1519 | 1521 | 1522 | 1524 | 1526 | 1527 |
| **950** | 1529 | 1530 | 1532 | 1534 | 1535 | 1537 | 1539 | 1540 | 1542 | 1543 |
| 960 | 1545 | 1547 | 1548 | 1550 | 1551 | 1553 | 1555 | 1556 | 1558 | 1559 |
| 970 | 1561 | 1563 | 1564 | 1566 | 1567 | 1569 | 1571 | 1572 | 1574 | 1576 |
| 980 | 1577 | 1579 | 1580 | 1582 | 1584 | 1585 | 1587 | 1588 | 1590 | 1592 |
| 990 | 1593 | 1595 | 1596 | 1598 | 1600 | 1601 | 1603 | 1605 | 1606 | 1608 |
| **1000** | 1609 | 1611 | 1613 | 1614 | 1616 | 1617 | 1619 | 1621 | 1622 | 1624 |

| Miles. | km. | Miles. | km. | Miles. | km. | Miles. | km. |
|---|---|---|---|---|---|---|---|
| **1000** | 1609 | **6000** | 9656 | **11000** | 17703 | **16000** | 25750 |
| **2000** | 3219 | **7000** | 11265 | **12000** | 19312 | **17000** | 27359 |
| **3000** | 4828 | **8000** | 12875 | **13000** | 20922 | **18000** | 28968 |
| **4000** | 6437 | **9000** | 14484 | **14000** | 22531 | **19000** | 30578 |
| **5000** | 8047 | **10000** | 16093 | **15000** | 24140 | **20000** | 32187 |

## KILOMETERS INTO MILES.

1 kilometer = 0.621370 mile.

| Kilometers. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. |
| 0 | 0.0 | 0.6 | 1.2 | 1.9 | 2.5 | 3.1 | 3.7 | 4.3 | 5.0 | 5.6 |
| 10 | 6.2 | 6.8 | 7.5 | 8.1 | 8.7 | 9.3 | 9.9 | 10.6 | 11.2 | 11.8 |
| 20 | 12.4 | 13.0 | 13.7 | 14.3 | 14.9 | 15.5 | 16.2 | 16.8 | 17.4 | 18.0 |
| 30 | 18.6 | 19.3 | 19.9 | 20.5 | 21.1 | 21.7 | 22.4 | 23.0 | 23.6 | 24.2 |
| 40 | 24.9 | 25.5 | 26.1 | 26.7 | 27.3 | 28.0 | 28.6 | 29.2 | 29.8 | 30.4 |
| 50 | 31.1 | 31.7 | 32.3 | 32.9 | 33.6 | 34.2 | 34.8 | 35.4 | 36.0 | 36.7 |
| 60 | 37.3 | 37.9 | 38.5 | 39.1 | 39.8 | 40.4 | 41.0 | 41.6 | 42.3 | 42.9 |
| 70 | 43.5 | 44.1 | 44.7 | 45.4 | 46.0 | 46.6 | 47.2 | 47.8 | 48.5 | 49.1 |
| 80 | 49.7 | 50.3 | 51.0 | 51.6 | 52.2 | 52.8 | 53.4 | 54.1 | 54.7 | 55.3 |
| 90 | 55.9 | 56.5 | 57.2 | 57.8 | 58.4 | 59.0 | 59.7 | 60.3 | 60.9 | 61.5 |
| 100 | 62.1 | 62.8 | 63.4 | 64.0 | 64.6 | 65.2 | 65.9 | 66.5 | 67.1 | 67.7 |
| 110 | 68.4 | 69.0 | 69.6 | 70.2 | 70.8 | 71.5 | 72.1 | 72.7 | 73.3 | 73.9 |
| 120 | 74.6 | 75.2 | 75.8 | 76.4 | 77.0 | 77.7 | 78.3 | 78.9 | 79.5 | 80.2 |
| 130 | 80.8 | 81.4 | 82.0 | 82.6 | 83.3 | 83.9 | 84.5 | 85.1 | 85.7 | 86.4 |
| 140 | 87.0 | 87.6 | 88.2 | 88.9 | 89.5 | 90.1 | 90.7 | 91.3 | 92.0 | 92.6 |
| 150 | 93.2 | 93.8 | 94.4 | 95.1 | 95.7 | 96.3 | 96.9 | 97.6 | 98.2 | 98.8 |
| 160 | 99.4 | 100.0 | 100.7 | 101.3 | 101.9 | 102.5 | 103.1 | 103.8 | 104.4 | 105.0 |
| 170 | 105.6 | 106.3 | 106.9 | 107.5 | 108.1 | 108.7 | 109.4 | 110.0 | 110.6 | 111.2 |
| 180 | 111.8 | 112.5 | 113.1 | 113.7 | 114.3 | 115.0 | 115.6 | 116.2 | 116.8 | 117.4 |
| 190 | 118.1 | 118.7 | 119.3 | 119.9 | 120.5 | 121.2 | 121.8 | 122.4 | 123.0 | 123.7 |
| 200 | 124.3 | 124.9 | 125.5 | 126.1 | 126.8 | 127.4 | 128.0 | 128.6 | 129.2 | 129.9 |
| 210 | 130.5 | 131.1 | 131.7 | 132.4 | 133.0 | 133.6 | 134.2 | 134.8 | 135.5 | 136.1 |
| 220 | 136.7 | 137.3 | 137.9 | 138.6 | 139.2 | 139.8 | 140.4 | 141.1 | 141.7 | 142.3 |
| 230 | 142.9 | 143.5 | 144.2 | 144.8 | 145.4 | 146.0 | 146.6 | 147.3 | 147.9 | 148.5 |
| 240 | 149.1 | 149.8 | 150.4 | 151.0 | 151.6 | 152.2 | 152.9 | 153.5 | 154.1 | 154.7 |
| 250 | 155.3 | 156.0 | 156.6 | 157.2 | 157.8 | 158.4 | 159.1 | 159.7 | 160.3 | 160.9 |
| 260 | 161.6 | 162.2 | 162.8 | 163.4 | 164.0 | 164.7 | 165.3 | 165.9 | 166.5 | 167.1 |
| 270 | 167.8 | 168.4 | 169.0 | 169.6 | 170.3 | 170.9 | 171.5 | 172.1 | 172.7 | 173.4 |
| 280 | 174.0 | 174.6 | 175.2 | 175.8 | 176.5 | 177.1 | 177.7 | 178.3 | 179.0 | 179.6 |
| 290 | 180.2 | 180.8 | 181.4 | 182.1 | 182.7 | 183.3 | 183.9 | 184.5 | 185.2 | 185.8 |
| 300 | 186.4 | 187.0 | 187.7 | 188.3 | 188.9 | 189.5 | 190.1 | 190.8 | 191.4 | 192.0 |
| 310 | 192.6 | 193.2 | 193.9 | 194.5 | 195.1 | 195.7 | 196.4 | 197.0 | 197.6 | 198.2 |
| 320 | 198.8 | 199.5 | 200.1 | 200.7 | 201.3 | 201.9 | 202.6 | 203.2 | 203.8 | 204.4 |
| 330 | 205.1 | 205.7 | 206.3 | 206.9 | 207.5 | 208.2 | 208.8 | 209.4 | 210.0 | 210.6 |
| 340 | 211.3 | 211.9 | 212.5 | 213.1 | 213.8 | 214.4 | 215.0 | 215.6 | 216.2 | 216.9 |
| 350 | 217.5 | 218.1 | 218.7 | 219.3 | 220.0 | 220.6 | 221.2 | 221.8 | 222.5 | 223.1 |
| 360 | 223.7 | 224.3 | 224.9 | 225.6 | 226.2 | 226.8 | 227.4 | 228.0 | 228.7 | 229.3 |
| 370 | 229.9 | 230.5 | 231.1 | 231.8 | 232.4 | 233.0 | 233.6 | 234.3 | 234.9 | 235.5 |
| 380 | 236.1 | 236.7 | 237.4 | 238.0 | 238.6 | 239.2 | 239.8 | 240.5 | 241.1 | 241.7 |
| 390 | 242.3 | 243.0 | 243.6 | 244.2 | 244.8 | 245.4 | 246.1 | 246.7 | 247.3 | 247.9 |
| 400 | 248.5 | 249.2 | 249.8 | 250.4 | 251.0 | 251.7 | 252.3 | 252.9 | 253.5 | 254.1 |
| 410 | 254.8 | 255.4 | 256.0 | 256.6 | 257.2 | 257.9 | 258.5 | 259.1 | 259.7 | 260.4 |
| 420 | 261.0 | 261.6 | 262.2 | 262.8 | 263.5 | 264.1 | 264.7 | 265.3 | 265.9 | 266.6 |
| 430 | 267.2 | 267.8 | 268.4 | 269.1 | 269.7 | 270.3 | 270.9 | 271.5 | 272.2 | 272.8 |
| 440 | 273.4 | 274.0 | 274.6 | 275.3 | 275.9 | 276.5 | 277.1 | 277.8 | 278.4 | 279.0 |
| 450 | 279.6 | 280.2 | 280.9 | 281.5 | 282.1 | 282.7 | 283.3 | 284.0 | 284.6 | 285.2 |
| 460 | 285.8 | 286.5 | 287.1 | 287.7 | 288.3 | 288.9 | 289.6 | 290.2 | 290.8 | 291.4 |
| 470 | 292.0 | 292.7 | 293.3 | 293.9 | 294.5 | 295.2 | 295.8 | 296.4 | 297.0 | 297.6 |
| 480 | 298.3 | 298.9 | 299.5 | 300.1 | 300.7 | 301.4 | 302.0 | 302.6 | 303.2 | 303.8 |
| 490 | 304.5 | 305.1 | 305.7 | 306.3 | 307.0 | 307.6 | 308.2 | 308.8 | 309.4 | 310.1 |
| 500 | 310.7 | 311.3 | 311.9 | 312.5 | 313.2 | 313.8 | 314.4 | 315.0 | 315.7 | 316.3 |
| 510 | 316.9 | 317.5 | 318.1 | 318.8 | 319.4 | 320.0 | 320.6 | 321.2 | 321.9 | 322.5 |
| 520 | 323.1 | 323.7 | 324.4 | 325.0 | 325.6 | 326.2 | 326.8 | 327.5 | 328.1 | 328.7 |
| 530 | 329.3 | 329.9 | 330.6 | 331.2 | 331.8 | 332.4 | 333.1 | 333.7 | 334.3 | 334.9 |
| 540 | 335.5 | 336.2 | 336.8 | 337.4 | 338.0 | 338.6 | 339.3 | 339.9 | 340.5 | 341.1 |

## KILOMETERS INTO MILES.

| Kilometers. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. | Miles. |
| 550 | 341.8 | 342.4 | 343.0 | 343.6 | 344.2 | 344.9 | 345.5 | 346.1 | 346.7 | 347.3 |
| 560 | 348.0 | 348.6 | 349.2 | 349.8 | 350.5 | 351.1 | 351.7 | 352.3 | 352.9 | 353.6 |
| 570 | 354.2 | 354.8 | 355.4 | 356.0 | 356.7 | 357.3 | 357.9 | 358.5 | 359.2 | 359.8 |
| 580 | 360.4 | 361.0 | 361.6 | 362.3 | 362.9 | 363.5 | 364.1 | 364.7 | 365.4 | 366.0 |
| 590 | 366.6 | 367.2 | 367.9 | 368.5 | 369.1 | 369.7 | 370.3 | 371.0 | 371.6 | 372.2 |
| 600 | 372.8 | 373.4 | 374.1 | 374.7 | 375.3 | 375.9 | 376.6 | 377.2 | 377.8 | 378.4 |
| 610 | 379.0 | 379.7 | 380.3 | 380.9 | 381.5 | 382.1 | 382.8 | 383.4 | 384.0 | 384.6 |
| 620 | 385.2 | 385.9 | 386.5 | 387.1 | 387.7 | 388.4 | 389.0 | 389.6 | 390.2 | 390.8 |
| 630 | 391.5 | 392.1 | 392.7 | 393.3 | 393.9 | 394.6 | 395.2 | 395.8 | 396.4 | 397.1 |
| 640 | 397.7 | 398.3 | 398.9 | 399.5 | 400.2 | 400.8 | 401.4 | 402.0 | 402.6 | 403.3 |
| 650 | 403.9 | 404.5 | 405.1 | 405.8 | 406.4 | 407.0 | 407.6 | 408.2 | 408.9 | 409.5 |
| 660 | 410.1 | 410.7 | 411.3 | 412.0 | 412.6 | 413.2 | 413.8 | 414.5 | 415.1 | 415.7 |
| 670 | 416.3 | 416.9 | 417.6 | 418.2 | 418.8 | 419.4 | 420.0 | 420.7 | 421.3 | 421.9 |
| 680 | 422.5 | 423.2 | 423.8 | 424.4 | 425.0 | 425.6 | 426.3 | 426.9 | 427.5 | 428.1 |
| 690 | 428.7 | 429.4 | 430.0 | 430.6 | 431.2 | 431.9 | 432.5 | 433.1 | 433.7 | 434.3 |
| 700 | 435.0 | 435.6 | 436.2 | 436.8 | 437.4 | 438.1 | 438.7 | 439.3 | 439.9 | 440.6 |
| 710 | 441.2 | 441.8 | 442.4 | 443.0 | 443.7 | 444.3 | 444.9 | 445.5 | 446.1 | 446.8 |
| 720 | 447.4 | 448.0 | 448.6 | 449.3 | 449.9 | 450.5 | 451.1 | 451.7 | 452.4 | 453.0 |
| 730 | 453.6 | 454.2 | 454.8 | 455.5 | 456.1 | 456.7 | 457.3 | 457.9 | 458.6 | 459.2 |
| 740 | 459.8 | 460.4 | 461.1 | 461.7 | 462.3 | 462.9 | 463.5 | 464.2 | 464.8 | 465.4 |
| 750 | 466.0 | 466.6 | 467.3 | 467.9 | 468.5 | 469.1 | 469.8 | 470.4 | 471.0 | 471.6 |
| 760 | 472.2 | 472.9 | 473.5 | 474.1 | 474.7 | 475.3 | 476.0 | 476.6 | 477.2 | 477.8 |
| 770 | 478.5 | 479.1 | 479.7 | 480.3 | 480.9 | 481.6 | 482.2 | 482.8 | 483.4 | 484.0 |
| 780 | 484.7 | 485.3 | 485.9 | 486.5 | 487.2 | 487.8 | 488.4 | 489.0 | 489.6 | 490.3 |
| 790 | 490.9 | 491.5 | 492.1 | 492.7 | 493.4 | 494.0 | 494.6 | 495.2 | 495.9 | 496.5 |
| 800 | 497.1 | 497.7 | 498.3 | 499.0 | 499.6 | 500.2 | 500.8 | 501.4 | 502.1 | 502.7 |
| 810 | 503.3 | 503.9 | 504.6 | 505.2 | 505.8 | 506.4 | 507.0 | 507.7 | 508.3 | 508.9 |
| 820 | 509.5 | 510.1 | 510.8 | 511.4 | 512.0 | 512.6 | 513.3 | 513.9 | 514.5 | 515.1 |
| 830 | 515.7 | 516.4 | 517.0 | 517.6 | 518.2 | 518.8 | 519.5 | 520.1 | 520.7 | 521.3 |
| 840 | 522.0 | 522.6 | 523.2 | 523.8 | 524.4 | 525.1 | 525.7 | 526.3 | 526.9 | 527.5 |
| 850 | 528.2 | 528.8 | 529.4 | 530.0 | 530.6 | 531.3 | 531.9 | 532.5 | 533.1 | 533.8 |
| 860 | 534.4 | 535.0 | 535.6 | 536.2 | 536.9 | 537.5 | 538.1 | 538.7 | 539.3 | 540.0 |
| 870 | 540.6 | 541.2 | 541.8 | 542.5 | 543.1 | 543.7 | 544.3 | 544.9 | 545.6 | 546.2 |
| 880 | 546.8 | 547.4 | 548.0 | 548.7 | 549.3 | 549.9 | 550.5 | 551.2 | 551.8 | 552.4 |
| 890 | 553.0 | 553.6 | 554.3 | 554.9 | 555.5 | 556.1 | 556.7 | 557.4 | 558.0 | 558.6 |
| 900 | 559.2 | 559.9 | 560.5 | 561.1 | 561.7 | 562.3 | 563.0 | 563.6 | 564.2 | 564.8 |
| 910 | 565.4 | 566.1 | 566.7 | 567.3 | 567.9 | 568.6 | 569.2 | 569.8 | 570.4 | 571.0 |
| 920 | 571.7 | 572.3 | 572.9 | 573.5 | 574.1 | 574.8 | 575.4 | 576.0 | 576.6 | 577.3 |
| 930 | 577.9 | 578.5 | 579.1 | 579.7 | 580.4 | 581.0 | 581.6 | 582.2 | 582.8 | 583.5 |
| 940 | 584.1 | 584.7 | 585.3 | 586.0 | 586.6 | 587.2 | 587.8 | 588.4 | 589.1 | 589.7 |
| 950 | 590.3 | 590.9 | 591.5 | 592.2 | 592.8 | 593.4 | 594.0 | 594.7 | 595.3 | 595.9 |
| 960 | 596.5 | 597.1 | 597.8 | 598.4 | 599.0 | 599.6 | 600.2 | 600.9 | 601.5 | 602.1 |
| 970 | 602.7 | 603.4 | 604.0 | 604.6 | 605.2 | 605.8 | 606.5 | 607.1 | 607.7 | 608.3 |
| 980 | 608.9 | 609.6 | 610.2 | 610.8 | 611.4 | 612.0 | 612.7 | 613.3 | 613.9 | 614.5 |
| 990 | 615.2 | 615.8 | 616.4 | 617.0 | 617.6 | 618.3 | 618.9 | 619.5 | 620.1 | 620.7 |
| 1000 | 621.4 | 622.0 | 622.6 | 623.2 | 623.9 | 624.5 | 625.1 | 625.7 | 626.3 | 627.0 |

| km. | Miles. | km. | Miles. | km. | Miles. | km. | Miles. |
|---|---|---|---|---|---|---|---|
| 1000 | 621.4 | 6000 | 3728.2 | 11000 | 6835.1 | 16000 | 9941.9 |
| 2000 | 1242.7 | 7000 | 4349.6 | 12000 | 7456.4 | 17000 | 10563.3 |
| 3000 | 1864.1 | 8000 | 4971.0 | 13000 | 8077.8 | 18000 | 11184.7 |
| 4000 | 2485.5 | 9000 | 5592.3 | 14000 | 8699.2 | 19000 | 11806.0 |
| 5000 | 3106.8 | 10000 | 6213.7 | 15000 | 9320.5 | 20000 | 12427.4 |

TABLE 17.

## INTERCONVERSION OF NAUTICAL AND STATUTE MILES.

1 nautical mile* = 6080.20 feet.

| Nautical Miles. | Statute Miles. | Statute Miles. | Nautical Miles. |
|---|---|---|---|
| 1 | 1.1516 | 1 | 0.8684 |
| 2 | 2.3031 | 2 | 1.7368 |
| 3 | 3.4547 | 3 | 2.6052 |
| 4 | 4.6062 | 4 | 3.4736 |
| 5 | 5.7578 | 5 | 4.3420 |
| 6 | 6.9093 | 6 | 5.2104 |
| 7 | 8.0609 | 7 | 6.0787 |
| 8 | 9.2124 | 8 | 6.9471 |
| 9 | 10.3640 | 9 | 7.8155 |

* As defined by the United States Coast Survey.

TABLE 18.

## CONTINENTAL MEASURES OF LENGTH WITH THEIR METRIC AND ENGLISH EQUIVALENTS.

The asterisk (*) indicates that the measure is obsolete or seldom used.

| Measure. | Metric Equivalent. | English Equivalent. |
|---|---|---|
| El (Netherlands) | 1 meter. | 3.2808 feet. |
| Fathom, Swedish = 6 feet | 1.7814 " | 5.8445 " |
| Foot, Austrian* | 0.31608 " | 1.0370 " |
| old French* | 0.32484 " | 1.0657 " |
| Russian | 0.30480 " | 1 " |
| Rheinlandisch or Rhenish (Prussia*, Denmark, Norway*). | 0.31385 " | 1.0297 " |
| Swedish* | 0.2969 " | 0.9741 " |
| Spanish* = ⅓ vara | 0.2786 " | 0.9140 " |
| *Klafter, Wiener (Vienna) | 1.89648 " | 6.2221 " |
| *Line, old French = $\frac{1}{144}$ foot | 0.22558 cm. | 0.0888 inch. |
| Mile, Austrian post* = 24000 feet | 7.58594 km. | 4.714 statute miles. |
| German sea | 1.852 " | 1.1508 " " |
| Swedish = 36000 feet | 10.69 " | 6.642 " " |
| Norwegian = 36000 feet | 11.2986 " | 7.02 " " |
| Netherlands (mijl) | 1 " | 0.6214 " " |
| Prussian (law of 1868) | 7.500 " | 4.660 " " |
| Danish | 7.5324 " | 4.6804 " " |
| Palm, Netherlands | 0.1 meter. | 0.3281 feet. |
| *Rode, Danish | 3.7662 " | 12.356 " |
| *Ruthe, Prussian, Norwegian | 3.7662 " | 12.356 " |
| Sagene (Russian) | 2.1336 " | 7 " |
| *Toise, old French = 6 feet | 1.9490 " | 6.3943 " |
| *Vara, Spanish | 0.8359 " | 2.7424 " |
| Mexican | 0.8380 " | 2.7493 " |
| Werst, or versta (Russian) = 500 sashjene | 1.0668 km. | 3.500 " |

## CONVERSION OF MEASURES OF TIME AND ANGLE.

Arc into time . . . . . . . . . . . . . . . . . Table 19

Time into arc . . . . . . . . . . . . . . . . . Table 20

Days into decimals of a year and angle . . . . . . . . Table 21

Hours, minutes and seconds into decimals of a day . . . . Table 22

Decimals of a day into hours, minutes and seconds . . . . Table 23

Minutes and seconds into decimals of an hour . . . . . Table 24

Local mean time at apparent noon . . . . . . . . . . Table 25

Sidereal time into mean solar time . . . . . . . . . . Table 26

Mean solar time into sidereal time . . . . . . . . . . Table 27

## ARC INTO TIME.

| ° | h. m. | ° | h. m. | ° | h. m. | ° | h. m. | ° | h. m. | ° | h. m. | ′ | m. s. | ″ | s. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 0 | 60 | 4 0 | 120 | 8 0 | 180 | 12 0 | 240 | 16 0 | 300 | 20 0 | 0 | 0 0 | 0 | 0.000 |
| 1 | 0 4 | 61 | 4 4 | 121 | 8 4 | 181 | 12 4 | 241 | 16 4 | 301 | 20 4 | 1 | 0 4 | 1 | 0.067 |
| 2 | 0 8 | 62 | 4 8 | 122 | 8 8 | 182 | 12 8 | 242 | 16 8 | 302 | 20 8 | 2 | 0 8 | 2 | 0.133 |
| 3 | 0 12 | 63 | 4 12 | 123 | 8 12 | 183 | 12 12 | 243 | 16 12 | 303 | 20 12 | 3 | 0 12 | 3 | 0.200 |
| 4 | 0 16 | 64 | 4 16 | 124 | 8 16 | 184 | 12 16 | 244 | 16 16 | 304 | 20 16 | 4 | 0 16 | 4 | 0.267 |
| 5 | 0 20 | 65 | 4 20 | 125 | 8 20 | 185 | 12 20 | 245 | 16 20 | 305 | 20 20 | 5 | 0 20 | 5 | 0.333 |
| 6 | 0 24 | 66 | 4 24 | 126 | 8 24 | 186 | 12 24 | 246 | 16 24 | 306 | 20 24 | 6 | 0 24 | 6 | 0.400 |
| 7 | 0 28 | 67 | 4 28 | 127 | 8 28 | 187 | 12 28 | 247 | 16 28 | 307 | 20 28 | 7 | 0 28 | 7 | 0.467 |
| 8 | 0 32 | 68 | 4 32 | 128 | 8 32 | 188 | 12 32 | 248 | 16 32 | 308 | 20 32 | 8 | 0 32 | 8 | 0.533 |
| 9 | 0 36 | 69 | 4 36 | 129 | 8 36 | 189 | 12 36 | 249 | 16 36 | 309 | 20 36 | 9 | 0 36 | 9 | 0.600 |
| 10 | 0 40 | 70 | 4 40 | 130 | 8 40 | 190 | 12 40 | 250 | 16 40 | 310 | 20 40 | 10 | 0 40 | 10 | 0.667 |
| 11 | 0 44 | 71 | 4 44 | 131 | 8 44 | 191 | 12 44 | 251 | 16 44 | 311 | 20 44 | 11 | 0 44 | 11 | 0.733 |
| 12 | 0 48 | 72 | 4 48 | 132 | 8 48 | 192 | 12 48 | 252 | 16 48 | 312 | 20 48 | 12 | 0 48 | 12 | 0.800 |
| 13 | 0 52 | 73 | 4 52 | 133 | 8 52 | 193 | 12 52 | 253 | 16 52 | 313 | 20 52 | 13 | 0 52 | 13 | 0.867 |
| 14 | 0 56 | 74 | 4 56 | 134 | 8 56 | 194 | 12 56 | 254 | 16 56 | 314 | 20 56 | 14 | 0 56 | 14 | 0.933 |
| 15 | 1 0 | 75 | 5 0 | 135 | 9 0 | 195 | 13 0 | 255 | 17 0 | 315 | 21 0 | 15 | 1 0 | 15 | 1.000 |
| 16 | 1 4 | 76 | 5 4 | 136 | 9 4 | 196 | 13 4 | 256 | 17 4 | 316 | 21 4 | 16 | 1 4 | 16 | 1.067 |
| 17 | 1 8 | 77 | 5 8 | 137 | 9 8 | 197 | 13 8 | 257 | 17 8 | 317 | 21 8 | 17 | 1 8 | 17 | 1.133 |
| 18 | 1 12 | 78 | 5 12 | 138 | 9 12 | 198 | 13 12 | 258 | 17 12 | 318 | 21 12 | 18 | 1 12 | 18 | 1.200 |
| 19 | 1 16 | 79 | 5 16 | 139 | 9 16 | 199 | 13 16 | 259 | 17 16 | 319 | 21 16 | 19 | 1 16 | 19 | 1.267 |
| 20 | 1 20 | 80 | 5 20 | 140 | 9 20 | 200 | 13 20 | 260 | 17 20 | 320 | 21 20 | 20 | 1 20 | 20 | 1.333 |
| 21 | 1 24 | 81 | 5 24 | 141 | 9 24 | 201 | 13 24 | 261 | 17 24 | 321 | 21 24 | 21 | 1 24 | 21 | 1.400 |
| 22 | 1 28 | 82 | 5 28 | 142 | 9 28 | 202 | 13 28 | 262 | 17 28 | 322 | 21 28 | 22 | 1 28 | 22 | 1.467 |
| 23 | 1 32 | 83 | 5 32 | 143 | 9 32 | 203 | 13 32 | 263 | 17 32 | 323 | 21 32 | 23 | 1 32 | 23 | 1.533 |
| 24 | 1 36 | 84 | 5 36 | 144 | 9 36 | 204 | 13 36 | 264 | 17 36 | 324 | 21 36 | 24 | 1 36 | 24 | 1.600 |
| 25 | 1 40 | 85 | 5 40 | 145 | 9 40 | 205 | 13 40 | 265 | 17 40 | 325 | 21 40 | 25 | 1 40 | 25 | 1.667 |
| 26 | 1 44 | 86 | 5 44 | 146 | 9 44 | 206 | 13 44 | 266 | 17 44 | 326 | 21 44 | 26 | 1 44 | 26 | 1.733 |
| 27 | 1 48 | 87 | 5 48 | 147 | 9 48 | 207 | 13 48 | 267 | 17 48 | 327 | 21 48 | 27 | 1 48 | 27 | 1.800 |
| 28 | 1 52 | 88 | 5 52 | 148 | 9 52 | 208 | 13 52 | 268 | 17 52 | 328 | 21 52 | 28 | 1 52 | 28 | 1.867 |
| 29 | 1 56 | 89 | 5 56 | 149 | 9 56 | 209 | 13 56 | 269 | 17 56 | 329 | 21 56 | 29 | 1 56 | 29 | 1.933 |
| 30 | 2 0 | 90 | 6 0 | 150 | 10 0 | 210 | 14 0 | 270 | 18 0 | 330 | 22 0 | 30 | 2 0 | 30 | 2.000 |
| 31 | 2 4 | 91 | 6 4 | 151 | 10 4 | 211 | 14 4 | 271 | 18 4 | 331 | 22 4 | 31 | 2 4 | 31 | 2.067 |
| 32 | 2 8 | 92 | 6 8 | 152 | 10 8 | 212 | 14 8 | 272 | 18 8 | 332 | 22 8 | 32 | 2 8 | 32 | 2.133 |
| 33 | 2 12 | 93 | 6 12 | 153 | 10 12 | 213 | 14 12 | 273 | 18 12 | 333 | 22 12 | 33 | 2 12 | 33 | 2.200 |
| 34 | 2 16 | 94 | 6 16 | 154 | 10 16 | 214 | 14 16 | 274 | 18 16 | 334 | 22 16 | 34 | 2 16 | 34 | 2.267 |
| 35 | 2 20 | 95 | 6 20 | 155 | 10 20 | 215 | 14 20 | 275 | 18 20 | 335 | 22 20 | 35 | 2 20 | 35 | 2.333 |
| 36 | 2 24 | 96 | 6 24 | 156 | 10 24 | 216 | 14 24 | 276 | 18 24 | 336 | 22 24 | 36 | 2 24 | 36 | 2.400 |
| 37 | 2 28 | 97 | 6 28 | 157 | 10 28 | 217 | 14 28 | 277 | 18 28 | 337 | 22 28 | 37 | 2 28 | 37 | 2.467 |
| 38 | 2 32 | 98 | 6 32 | 158 | 10 32 | 218 | 14 32 | 278 | 18 32 | 338 | 22 32 | 38 | 2 32 | 38 | 2.533 |
| 39 | 2 36 | 99 | 6 36 | 159 | 10 36 | 219 | 14 36 | 279 | 18 36 | 339 | 22 36 | 39 | 2 36 | 39 | 2.600 |
| 40 | 2 40 | 100 | 6 40 | 160 | 10 40 | 220 | 14 40 | 280 | 18 40 | 340 | 22 40 | 40 | 2 40 | 40 | 2.667 |
| 41 | 2 44 | 101 | 6 44 | 161 | 10 44 | 221 | 14 44 | 281 | 18 44 | 341 | 22 44 | 41 | 2 44 | 41 | 2.733 |
| 42 | 2 48 | 102 | 6 48 | 162 | 10 48 | 222 | 14 48 | 282 | 18 48 | 342 | 22 48 | 42 | 2 48 | 42 | 2.800 |
| 43 | 2 52 | 103 | 6 52 | 163 | 10 52 | 223 | 14 52 | 283 | 18 52 | 343 | 22 52 | 43 | 2 52 | 43 | 2.867 |
| 44 | 2 56 | 104 | 6 56 | 164 | 10 56 | 224 | 14 56 | 284 | 18 56 | 344 | 22 56 | 44 | 2 56 | 44 | 2.933 |
| 45 | 3 0 | 105 | 7 0 | 165 | 11 0 | 225 | 15 0 | 285 | 19 0 | 345 | 23 0 | 45 | 3 0 | 45 | 3.000 |
| 46 | 3 4 | 106 | 7 4 | 166 | 11 4 | 226 | 15 4 | 286 | 19 4 | 346 | 23 4 | 46 | 3 4 | 46 | 3.067 |
| 47 | 3 8 | 107 | 7 8 | 167 | 11 8 | 227 | 15 8 | 287 | 19 8 | 347 | 23 8 | 47 | 3 8 | 47 | 3.133 |
| 48 | 3 12 | 108 | 7 12 | 168 | 11 12 | 228 | 15 12 | 288 | 19 12 | 348 | 23 12 | 48 | 3 12 | 48 | 3.200 |
| 49 | 3 16 | 109 | 7 16 | 169 | 11 16 | 229 | 15 16 | 289 | 19 16 | 349 | 23 16 | 49 | 3 16 | 49 | 3.267 |
| 50 | 3 20 | 110 | 7 20 | 170 | 11 20 | 230 | 15 20 | 290 | 19 20 | 350 | 23 20 | 50 | 3 20 | 50 | 3.333 |
| 51 | 3 24 | 111 | 7 24 | 171 | 11 24 | 231 | 15 24 | 291 | 19 24 | 351 | 23 24 | 51 | 3 24 | 51 | 3.400 |
| 52 | 3 28 | 112 | 7 28 | 172 | 11 28 | 232 | 15 28 | 292 | 19 28 | 352 | 23 28 | 52 | 3 28 | 52 | 3.467 |
| 53 | 3 32 | 113 | 7 32 | 173 | 11 32 | 233 | 15 32 | 293 | 19 32 | 353 | 23 32 | 53 | 3 32 | 53 | 3.533 |
| 54 | 3 36 | 114 | 7 36 | 174 | 11 36 | 234 | 15 36 | 294 | 19 36 | 354 | 23 36 | 54 | 3 36 | 54 | 3.600 |
| 55 | 3 40 | 115 | 7 40 | 175 | 11 40 | 235 | 15 40 | 295 | 19 40 | 355 | 23 40 | 55 | 3 40 | 55 | 3.667 |
| 56 | 3 44 | 116 | 7 44 | 176 | 11 44 | 236 | 15 44 | 296 | 19 44 | 356 | 23 44 | 56 | 3 44 | 56 | 3.733 |
| 57 | 3 48 | 117 | 7 48 | 177 | 11 48 | 237 | 15 48 | 297 | 19 48 | 357 | 23 48 | 57 | 3 48 | 57 | 3.800 |
| 58 | 3 52 | 118 | 7 52 | 178 | 11 52 | 238 | 15 52 | 298 | 19 52 | 358 | 23 52 | 58 | 3 52 | 58 | 3.867 |
| 59 | 3 56 | 119 | 7 56 | 179 | 11 56 | 239 | 15 56 | 299 | 19 56 | 359 | 23 56 | 59 | 3 56 | 59 | 3.933 |
| 60 | 4 0 | 120 | 8 0 | 180 | 12 0 | 240 | 16 0 | 300 | 20 0 | 360 | 24 0 | 60 | 4 0 | 60 | 4.000 |

# TIME INTO ARC.

## Hours into Arc.

| Time. | Arc. | Time. | Arc. | Time. | Arc. | Time. | Arc. | Time. | Arc. | Time. | Arc. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| hrs. | ° | hrs. | ° | hrs. | ° | hrs. | ° | hrs. | ° | hrs. | ° |
| 1 | 15 | 5 | 75 | 9 | 135 | 13 | 195 | 17 | 255 | 21 | 315 |
| 2 | 30 | 6 | 90 | 10 | 150 | 14 | 210 | 18 | 270 | 22 | 330 |
| 3 | 45 | 7 | 105 | 11 | 165 | 15 | 225 | 19 | 285 | 23 | 345 |
| 4 | 60 | 8 | 120 | 12 | 180 | 16 | 240 | 20 | 300 | 24 | 360 |

## Minutes of Time into Arc.

| m. | ° ′ | m. | ° ′ | m. | ° ′ |
|---|---|---|---|---|---|
| 1 | 0 15 | 21 | 5 15 | 41 | 10 15 |
| 2 | 0 30 | 22 | 5 30 | 42 | 10 30 |
| 3 | 0 45 | 23 | 5 45 | 43 | 10 45 |
| 4 | 1 0 | 24 | 6 0 | 44 | 11 0 |
| 5 | 1 15 | 25 | 6 15 | 45 | 11 15 |
| 6 | 1 30 | 26 | 6 30 | 46 | 11 30 |
| 7 | 1 45 | 27 | 6 45 | 47 | 11 45 |
| 8 | 2 0 | 28 | 7 0 | 48 | 12 0 |
| 9 | 2 15 | 29 | 7 15 | 49 | 12 15 |
| 10 | 2 30 | 30 | 7 30 | 50 | 12 30 |
| 11 | 2 45 | 31 | 7 45 | 51 | 12 45 |
| 12 | 3 0 | 32 | 8 0 | 52 | 13 0 |
| 13 | 3 15 | 33 | 8 15 | 53 | 13 15 |
| 14 | 3 30 | 34 | 8 30 | 54 | 13 30 |
| 15 | 3 45 | 35 | 8 45 | 55 | 13 45 |
| 16 | 4 0 | 36 | 9 0 | 56 | 14 0 |
| 17 | 4 15 | 37 | 9 15 | 57 | 14 15 |
| 18 | 4 30 | 38 | 9 30 | 58 | 14 30 |
| 19 | 4 45 | 39 | 9 45 | 59 | 14 45 |
| 20 | 5 0 | 40 | 10 0 | 60 | 15 0 |

## Seconds of Time into Arc.

| s. | ′ ″ | s | ′ ″ | s. | ′ ″ |
|---|---|---|---|---|---|
| 1 | 0 15 | 21 | 5 15 | 41 | 10 15 |
| 2 | 0 30 | 22 | 5 30 | 42 | 10 30 |
| 3 | 0 45 | 23 | 5 45 | 43 | 10 45 |
| 4 | 1 0 | 24 | 6 0 | 44 | 11 0 |
| 5 | 1 15 | 25 | 6 15 | 45 | 11 15 |
| 6 | 1 30 | 26 | 6 30 | 46 | 11 30 |
| 7 | 1 45 | 27 | 6 45 | 47 | 11 45 |
| 8 | 2 0 | 28 | 7 0 | 48 | 12 0 |
| 9 | 2 15 | 29 | 7 15 | 49 | 12 15 |
| 10 | 2 30 | 30 | 7 30 | 50 | 12 30 |
| 11 | 2 45 | 31 | 7 45 | 51 | 12 45 |
| 12 | 3 0 | 32 | 8 0 | 52 | 13 0 |
| 13 | 3 15 | 33 | 8 15 | 53 | 13 15 |
| 14 | 3 30 | 34 | 8 30 | 54 | 13 30 |
| 15 | 3 45 | 35 | 8 45 | 55 | 13 45 |
| 16 | 4 0 | 36 | 9 0 | 56 | 14 0 |
| 17 | 4 15 | 37 | 9 15 | 57 | 14 15 |
| 18 | 4 30 | 38 | 9 30 | 58 | 14 30 |
| 19 | 4 45 | 39 | 9 45 | 59 | 14 45 |
| 20 | 5 0 | 40 | 10 0 | 60 | 15 0 |

## Hundredths of a Second of Time into Arc.

| Hundredths of a Second of Time. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| s. | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ | ″ |
| 0.00 | 0.00 | 0.15 | 0.30 | 0.45 | 0.60 | 0.75 | 0.90 | 1.05 | 1.20 | 1.35 |
| .10 | 1.50 | 1.65 | 1.80 | 1.95 | 2.10 | 2.25 | 2.40 | 2.55 | 2.70 | 2.85 |
| .20 | 3.00 | 3.15 | 3.30 | 3.45 | 3.60 | 3.75 | 3.90 | 4.05 | 4.20 | 4.35 |
| .30 | 4.50 | 4.65 | 4.80 | 4.95 | 5.10 | 5.25 | 5.40 | 5.55 | 5.70 | 5.85 |
| .40 | 6.00 | 6.15 | 6.30 | 6.45 | 6.60 | 6.75 | 6.90 | 7.05 | 7.20 | 7.35 |
| 0.50 | 7.50 | 7.65 | 7.80 | 7.95 | 8.10 | 8.25 | 8.40 | 8.55 | 8.70 | 8.85 |
| .60 | 9.00 | 9.15 | 9.30 | 9.45 | 9.60 | 9.75 | 9.90 | 10.05 | 10.20 | 10.35 |
| .70 | 10.50 | 10.65 | 10.80 | 10.95 | 11.10 | 11.25 | 11.40 | 11.55 | 11.70 | 11.85 |
| .80 | 12.00 | 12.15 | 12.30 | 12.45 | 12.60 | 12.75 | 12.90 | 13.05 | 13.20 | 13.35 |
| .90 | 13.50 | 13.65 | 13.80 | 13.95 | 14.10 | 14.25 | 14.40 | 14.55 | 14.70 | 14.85 |

## DAYS INTO DECIMALS OF A YEAR AND ANGLE.

| Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year. | Day of Month. Bissextile Year. | Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year. | Day of Month. Bissextile Year. |
|---|---|---|---|---|---|---|---|---|---|
| **1** | 0.00000 | 0° 0′ | *Jan.* 1 | *Jan.* 1 | **51** | 0.13689 | 49° 17′ | *Feb.* 20 | *Feb.* 20 |
| 2 | .00274 | 0 59 | 2 | 2 | 52 | .13963 | 50 16 | 21 | 21 |
| 3 | .00548 | 1 58 | 3 | 3 | 53 | .14237 | 51 15 | 22 | 22 |
| 4 | .00821 | 2 57 | 4 | 4 | 54 | .14511 | 52 14 | 23 | 23 |
| **5** | 0.01095 | 3 57 | 5 | 5 | **55** | 0.14784 | 53 13 | 24 | 24 |
| 6 | .01369 | 4 56 | 6 | 6 | 56 | .15058 | 54 13 | 25 | 25 |
| 7 | .01643 | 5 55 | 7 | 7 | 57 | .15332 | 55 12 | 26 | 26 |
| 8 | .01916 | 6 54 | 8 | 8 | 58 | .15606 | 56 11 | 27 | 27 |
| 9 | .02190 | 7 53 | 9 | 9 | 59 | .15880 | 57 10 | 28 | 28 |
| **10** | 0.02464 | 8 52 | 10 | 10 | **60** | 0.16153 | 58 9 | *Mar.* 1 | 29 |
| 11 | .02738 | 9 51 | 11 | 11 | 61 | .16427 | 59 8 | 2 | *Mar.* 1 |
| 12 | .03011 | 10 51 | 12 | 12 | 62 | .16701 | 60 7 | 3 | 2 |
| 13 | .03285 | 11 50 | 13 | 13 | 63 | .16975 | 61 7 | 4 | 3 |
| 14 | .03559 | 12 49 | 14 | 14 | 64 | .17248 | 62 6 | 5 | 4 |
| **15** | 0.03833 | 13 48 | 15 | 15 | **65** | 0.17522 | 63 5 | 6 | 5 |
| 16 | .04107 | 14 47 | 16 | 16 | 66 | .17796 | 64 4 | 7 | 6 |
| 17 | .04381 | 15 46 | 17 | 17 | 67 | .18070 | 65 3 | 8 | 7 |
| 18 | .04654 | 16 45 | 18 | 18 | 68 | .18344 | 66 2 | 9 | 8 |
| 19 | .04928 | 17 44 | 19 | 19 | 69 | .18617 | 67 1 | 10 | 9 |
| **20** | 0.05202 | 18 44 | 20 | 20 | **70** | 0.18891 | 68 0 | 11 | 10 |
| 21 | .05476 | 19 43 | 21 | 21 | 71 | .19165 | 69 0 | 12 | 11 |
| 22 | .05749 | 20 42 | 22 | 22 | 72 | .19439 | 69 59 | 13 | 12 |
| 23 | .06023 | 21 41 | 23 | 23 | 73 | .19713 | 70 58 | 14 | 13 |
| 24 | .06297 | 22 40 | 24 | 24 | 74 | .19986 | 71 57 | 15 | 14 |
| **25** | 0.06571 | 23 39 | 25 | 25 | **75** | 0.20260 | 72 56 | 16 | 15 |
| 26 | .06845 | 24 38 | 26 | 26 | 76 | .20534 | 73 55 | 17 | 16 |
| 27 | .07118 | 25 38 | 27 | 27 | 77 | .20808 | 74 54 | 18 | 17 |
| 28 | .07392 | 26 37 | 28 | 28 | 78 | .21081 | 75 54 | 19 | 18 |
| 29 | .07666 | 27 36 | 29 | 29 | 79 | .21355 | 76 53 | 20 | 19 |
| **30** | 0.07940 | 28 35 | 30 | 30 | **80** | 0.21629 | 77 52 | 21 | 20 |
| 31 | .08214 | 29 34 | 31 | 31 | 81 | .21903 | 78 51 | 22 | 21 |
| 32 | .08487 | 30 33 | *Feb.* 1 | *Feb.* 1 | 82 | .22177 | 79 50 | 23 | 22 |
| 33 | .08761 | 31 32 | 2 | 2 | 83 | .22450 | 80 49 | 24 | 23 |
| 34 | .09035 | 32 32 | 3 | 3 | 84 | .22724 | 81 48 | 25 | 24 |
| **35** | 0.09309 | 33 31 | 4 | 4 | **85** | 0.22998 | 82 48 | 26 | 25 |
| 36 | .09582 | 34 30 | 5 | 5 | 86 | .23272 | 83 47 | 27 | 26 |
| 37 | .09856 | 35 29 | 6 | 6 | 87 | .23546 | 84 46 | 28 | 27 |
| 38 | .10130 | 36 28 | 7 | 7 | 88 | .23819 | 85 45 | 29 | 28 |
| 39 | .10404 | 37 27 | 8 | 8 | 89 | .24093 | 86 44 | 30 | 29 |
| **40** | 0.10678 | 38 26 | 9 | 9 | **90** | 0.24367 | 87 43 | 31 | 30 |
| 41 | .10951 | 39 26 | 10 | 10 | 91 | .24641 | 88 42 | *Apr.* 1 | 31 |
| 42 | .11225 | 40 25 | 11 | 11 | 92 | .24914 | 89 42 | 2 | *Apr.* 1 |
| 43 | .11499 | 41 24 | 12 | 12 | 93 | .25188 | 90 41 | 3 | 2 |
| 44 | .11773 | 42 23 | 13 | 13 | 94 | .25462 | 91 40 | 4 | 3 |
| **45** | 0.12047 | 43 22 | 14 | 14 | **95** | 0.25736 | 92 39 | 5 | 4 |
| 46 | .12320 | 44 21 | 15 | 15 | 96 | .26010 | 93 38 | 6 | 5 |
| 47 | .12594 | 45 20 | 16 | 16 | 97 | .26283 | 94 37 | 7 | 6 |
| 48 | .12868 | 46 19 | 17 | 17 | 98 | .26557 | 95 36 | 8 | 7 |
| 49 | .13142 | 47 19 | 18 | 18 | 99 | .26831 | 96 35 | 9 | 8 |
| **50** | 0.13415 | 48 18 | 19 | 19 | **100** | 0.27105 | 97 35 | 10 | 9 |

## DAYS INTO DECIMALS OF A YEAR AND ANGLE.

| Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year. | Day of Month. Bissextile Year. | Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year. | Day of Month. Bissextile Year. |
|---|---|---|---|---|---|---|---|---|---|
| **101** | 0.27379 | 98° 34′ | *Apr.* 11 | *Apr.* 10 | **151** | 0.41068 | 147° 51′ | *May* 31 | *May* 30 |
| 102 | .27652 | 99 33 | 12 | 11 | 152 | .41342 | 148 50 | *June* 1 | 31 |
| 103 | .27926 | 100 32 | 13 | 12 | 153 | .41615 | 149 49 | 2 | *June* 1 |
| 104 | .28200 | 101 31 | 14 | 13 | 154 | .41889 | 150 48 | 3 | 2 |
| **105** | 0.28474 | 102 30 | 15 | 14 | **155** | 0.42163 | 151 47 | 4 | 3 |
| 106 | .28747 | 103 29 | 16 | 15 | 156 | .42437 | 152 46 | 5 | 4 |
| 107 | .29021 | 104 29 | 17 | 16 | 157 | .42710 | 153 45 | 6 | 5 |
| 108 | .29295 | 105 28 | 18 | 17 | 158 | .42984 | 154 45 | 7 | 6 |
| 109 | .29569 | 106 27 | 19 | 18 | 159 | .43258 | 155 44 | 8 | 7 |
| **110** | 0.29843 | 107 26 | 20 | 19 | **160** | 0.43532 | 156 43 | 9 | 8 |
| 111 | .30116 | 108 25 | 21 | 20 | 161 | .43806 | 157 42 | 10 | 9 |
| 112 | .30390 | 109 24 | 22 | 21 | 162 | .44079 | 158 41 | 11 | 10 |
| 113 | .30664 | 110 23 | 23 | 22 | 163 | .44353 | 159 40 | 12 | 11 |
| 114 | .30938 | 111 23 | 24 | 23 | 164 | .44627 | 160 39 | 13 | 12 |
| **115** | 0.31211 | 112 22 | 25 | 24 | **165** | 0.44901 | 161 39 | 14 | 13 |
| 116 | .31485 | 113 21 | 26 | 25 | 166 | .45175 | 162 38 | 15 | 14 |
| 117 | .31759 | 114 20 | 27 | 26 | 167 | .45448 | 163 37 | 16 | 15 |
| 118 | .32033 | 115 19 | 28 | 27 | 168 | .45722 | 164 36 | 17 | 16 |
| 119 | .32307 | 116 18 | 29 | 28 | 169 | .45996 | 165 35 | 18 | 17 |
| **120** | 0.32580 | 117 17 | 30 | 29 | **170** | 0.46270 | 166 34 | 19 | 18 |
| 121 | .32854 | 118 17 | *May* 1 | 30 | 171 | .46543 | 167 33 | 20 | 19 |
| 122 | .33128 | 119 16 | 2 | *May* 1 | 172 | .46817 | 168 33 | 21 | 20 |
| 123 | .33402 | 120 15 | 3 | 2 | 173 | .47091 | 169 32 | 22 | 21 |
| 124 | .33676 | 121 14 | 4 | 3 | 174 | .47365 | 170 31 | 23 | 22 |
| **125** | 0.33949 | 122 13 | 5 | 4 | **175** | 0.47639 | 171 30 | 24 | 23 |
| 126 | .34223 | 123 12 | 6 | 5 | 176 | .47912 | 172 29 | 25 | 24 |
| 127 | .34497 | 124 11 | 7 | 6 | 177 | .48186 | 173 28 | 26 | 25 |
| 128 | .34771 | 125 10 | 8 | 7 | 178 | .48460 | 174 27 | 27 | 26 |
| 129 | .35044 | 126 10 | 9 | 8 | 179 | .48734 | 175 26 | 28 | 27 |
| **130** | 0.35318 | 127 9 | 10 | 9 | **180** | 0.49008 | 176 26 | 29 | 28 |
| 131 | .35592 | 128 8 | 11 | 10 | 181 | .49281 | 177 25 | 30 | 29 |
| 132 | .35866 | 129 7 | 12 | 11 | 182 | .49555 | 178 24 | *July* 1 | 30 |
| 133 | .36140 | 130 6 | 13 | 12 | 183 | .49829 | 179 23 | 2 | *July* 1 |
| 134 | .36413 | 131 5 | 14 | 13 | 184 | .50103 | 180 22 | 3 | 2 |
| **135** | 0.36687 | 132 4 | 15 | 14 | **185** | 0.50376 | 181 21 | 4 | 3 |
| 136 | .36961 | 133 4 | 16 | 15 | 186 | .50650 | 182 20 | 5 | 4 |
| 137 | .37235 | 134 3 | 17 | 16 | 187 | .50924 | 183 20 | 6 | 5 |
| 138 | .37509 | 135 2 | 18 | 17 | 188 | .51198 | 184 19 | 7 | 6 |
| 139 | .37782 | 136 1 | 19 | 18 | 189 | .51472 | 185 18 | 8 | 7 |
| **140** | 0.38056 | 137 0 | 20 | 19 | **190** | 0.51745 | 186 17 | 9 | 8 |
| 141 | .38330 | 137 59 | 21 | 20 | 191 | .52019 | 187 16 | 10 | 9 |
| 142 | .38604 | 138 58 | 22 | 21 | 192 | .52293 | 188 15 | 11 | 10 |
| 143 | .38877 | 139 58 | 23 | 22 | 193 | .52567 | 189 14 | 12 | 11 |
| 144 | .39151 | 140 57 | 24 | 23 | 194 | .52841 | 190 14 | 13 | 12 |
| **145** | 0.39425 | 141 56 | 25 | 24 | **195** | 0.53114 | 191 13 | 14 | 13 |
| 146 | .39699 | 142 55 | 26 | 25 | 196 | .53388 | 192 12 | 15 | 14 |
| 147 | .39973 | 143 54 | 27 | 26 | 197 | .53662 | 193 11 | 16 | 15 |
| 148 | .40246 | 144 53 | 28 | 27 | 198 | .53936 | 194 10 | 17 | 16 |
| 149 | .40520 | 145 52 | 29 | 28 | 199 | .54209 | 195 9 | 18 | 17 |
| **150** | 0.40794 | 146 51 | 30 | 29 | **200** | 0.54483 | 196 8 | 19 | 18 |

## DAYS INTO DECIMALS OF A YEAR AND ANGLE.

| Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year. | Day of Month. Bissextile Year. | Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year. | Day of Month. Bissextile Year. |
|---|---|---|---|---|---|---|---|---|---|
| **201** | 0.54757 | 197° 8′ | *July* 20 | *July* 19 | **251** | 0.68446 | 246° 24′ | *Sept.* 8 | *Sept.* 7 |
| 202 | .55031 | 198 7 | 21 | 20 | 252 | .68720 | 247 24 | 9 | 8 |
| 203 | .55305 | 199 6 | 22 | 21 | 253 | .68994 | 248 23 | 10 | 9 |
| 204 | .55578 | 200 5 | 23 | 22 | 254 | .69268 | 249 22 | 11 | 10 |
| **205** | 0.55852 | 201 4 | 24 | 23 | **255** | 0.69541 | 250 21 | 12 | 11 |
| 206 | .56126 | 202 3 | 25 | 24 | 256 | .69815 | 251 20 | 13 | 12 |
| 207 | .56400 | 203 2 | 26 | 25 | 257 | .70089 | 252 19 | 14 | 13 |
| 208 | .56674 | 204 1 | 27 | 26 | 258 | .70363 | 253 18 | 15 | 14 |
| 209 | .56947 | 205 1 | 28 | 27 | 259 | .70637 | 254 17 | 16 | 15 |
| **210** | 0.57221 | 206 0 | 29 | 28 | **260** | 0.70910 | 255 17 | 17 | 16 |
| 211 | .57495 | 206 59 | 30 | 29 | 261 | .71184 | 256 16 | 18 | 17 |
| 212 | .57769 | 207 58 | 31 | 30 | 262 | .71458 | 257 15 | 19 | 18 |
| 213 | .58042 | 208 57 | *Aug.* 1 | 31 | 263 | .71732 | 258 14 | 20 | 19 |
| 214 | .58316 | 209 56 | 2 | *Aug.* 1 | 264 | .72005 | 259 13 | 21 | 20 |
| **215** | 0.58590 | 210 55 | 3 | 2 | **265** | 0.72279 | 260 12 | 22 | 21 |
| 216 | .58864 | 211 55 | 4 | 3 | 266 | .72553 | 261 11 | 23 | 22 |
| 217 | .59138 | 212 54 | 5 | 4 | 267 | .72827 | 262 11 | 24 | 23 |
| 218 | .59411 | 213 53 | 6 | 5 | 268 | .73101 | 263 10 | 25 | 24 |
| 219 | .59685 | 214 52 | 7 | 6 | 269 | .73374 | 264 9 | 26 | 25 |
| **220** | 0.59959 | 215 51 | 8 | 7 | **270** | 0.73648 | 265 8 | 27 | 26 |
| 221 | .60233 | 216 50 | 9 | 8 | 271 | .73922 | 266 7 | 28 | 27 |
| 222 | .60507 | 217 49 | 10 | 9 | 272 | .74196 | 267 6 | 29 | 28 |
| 223 | .60780 | 218 49 | 11 | 10 | 273 | .74470 | 268 5 | 30 | 29 |
| 224 | .61054 | 219 48 | 12 | 11 | 274 | .74743 | 269 5 | *Oct.* 1 | 30 |
| **225** | 0.61328 | 220 47 | 13 | 12 | **275** | 0.75017 | 270 4 | 2 | *Oct.* 1 |
| 226 | .61602 | 221 46 | 14 | 13 | 276 | .75291 | 271 3 | 3 | 2 |
| 227 | .61875 | 222 45 | 15 | 14 | 277 | .75565 | 272 2 | 4 | 3 |
| 228 | .62149 | 223 44 | 16 | 15 | 278 | .75838 | 273 1 | 5 | 4 |
| 229 | .62423 | 224 43 | 17 | 16 | 279 | .76112 | 274 0 | 6 | 5 |
| **230** | 0.62697 | 225 43 | 18 | 17 | **280** | 0.76386 | 274 59 | 7 | 6 |
| 231 | .62971 | 226 42 | 19 | 18 | 281 | .76660 | 275 59 | 8 | 7 |
| 232 | .63244 | 227 41 | 20 | 19 | 282 | .76934 | 276 58 | 9 | 8 |
| 233 | .63518 | 228 40 | 21 | 20 | 283 | .77207 | 277 57 | 10 | 9 |
| 234 | .63792 | 229 39 | 22 | 21 | 284 | .77481 | 278 56 | 11 | 10 |
| **235** | 0.64066 | 230 38 | 23 | 22 | **285** | 0.77755 | 279 55 | 12 | 11 |
| 236 | .64339 | 231 37 | 24 | 23 | 286 | .78029 | 280 54 | 13 | 12 |
| 237 | .64613 | 232 36 | 25 | 24 | 287 | .78303 | 281 53 | 14 | 13 |
| 238 | .64887 | 233 36 | 26 | 25 | 288 | .78576 | 282 52 | 15 | 14 |
| 239 | .65161 | 234 35 | 27 | 26 | 289 | .78850 | 283 52 | 16 | 15 |
| **240** | 0.65435 | 235 34 | 28 | 27 | **290** | 0.79124 | 284 51 | 17 | 16 |
| 241 | .65708 | 236 33 | 29 | 28 | 291 | .79398 | 285 50 | 18 | 17 |
| 242 | .65982 | 237 32 | 30 | 29 | 292 | .79671 | 286 49 | 19 | 18 |
| 243 | .66256 | 238 31 | 31 | 30 | 293 | .79945 | 287 48 | 20 | 19 |
| 244 | .66530 | 239 30 | *Sept.* 1 | 31 | 294 | .80219 | 288 47 | 21 | 20 |
| **245** | 0.66804 | 240 30 | 2 | *Sept.* 1 | **295** | 0.80493 | 289 46 | 22 | 21 |
| 246 | .67077 | 241 29 | 3 | 2 | 296 | .80767 | 290 46 | 23 | 22 |
| 247 | .67351 | 242 28 | 4 | 3 | 297 | .81040 | 291 45 | 24 | 23 |
| 248 | .67625 | 243 27 | 5 | 4 | 298 | .81314 | 292 44 | 25 | 24 |
| 249 | .67899 | 244 26 | 6 | 5 | 299 | .81588 | 293 43 | 26 | 25 |
| **250** | 0.68172 | 245 25 | 7 | 6 | **300** | 0.81862 | 294 42 | 27 | 26 |

## DAYS INTO DECIMALS OF A YEAR AND ANGLE.

| Day of Year. | Decimal of a Year. | Angle. | Day of Month. Common Year | Day of Month. Bissextile Year. |
|---|---|---|---|---|
| 301 | 0.82136 | 295° 41′ | *Oct.* 28 | *Oct.* 27 |
| 302 | .82409 | 296 40 | 29 | 28 |
| 303 | .82683 | 297 40 | 30 | 29 |
| 304 | .82957 | 298 39 | 31 | 30 |
| 305 | 0.83231 | 299 38 | *Nov.* 1 | 31 |
| 306 | .83504 | 300 37 | 2 | *Nov.* 1 |
| 307 | .83778 | 301 36 | 3 | 2 |
| 308 | .84052 | 302 35 | 4 | 3 |
| 309 | .84326 | 303 34 | 5 | 4 |
| 310 | 0.84600 | 304 34 | 6 | 5 |
| 311 | .84873 | 305 33 | 7 | 6 |
| 312 | .85147 | 306 32 | 8 | 7 |
| 313 | .85421 | 307 31 | 9 | 8 |
| 314 | .85695 | 308 30 | 10 | 9 |
| 315 | 0.85969 | 309 29 | 11 | 10 |
| 316 | .86242 | 310 28 | 12 | 11 |
| 317 | .86516 | 311 27 | 13 | 12 |
| 318 | .86790 | 312 27 | 14 | 13 |
| 319 | .87064 | 313 26 | 15 | 14 |
| 320 | 0.87337 | 314 25 | 16 | 15 |
| 321 | .87611 | 315 24 | 17 | 16 |
| 322 | .87885 | 316 23 | 18 | 17 |
| 323 | .88159 | 317 22 | 19 | 18 |
| 324 | .88433 | 318 21 | 20 | 19 |
| 325 | 0.88706 | 319 21 | 21 | 20 |
| 326 | .88980 | 320 20 | 22 | 21 |
| 327 | .89254 | 321 19 | 23 | 22 |
| 328 | .89528 | 322 18 | 24 | 23 |
| 329 | .89802 | 323 17 | 25 | 24 |
| 330 | 0.90075 | 324 16 | 26 | 25 |
| 331 | .90349 | 325 15 | 27 | 26 |
| 332 | .90623 | 326 15 | 28 | 27 |
| 333 | .90897 | 327 14 | 29 | 28 |
| 334 | .91170 | 328 13 | 30 | 29 |
| 335 | 0.91444 | 329 12 | *Dec.* 1 | 30 |
| 336 | .91718 | 330 11 | 2 | *Dec.* 1 |
| 337 | .91992 | 331 10 | 3 | 2 |
| 338 | .92266 | 332 9 | 4 | 3 |
| 339 | .92539 | 333 9 | 5 | 4 |
| 340 | 0.92813 | 334 8 | 6 | 5 |
| 341 | .93087 | 335 7 | 7 | 6 |
| 342 | .93361 | 336 6 | 8 | 7 |
| 343 | .93634 | 337 5 | 9 | 8 |
| 344 | .93908 | 338 4 | 10 | 9 |
| 345 | 0.94182 | 339 3 | 11 | 10 |
| 346 | .94456 | 340 2 | 12 | 11 |
| 347 | .94730 | 341 2 | 13 | 12 |
| 348 | .95003 | 342 1 | 14 | 13 |
| 349 | .95277 | 343 0 | 15 | 14 |
| 350 | 0.95551 | 343 59 | 16 | 15 |
| 351 | 0.95825 | 344° 58′ | *Dec.* 17 | *Dec.* 16 |
| 352 | .96099 | 345 57 | 18 | 17 |
| 353 | .96372 | 346 56 | 19 | 18 |
| 354 | .96646 | 347 56 | 20 | 19 |
| 355 | 0.96920 | 348 55 | 21 | 20 |
| 356 | .97194 | 349 54 | 22 | 21 |
| 357 | .97467 | 350 53 | 23 | 22 |
| 358 | .97741 | 351 52 | 24 | 23 |
| 359 | .98015 | 352 51 | 25 | 24 |
| 360 | 0.98289 | 353 50 | 26 | 25 |
| 361 | .98563 | 354 50 | 27 | 26 |
| 362 | .98836 | 355 49 | 28 | 27 |
| 363 | .99110 | 356 48 | 29 | 28 |
| 364 | .99384 | 357 47 | 30 | 29 |
| 365 | 0.99658 | 358 46 | 31 | 30 |
| 366 | .99932 | 359 45 | | 31 |

### Conversion for Hours.

| Hrs | Dec. of Year. | Angle. |
|---|---|---|
| 1 | 0.00011 | 2.5′ |
| 2 | 23 | 4.9 |
| 3 | 34 | 7.4 |
| 4 | 46 | 9.9 |
| 5 | 0.00057 | 12.3 |
| 6 | 68 | 14.8 |
| 7 | 80 | 17.2 |
| 8 | 91 | 19.7 |
| 9 | 103 | 22.2 |
| 10 | 0.00114 | 24.6 |
| 11 | 126 | 27.1 |
| 12 | 137 | 29.6 |
| 13 | 148 | 32.0 |
| 14 | 160 | 34.5 |
| 15 | 0.00171 | 37.0 |
| 16 | 183 | 39.4 |
| 17 | 194 | 41.9 |
| 18 | 205 | 44.4 |
| 19 | 217 | 46.8 |
| 20 | 0.00228 | 49.3 |
| 21 | 240 | 51.7 |
| 22 | 251 | 54.2 |
| 23 | 262 | 56.7 |
| 24 | 274 | 59.1 |

### Conversion for Minutes.

| Min. | Dec. of Year. | Angle. |
|---|---|---|
| 1 | 0.00000 | 0.04′ |
| 2 | 0 | .08 |
| 3 | 1 | .12 |
| 4 | 1 | .16 |
| 5 | 0.00001 | 0.21 |
| 6 | 1 | .25 |
| 7 | 1 | .29 |
| 8 | 2 | .33 |
| 9 | 2 | .37 |
| 10 | 0.00002 | 0.41 |
| 20 | 4 | .82 |
| 30 | 6 | 1.23 |
| 40 | 8 | 1.64 |
| 50 | 10 | 2.05 |
| 60 | 0.00011 | 2.46 |

TABLE 22.

## HOURS, MINUTES AND SECONDS INTO DECIMALS OF A DAY.

| Hours. | Day. | Min. | Day. | Min. | Day. | Sec. | Day. | Sec. | Day. |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.041 667 | 1 | 0.000 694 | 31 | 0.021 528 | 1 | 0.000 012 | 31 | 0.000 359 |
| 2 | .083 333 | 2 | .001 389 | 32 | .022 222 | 2 | .000 023 | 32 | .000 370 |
| 3 | .125 000 | 3 | .002 083 | 33 | .022 917 | 3 | .000 035 | 33 | .000 382 |
| 4 | .166 667 | 4 | .002 778 | 34 | .023 611 | 4 | .000 046 | 34 | .000 394 |
| 5 | 0.208 333 | 5 | 0.003 472 | 35 | 0.024 305 | 5 | 0.000 058 | 35 | 0.000 405 |
| 6 | .250 000 | 6 | .004 167 | 36 | .025 000 | 6 | .000 069 | 36 | .000 417 |
| 7 | .291 667 | 7 | .004 861 | 37 | .025 694 | 7 | .000 081 | 37 | .000 428 |
| 8 | .333 333 | 8 | .005 556 | 38 | .026 389 | 8 | .000 093 | 38 | .000 440 |
| 9 | .375 000 | 9 | .006 250 | 39 | .027 083 | 9 | .000 104 | 39 | .000 451 |
| 10 | 0.416 667 | 10 | 0.006 944 | 40 | 0.027 778 | 10 | 0.000 116 | 40 | 0.000 463 |
| 11 | .458 333 | 11 | .007 639 | 41 | .028 472 | 11 | .000 127 | 41 | .000 475 |
| 12 | .500 000 | 12 | .008 333 | 42 | .029 167 | 12 | .000 139 | 42 | .000 486 |
| 13 | .541 667 | 13 | .009 028 | 43 | .029 861 | 13 | .000 150 | 43 | .000 498 |
| 14 | .583 333 | 14 | .009 722 | 44 | .030 556 | 14 | .000 162 | 44 | .000 509 |
| 15 | 0.625 000 | 15 | 0.010 417 | 45 | 0.031 250 | 15 | 0.000 174 | 45 | 0.000 521 |
| 16 | .666 667 | 16 | .011 111 | 46 | .031 944 | 16 | .000 185 | 46 | .000 532 |
| 17 | .708 333 | 17 | .011 806 | 47 | .032 639 | 17 | .000 197 | 47 | .000 544 |
| 18 | .750 000 | 18 | .012 500 | 48 | .033 333 | 18 | .000 208 | 48 | .000 556 |
| 19 | .791 667 | 19 | .013 194 | 49 | .034 028 | 19 | .000 220 | 49 | .000 567 |
| 20 | 0.833 333 | 20 | 0.013 889 | 50 | 0.034 722 | 20 | 0.000 231 | 50 | 0.000 579 |
| 21 | .875 000 | 21 | .014 583 | 51 | .035 417 | 21 | .000 243 | 51 | .000 590 |
| 22 | .916 667 | 22 | .015 278 | 52 | .036 111 | 22 | .000 255 | 52 | .000 602 |
| 23 | .958 333 | 23 | .015 972 | 53 | .036 806 | 23 | .000 266 | 53 | .000 613 |
| 24 | 1.000 000 | 24 | .016 667 | 54 | .037 500 | 24 | .000 278 | 54 | .000 625 |
| | | 25 | 0.017 361 | 55 | 0.038 194 | 25 | 0.000 289 | 55 | 0.000 637 |
| | | 26 | .018 056 | 56 | .038 889 | 26 | .000 301 | 56 | .000 648 |
| | | 27 | .018 750 | 57 | .039 583 | 27 | .000 313 | 57 | .000 660 |
| | | 28 | .019 444 | 58 | .040 278 | 28 | .000 324 | 58 | .000 671 |
| | | 29 | .020 139 | 59 | .040 972 | 29 | .000 336 | 59 | .000 683 |
| | | 30 | 0.020 833 | 60 | 0.041 667 | 30 | 0.000 347 | 60 | .000 694 |

TABLE 23.

## DECIMALS OF A DAY INTO HOURS, MINUTES AND SECONDS.

| Hundredths of a Day. | | | | Ten Thousandths of a Day. | | | Millionths of a Day. | |
|---|---|---|---|---|---|---|---|---|
| d. | h. | m. | s. | d. | min. | sec. | d. | sec. |
| 0.01 | | 14 | 24 | 0.0001 | | 8.64 | 0.000001 | 0.09 |
| .02 | | 28 | 48 | 2 | | 17.28 | 2 | 0.17 |
| .03 | | 43 | 12 | 3 | | 25.92 | 3 | 0.26 |
| .04 | | 57 | 36 | 4 | | 34.56 | 4 | 0.35 |
| 0.05 | 1 | 12 | 0 | 0.0005 | | 43.20 | 0.000005 | 0.43 |
| .06 | 1 | 26 | 24 | 6 | | 51.84 | 6 | 0.52 |
| .07 | 1 | 40 | 48 | 7 | 1 | 0.48 | 7 | 0.60 |
| .08 | 1 | 55 | 12 | 8 | 1 | 9.12 | 8 | 0.69 |
| .09 | 2 | 9 | 36 | 9 | 1 | 17.76 | 9 | 0.78 |
| 0.10 | 2 | 24 | 0 | 0.0010 | 1 | 26.40 | 0.000010 | 0.86 |
| .20 | 4 | 48 | 0 | 20 | 2 | 52.80 | 20 | 1.73 |
| .30 | 7 | 12 | 0 | 30 | 4 | 19.20 | 30 | 2.59 |
| .40 | 9 | 36 | 0 | 40 | 5 | 45.60 | 40 | 3.46 |
| 0.50 | 12 | 0 | 0 | 0.0050 | 7 | 12.00 | 0.000050 | 4.32 |
| .60 | 14 | 24 | 0 | 60 | 8 | 38.40 | 60 | 5.18 |
| .70 | 16 | 48 | 0 | 70 | 10 | 4.80 | 70 | 6.05 |
| .80 | 19 | 12 | 0 | 80 | 11 | 31.20 | 80 | 6.91 |
| .90 | 21 | 36 | 0 | 90 | 12 | 57.60 | 90 | 7.78 |

## MINUTES AND SECONDS INTO DECIMALS OF AN HOUR.

| Min. | Decimals of an hour. | Min. | Decimals of an hour. | Sec. | Decimals of an hour. | Sec. | Decimals of an hour. |
|---|---|---|---|---|---|---|---|
| 1 | 0.016 667 | 31 | 0.516 667 | 1 | 0.000 278 | 31 | 0.008 611 |
| 2 | .033 333 | 32 | .533 333 | 2 | .000 556 | 32 | .008 889 |
| 3 | .050 000 | 33 | .550 000 | 3 | .000 833 | 33 | .009 167 |
| 4 | .066 667 | 34 | .566 667 | 4 | .001 111 | 34 | .009 444 |
| 5 | 0.083 333 | 35 | 0.583 333 | 5 | 0.001 389 | 35 | 0.009 722 |
| 6 | .100 000 | 36 | .600 000 | 6 | .001 667 | 36 | .010 000 |
| 7 | .116 667 | 37 | .616 667 | 7 | .001 944 | 37 | .010 278 |
| 8 | .133 333 | 38 | .633 333 | 8 | .002 222 | 38 | .010 556 |
| 9 | .150 000 | 39 | .650 000 | 9 | .002 500 | 39 | .010 833 |
| 10 | 0.166 667 | 40 | 0.666 667 | 10 | 0.002 778 | 40 | 0.011 111 |
| 11 | .183 333 | 41 | .683 333 | 11 | .003 056 | 41 | .011 389 |
| 12 | .200 000 | 42 | .700 000 | 12 | .003 333 | 42 | .011 667 |
| 13 | .216 667 | 43 | .716 667 | 13 | .003 611 | 43 | .011 944 |
| 14 | .233 333 | 44 | .733 333 | 14 | .003 889 | 44 | .012 222 |
| 15 | 0.250 000 | 45 | 0.750 000 | 15 | 0.004 167 | 45 | 0.012 500 |
| 16 | .266 667 | 46 | .766 667 | 16 | .004 444 | 46 | .012 778 |
| 17 | .283 333 | 47 | .783 333 | 17 | .004 722 | 47 | .013 056 |
| 18 | .300 000 | 48 | .800 000 | 18 | .005 000 | 48 | .013 333 |
| 19 | .316 667 | 49 | .816 667 | 19 | .005 278 | 49 | .013 611 |
| 20 | 0.333 333 | 50 | 0.833 333 | 20 | 0.005 556 | 50 | 0.013 889 |
| 21 | .350 000 | 51 | .850 000 | 21 | .005 833 | 51 | .014 167 |
| 22 | .366 667 | 52 | .866 667 | 22 | .006 111 | 52 | .014 444 |
| 23 | .383 333 | 53 | .883 333 | 23 | .006 389 | 53 | .014 722 |
| 24 | .400 000 | 54 | .900 000 | 24 | .006 667 | 54 | .015 000 |
| 25 | 0.416 667 | 55 | 0.916 667 | 25 | 0.006 944 | 55 | 0.015 278 |
| 26 | .433 333 | 56 | .933 333 | 26 | .007 222 | 56 | .015 556 |
| 27 | .450 000 | 57 | .950 000 | 27 | .007 500 | 57 | .015 833 |
| 28 | .466 667 | 58 | .966 667 | 28 | .007 778 | 58 | .016 111 |
| 29 | .483 333 | 59 | .983 333 | 29 | .008 056 | 59 | .016 389 |
| 30 | 0.500 000 | 60 | 1.000 000 | 30 | 0.008 333 | 60 | 0.016 667 |

TABLE 25.

## LOCAL MEAN TIME AT APPARENT NOON.

| Day of Month. | JAN. | | FEB. | | MAR. | | APR. | | MAY. | | JUNE. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | h. | m. | h. | m. | h. | m. | h. | m. | h. | m. | h. | m. |
| 1 | 12 | 4 | 12 | 14 | 12 | 12 | 12 | 4 | 11 | 57 | 11 | 58 |
| 8 | 12 | 7 | 12 | 14 | 12 | 11 | 12 | 2 | 11 | 56 | 11 | 59 |
| 16 | 12 | 10 | 12 | 14 | 12 | 9 | 12 | 0 | 11 | 56 | 12 | 0 |
| 24 | 12 | 12 | 12 | 13 | 12 | 6 | 11 | 58 | 11 | 57 | 12 | 2 |
| | JULY. | | AUG. | | SEPT. | | OCT. | | NOV. | | DEC. | |
| | h. | m. | h. | m. | h. | m. | h. | m. | h. | m. | h. | m. |
| 1 | 12 | 4 | 12 | 6 | 12 | 0 | 11 | 50 | 11 | 44 | 11 | 49 |
| 8 | 12 | 5 | 12 | 5 | 11 | 58 | 11 | 48 | 11 | 44 | 11 | 52 |
| 16 | 12 | 6 | 12 | 4 | 11 | 55 | 11 | 46 | 11 | 45 | 11 | 56 |
| 24 | 12 | 6 | 12 | 2 | 11 | 52 | 11 | 44 | 11 | 47 | 12 | 0 |

TABLE 26.

## SIDEREAL TIME INTO MEAN SOLAR TIME.

The tabular values are to be *subtracted* from a sidereal time interval.

| Hrs. | Reduction to Mean Time. | Min. | Reduction to Mean Time. | Min. | Reduction to Mean Time. |
|---|---|---|---|---|---|
| h. | m. s. | m. | s. | m. | s. |
| 1 | 0 9.83 | 1 | 0.16 | 31 | 5.08 |
| 2 | 0 19.66 | 2 | 0.33 | 32 | 5.24 |
| 3 | 0 29.49 | 3 | 0.49 | 33 | 5.41 |
| 4 | 0 39.32 | 4 | 0.66 | 34 | 5.57 |
| 5 | 0 49.15 | 5 | 0.82 | 35 | 5.73 |
| 6 | 0 58.98 | 6 | 0.98 | 36 | 5.90 |
| 7 | 1 8.81 | 7 | 1.15 | 37 | 6.06 |
| 8 | 1 18.64 | 8 | 1.31 | 38 | 6.23 |
| 9 | 1 28.47 | 9 | 1.47 | 39 | 6.39 |
| 10 | 1 38.30 | 10 | 1.64 | 40 | 6.55 |
| 11 | 1 48.13 | 11 | 1.80 | 41 | 6.72 |
| 12 | 1 57.95 | 12 | 1.97 | 42 | 6.88 |
| 13 | 2 7.78 | 13 | 2.13 | 43 | 7.04 |
| 14 | 2 17.61 | 14 | 2.29 | 44 | 7.21 |
| 15 | 2 27.44 | 15 | 2.46 | 45 | 7.37 |
| 16 | 2 37.27 | 16 | 2.62 | 46 | 7.54 |
| 17 | 2 47.10 | 17 | 2.79 | 47 | 7.70 |
| 18 | 2 56.93 | 18 | 2.95 | 48 | 7.86 |
| 19 | 3 6.76 | 19 | 3.11 | 49 | 8.03 |
| 20 | 3 16.59 | 20 | 3.28 | 50 | 8.19 |
| 21 | 3 26.42 | 21 | 3.44 | 51 | 8.36 |
| 22 | 3 36.25 | 22 | 3.60 | 52 | 8.52 |
| 23 | 3 46.08 | 23 | 3.77 | 53 | 8.68 |
| 24 | 3 55.91 | 24 | 3.93 | 54 | 8.85 |
| | | 25 | 4.10 | 55 | 9.01 |
| | | 26 | 4.26 | 56 | 9.17 |
| | | 27 | 4.42 | 57 | 9.34 |
| | | 28 | 4.59 | 58 | 9.50 |
| | | 29 | 4.75 | 59 | 9.67 |
| | | 30 | 4.91 | 60 | 9.83 |

TABLE 27.

## MEAN SOLAR TIME INTO SIDEREAL TIME.

The tabular values are to be *added* to a mean solar time interval.

| Hrs. | Reduction to Sidereal Time. | Min. | Reduction to Sidereal Time. | Min. | Reduction to Sidereal Time. |
|---|---|---|---|---|---|
| h. | m. s. | m. | s. | m. | s. |
| 1 | 0 9.86 | 1 | 0.16 | 31 | 5.09 |
| 2 | 0 19.71 | 2 | 0.33 | 32 | 5.26 |
| 3 | 0 29.57 | 3 | 0.49 | 33 | 5.42 |
| 4 | 0 39.43 | 4 | 0.66 | 34 | 5.59 |
| 5 | 0 49.28 | 5 | 0.82 | 35 | 5.75 |
| 6 | 0 59.14 | 6 | 0.99 | 36 | 5.91 |
| 7 | 1 9.00 | 7 | 1.15 | 37 | 6.08 |
| 8 | 1 18.85 | 8 | 1.31 | 38 | 6.24 |
| 9 | 1 28.71 | 9 | 1.48 | 39 | 6.41 |
| 10 | 1 38.56 | 10 | 1.64 | 40 | 6.57 |
| 11 | 1 48.42 | 11 | 1.81 | 41 | 6.74 |
| 12 | 1 58.28 | 12 | 1.97 | 42 | 6.90 |
| 13 | 2 8.13 | 13 | 2.14 | 43 | 7.06 |
| 14 | 2 17.99 | 14 | 2.30 | 44 | 7.23 |
| 15 | 2 27.85 | 15 | 2.46 | 45 | 7.39 |
| 16 | 2 37.70 | 16 | 2.63 | 46 | 7.56 |
| 17 | 2 47.56 | 17 | 2.79 | 47 | 7.72 |
| 18 | 2 57.42 | 18 | 2.96 | 48 | 7.89 |
| 19 | 3 7.27 | 19 | 3.12 | 49 | 8.05 |
| 20 | 3 17.13 | 20 | 3.29 | 50 | 8.21 |
| 21 | 3 26.99 | 21 | 3.45 | 51 | 8.38 |
| 22 | 3 36.84 | 22 | 3.61 | 52 | 8.54 |
| 23 | 3 46.70 | 23 | 3.78 | 53 | 8.71 |
| 24 | 3 56.56 | 24 | 3.94 | 54 | 8.87 |
| | | 25 | 4.11 | 55 | 9.04 |
| | | 26 | 4.27 | 56 | 9.20 |
| | | 27 | 4.44 | 57 | 9.36 |
| | | 28 | 4.60 | 58 | 9.53 |
| | | 29 | 4.76 | 59 | 9.69 |
| | | 30 | 4.93 | 60 | 9.86 |

### Reduction for Seconds—sidereal or mean solar.

The tabular values are to be { *subtracted* from a sidereal / *added* to a mean solar } time interval.

| Sidereal or Mean Time. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| s. | s. | s. | s. | s. | s. | s. | s. | s. | s. | s. |
| 0 | 0.00 | 0.00 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 |
| 10 | .03 | .03 | .03 | .04 | .04 | .04 | .04 | .05 | .05 | .05 |
| 20 | .05 | .06 | .06 | .06 | .07 | .07 | .07 | .07 | .08 | .08 |
| 30 | .08 | .08 | .09 | .09 | .09 | .10 | .10 | .10 | .10 | .11 |
| 40 | .11 | .11 | .11 | .12 | .12 | .12 | .13 | .13 | .13 | .13 |
| 50 | 0.14 | 0.14 | 0.14 | 0.15* | 0.15 | 0.15 | 0.15 | 0.16 | 0.16 | 0.16 |



* Subtract 0.14 from a sidereal time interval.

## CONVERSION OF MEASURES OF WEIGHT.

Conversion of avoirdupois pounds and ounces into kilograms . TABLE 28

Conversion of kilograms into avoirdupois pounds and ounces . TABLE 29

Conversion of grains into grams . . . . . . . . . . . . . TABLE 30

Conversion of grams into grains . . . . . . . . . . . . . TABLE 31

## AVOIRDUPOIS POUNDS AND OUNCES INTO KILOGRAMS.

1 avoirdupois pound = 0.4535924 kilogram.
1 avoirdupois ounce = 0.0283495 kilogram.

| Pounds. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. |
| 0 | 0.0000 | 0.0454 | 0.0907 | 0.1361 | 0.1814 | 0.2268 | 0.2722 | 0.3175 | 0.3629 | 0.4082 |
| 1 | 0.4536 | 0.4990 | 0.5443 | 0.5897 | 0.6350 | 0.6804 | 0.7257 | 0.7711 | 0.8165 | 0.8618 |
| 2 | 0.9072 | 0.9525 | 0.9979 | 1.0433 | 1.0886 | 1.1340 | 1.1793 | 1.2247 | 1.2701 | 1.3154 |
| 3 | 1.3608 | 1.4061 | 1.4515 | 1.4969 | 1.5422 | 1.5876 | 1.6329 | 1.6783 | 1.7237 | 1.7690 |
| 4 | 1.8144 | 1.8597 | 1.9051 | 1.9504 | 1.9958 | 2.0412 | 2.0865 | 2.1319 | 2.1772 | 2.2226 |
| 5 | 2.2680 | 2.3133 | 2.3587 | 2.4040 | 2.4494 | 2.4948 | 2.5401 | 2.5855 | 2.6308 | 2.6762 |
| 6 | 2.7216 | 2.7669 | 2.8123 | 2.8576 | 2.9030 | 2.9484 | 2.9937 | 3.0391 | 3.0844 | 3.1298 |
| 7 | 3.1751 | 3.2205 | 3.2659 | 3.3112 | 3.3566 | 3.4019 | 3.4473 | 3.4927 | 3.5380 | 3.5834 |
| 8 | 3.6287 | 3.6741 | 3.7195 | 3.7648 | 3.8102 | 3.8555 | 3.9009 | 3.9463 | 3.9916 | 4.0370 |
| 9 | 4.0823 | 4.1277 | 4.1731 | 4.2184 | 4.2638 | 4.3091 | 4.3545 | 4.3998 | 4.4452 | 4.4906 |

| Ounces. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. | kg. |
| 0 | 0.0000 | 0.0028 | 0.0057 | 0.0085 | 0.0113 | 0.0142 | 0.0170 | 0.0198 | 0.0227 | 0.0255 |
| 1 | .0283 | .0312 | .0340 | .0369 | .0397 | .0425 | .0454 | .0482 | .0510 | .0539 |
| 2 | .0567 | .0595 | .0624 | .0652 | .0680 | .0709 | .0737 | .0765 | .0794 | .0822 |
| 3 | .0850 | .0879 | .0907 | .0936 | .0964 | .0992 | .1021 | .1049 | .1077 | .1106 |
| 4 | .1134 | .1162 | .1191 | .1219 | .1247 | .1276 | .1304 | .1332 | .1361 | .1389 |
| 5 | 0.1417 | 0.1446 | 0.1474 | 0.1503 | 0.1531 | 0.1559 | 0.1588 | 0.1616 | 0.1644 | 0.1673 |
| 6 | .1701 | .1729 | .1758 | .1786 | .1814 | .1843 | .1871 | .1899 | .1928 | .1956 |
| 7 | .1984 | .2013 | .2041 | .2070 | .2098 | .2126 | .2155 | .2183 | .2211 | .2240 |
| 8 | .2268 | .2296 | .2325 | .2353 | .2381 | .2410 | .2438 | .2466 | .2495 | .2523 |
| 9 | .2551 | .2580 | .2608 | .2637 | .2665 | .2693 | .2722 | .2750 | .2778 | .2807 |
| 10 | 0.2835 | 0.2863 | 0.2892 | 0.2920 | 0.2948 | 0.2977 | 0.3005 | 0.3033 | 0.3062 | 0.3090 |
| 11 | .3118 | .3147 | .3175 | .3203 | .3232 | .3260 | .3289 | .3317 | .3345 | .3374 |
| 12 | .3402 | .3430 | .3459 | .3487 | .3515 | .3544 | .3572 | .3600 | .3629 | .3657 |
| 13 | .3685 | .3714 | .3742 | .3770 | .3799 | .3827 | .3856 | .3884 | .3912 | .3941 |
| 14 | .3969 | .3997 | .4026 | .4054 | .4082 | .4111 | .4139 | .4167 | .4196 | .4224 |
| 15 | .4252 | .4281 | .4309 | .4337 | .4366 | .4394 | .4423 | .4451 | .4479 | .4508 |

## KILOGRAMS INTO AVOIRDUPOIS POUNDS AND OUNCES.

1 kilogram = 2.204622 avoirdupois pounds.

| Kilograms. | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. | Av. lbs. |
| 0 | 0.000 | 0.220 | 0.441 | 0.661 | 0.882 | 1.102 | 1.323 | 1.543 | 1.764 | 1.984 |
| 1 | 2.205 | 2.425 | 2.646 | 2.866 | 3.086 | 3.307 | 3.527 | 3.748 | 3.968 | 4.189 |
| 2 | 4.409 | 4.630 | 4.850 | 5.071 | 5.291 | 5.512 | 5.732 | 5.952 | 6.173 | 6.393 |
| 3 | 6.614 | 6.834 | 7.055 | 7.275 | 7.496 | 7.716 | 7.937 | 8.157 | 8.378 | 8.598 |
| 4 | 8.818 | 9.039 | 9.259 | 9.480 | 9.700 | 9.921 | 10.141 | 10.362 | 10.582 | 10.803 |
| 5 | 11.023 | 11.244 | 11.464 | 11.684 | 11.905 | 12.125 | 12.346 | 12.566 | 12.787 | 13.007 |
| 6 | 13.228 | 13.448 | 13.669 | 13.889 | 14.110 | 14.330 | 14.551 | 14.771 | 14.991 | 15.212 |
| 7 | 15.432 | 15.653 | 15.873 | 16.094 | 16.314 | 16.535 | 16.755 | 16.976 | 17.196 | 17.417 |
| 8 | 17.637 | 17.857 | 18.078 | 18.298 | 18.519 | 18.739 | 18.960 | 19.180 | 19.401 | 19.621 |
| 9 | 19.842 | 20.062 | 20.283 | 20.503 | 20.723 | 20.944 | 21.164 | 21.385 | 21.605 | 21.826 |

| Tenths of a Kilogram into Ounces. | | | | Hundredths of a Kilogram into Decimals of a Pound and Ounces. | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| kg. | Oz. | kg. | Oz. | kg. | Av. lbs. | Oz. | kg. | Av. lbs. | Oz. |
| 0.1 | 3.5274 | 0.6 | 21.1644 | 0.01 | 0.022 = | 0.35 | 0.06 | 0.132 = | 2.12 |
| .2 | 7.0548 | .7 | 24.6918 | .02 | .044 = | 0.71 | .07 | .154 = | 2.47 |
| .3 | 10.5822 | .8 | 28.2192 | .03 | .066 = | 1.06 | .08 | .176 = | 2.82 |
| .4 | 14.1096 | .9 | 31.7466 | .04 | .088 = | 1.41 | .09 | .198 = | 3.17 |
| .5 | 17.6370 | 1.0 | 35.2740 | .05 | .110 = | 1.76 | .10 | .220 = | 3.53 |



## GRAINS INTO GRAMS.

1 grain = 0.06479892 gram.

| Grains. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | grams. | grams. | grams. | grams. | grams. | grams. | grams. | grams. | grams. | grams. |
| 0 | 0.0000 | 0.0648 | 0.1296 | 0.1944 | 0.2592 | 0.3240 | 0.3888 | 0.4536 | 0.5184 | 0.5832 |
| 10 | 0.6480 | 0.7128 | 0.7776 | 0.8424 | 0.9072 | 0.9720 | 1.0368 | 1.1016 | 1.1664 | 1.2312 |
| 20 | 1.2960 | 1.3608 | 1.4256 | 1.4904 | 1.5552 | 1.6200 | 1.6848 | 1.7496 | 1.8144 | 1.8792 |
| 30 | 1.9440 | 2.0088 | 2.0736 | 2.1384 | 2.2032 | 2.2680 | 2.3328 | 2.3976 | 2.4624 | 2.5272 |
| 40 | 2.5920 | 2.6568 | 2.7216 | 2.7864 | 2.8512 | 2.9160 | 2.9808 | 3.0455 | 3.1103 | 3.1751 |
| 50 | 3.2399 | 3.3047 | 3.3695 | 3.4343 | 3.4991 | 3.5639 | 3.6287 | 3.6935 | 3.7583 | 3.8231 |
| 60 | 3.8879 | 3.9527 | 4.0175 | 4.0823 | 4.1471 | 4.2119 | 4.2767 | 4.3415 | 4.4063 | 4.4711 |
| 70 | 4.5359 | 4.6007 | 4.6655 | 4.7303 | 4.7951 | 4.8599 | 4.9247 | 4.9895 | 5.0543 | 5.1191 |
| 80 | 5.1839 | 5.2487 | 5.3135 | 5.3783 | 5.4431 | 5.5079 | 5.5727 | 5.6375 | 5.7023 | 5.7671 |
| 90 | 5.8319 | 5.8967 | 5.9615 | 6.0263 | 6.0911 | 6.1559 | 6.2207 | 6.2855 | 6.3503 | 6.4151 |

| Tenths of a Grain. | | | | Hundredths of a Grain. | | | |
|---|---|---|---|---|---|---|---|
| Grain. | gram. | Grain. | gram. | Grain. | gram. | Grain. | gram. |
| 0.1 | 0.0065 | 0.6 | 0.0389 | 0.01 | 0.0006 | 0.06 | 0.0039 |
| .2 | .0130 | .7 | .0454 | .02 | .0013 | .07 | .0045 |
| .3 | .0194 | .8 | .0518 | .03 | .0019 | .08 | .0052 |
| .4 | .0259 | .9 | .0583 | .04 | .0026 | .09 | .0058 |
| .5 | .0324 | 1.0 | .0648 | .05 | .0032 | .10 | .0065 |

TABLE 31.

## GRAMS INTO GRAINS.

1 gram = 15.432356 grains.

| Grams. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. |
| 0 | 0.00 | 1.54 | 3.09 | 4.63 | 6.17 | 7.72 | 9.26 | 10.80 | 12.35 | 13.89 |
| 1 | 15.43 | 16.98 | 18.52 | 20.06 | 21.61 | 23.15 | 24.69 | 26.24 | 27.78 | 29.32 |
| 2 | 30.86 | 32.41 | 33.95 | 35.49 | 37.04 | 38.58 | 40.12 | 41.67 | 43.21 | 44.75 |
| 3 | 46.30 | 47.84 | 49.38 | 50.93 | 52.47 | 54.01 | 55.56 | 57.10 | 58.64 | 60.19 |
| 4 | 61.73 | 63.27 | 64.82 | 66.36 | 67.90 | 69.45 | 70.99 | 72.53 | 74.08 | 75.62 |
| 5 | 77.16 | 78.71 | 80.25 | 81.79 | 83.33 | 84.88 | 86.42 | 87.96 | 89.51 | 91.05 |
| 6 | 92.59 | 94.14 | 95.68 | 97.22 | 98.77 | 100.31 | 101.85 | 103.40 | 104.94 | 106.48 |
| 7 | 108.03 | 109.57 | 111.11 | 112.66 | 114.20 | 115.74 | 117.29 | 118.83 | 120.37 | 121.92 |
| 8 | 123.46 | 125.00 | 126.55 | 128.09 | 129.63 | 131.18 | 132.72 | 134.26 | 135.80 | 137.35 |
| 9 | 138.89 | 140.43 | 141.98 | 143.52 | 145.06 | 146.61 | 148.15 | 149.69 | 151.24 | 152.78 |
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. | Grains. |
| 0 | 0.00 | 15.43 | 30.86 | 46.30 | 61.73 | 77.16 | 92.59 | 108.03 | 123.46 | 138.89 |
| 10 | 154.32 | 169.76 | 185.19 | 200.62 | 216.05 | 231.49 | 246.92 | 262.35 | 277.78 | 293.21 |
| 20 | 308.65 | 324.08 | 339.51 | 354.94 | 370.38 | 385.81 | 401.24 | 416.67 | 432.11 | 447.54 |
| 30 | 462.97 | 478.40 | 493.84 | 509.27 | 524.70 | 540.13 | 555.56 | 571.00 | 586.43 | 601.86 |
| 40 | 617.29 | 632.73 | 648.16 | 663.59 | 679.02 | 694.46 | 709.89 | 725.32 | 740.75 | 756.19 |
| 50 | 771.62 | 787.05 | 802.48 | 817.91 | 833.35 | 848.78 | 864.21 | 879.64 | 895.08 | 910.51 |
| 60 | 925.94 | 941.37 | 956.81 | 972.24 | 987.67 | 1003.10 | 1018.54 | 1033.97 | 1049.40 | 1064.83 |
| 70 | 1080.26 | 1095.70 | 1111.13 | 1126.56 | 1141.99 | 1157.43 | 1172.86 | 1188.29 | 1203.72 | 1219.16 |
| 80 | 1234.59 | 1250.02 | 1265.45 | 1280.89 | 1296.32 | 1311.75 | 1327.18 | 1342.61 | 1358.05 | 1373.48 |
| 90 | 1388.91 | 1404.34 | 1419.78 | 1435.21 | 1450.64 | 1466.07 | 1481.51 | 1496.94 | 1512.37 | 1527.80 |

| gram. | Grain. | gram. | Grain. | gram. | Grain. | gram. | Grain. |
|---|---|---|---|---|---|---|---|
| 0.01 | 0.154 | 0.06 | 0.926 | 0.001 | 0.015 | 0.006 | 0.093 |
| .02 | .309 | .07 | 1.080 | .002 | .031 | .007 | .108 |
| .03 | .463 | .08 | 1.235 | .003 | .046 | .008 | .123 |
| .04 | .617 | .09 | 1.389 | .004 | .062 | .009 | .139 |
| .05 | .772 | .10 | 1.543 | .005 | .077 | .010 | .154 |

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## SYNOPTIC CONVERSION OF VELOCITIES.

Miles per hour into meters per second, feet per second and kilometers per hour.

| Miles per hour. | Meters per second. | Feet per second. | Kilometers per hour. | Miles per hour. | Meters per second. | Feet per second. | Kilometers per hour. | Miles per hour. | Meters per second. | Feet per second. | Kilometers per hour. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **0.0** | 0.0 | 0.0 | 0.0 | **26.0** | 11.6 | 38.1 | 41.8 | **52.0** | 23.2 | 76.3 | 83.7 |
| 0.5 | 0.2 | 0.7 | 0.8 | 26.5 | 11.8 | 38.9 | 42.6 | 52.5 | 23.5 | 77.0 | 84.5 |
| 1.0 | 0.4 | 1.5 | 1.6 | 27.0 | 12.1 | 39.6 | 43.5 | 53.0 | 23.7 | 77.7 | 85.3 |
| 1.5 | 0.7 | 2.2 | 2.4 | 27.5 | 12.3 | 40.3 | 44.3 | 53.5 | 23.9 | 78.5 | 86.1 |
| 2.0 | 0.9 | 2.9 | 3.2 | 28.0 | 12.5 | 41.1 | 45.1 | 54.0 | 24.1 | 79.2 | 86.9 |
| 2.5 | 1.1 | 3.7 | 4.0 | 28.5 | 12.7 | 41.8 | 45.9 | 54.5 | 24.4 | 79.9 | 87.7 |
| **3.0** | 1.3 | 4.4 | 4.8 | **29.0** | 13.0 | 42.5 | 46.7 | **55.0** | 24.6 | 80.7 | 88.5 |
| 3.5 | 1.6 | 5.1 | 5.6 | 29.5 | 13.2 | 43.3 | 47.5 | 55.5 | 24.8 | 81.4 | 89.3 |
| 4.0 | 1.8 | 5.9 | 6.4 | 30.0 | 13.4 | 44.0 | 48.3 | 56.0 | 25.0 | 82.1 | 90.1 |
| 4.5 | 2.0 | 6.6 | 7.2 | 30.5 | 13.6 | 44.7 | 49.1 | 56.5 | 25.3 | 82.9 | 90.9 |
| 5.0 | 2.2 | 7.3 | 8.0 | 31.0 | 13.9 | 45.5 | 49.9 | 57.0 | 25.5 | 83.6 | 91.7 |
| 5.5 | 2.5 | 8.1 | 8.9 | 31.5 | 14.1 | 46.2 | 50.7 | 57.5 | 25.7 | 84.3 | 92.5 |
| **6.0** | 2.7 | 8.8 | 9.7 | **32.0** | 14.3 | 46.9 | 51.5 | **58.0** | 25.9 | 85.1 | 93.3 |
| 6.5 | 2.9 | 9.5 | 10.5 | 32.5 | 14.5 | 47.7 | 52.3 | 58.5 | 26.2 | 85.8 | 94.1 |
| 7.0 | 3.1 | 10.3 | 11.3 | 33.0 | 14.8 | 48.4 | 53.1 | 59.0 | 26.4 | 86.5 | 95.0 |
| 7.5 | 3.4 | 11.0 | 12.1 | 33.5 | 15.0 | 49.1 | 53.9 | 59.5 | 26.6 | 87.3 | 95.8 |
| 8.0 | 3.6 | 11.7 | 12.9 | 34.0 | 15.2 | 49.9 | 54.7 | 60.0 | 26.8 | 88.0 | 96.6 |
| 8.5 | 3.8 | 12.5 | 13.7 | 34.5 | 15.4 | 50.6 | 55.5 | 60.5 | 27.0 | 88.7 | 97.4 |
| **9.0** | 4.0 | 13.2 | 14.5 | **35.0** | 15.6 | 51.3 | 56.3 | **61.0** | 27.3 | 89.5 | 98.2 |
| 9.5 | 4.2 | 13.9 | 15.3 | 35.5 | 15.9 | 52.1 | 57.1 | 61:5 | 27.5 | 90.2 | 99.0 |
| 10.0 | 4.5 | 14.7 | 16.1 | 36.0 | 16.1 | 52.8 | 57.9 | 62.0 | 27.7 | 90.9 | 99.8 |
| 10.5 | 4.7 | 15.4 | 16.9 | 36.5 | 16.3 | 53.5 | 58.7 | 62.5 | 27.9 | 91.7 | 100.6 |
| 11.0 | 4.9 | 16.1 | 17.7 | 37.0 | 16.5 | 54.3 | 59.5 | 63.0 | 28.2 | 92.4 | 101.4 |
| 11.5 | 5.1 | 16.9 | 18.5 | 37.5 | 16.8 | 55.0 | 60.4 | 63.5 | 28.4 | 93.1 | 102.2 |
| **12.0** | 5.4 | 17.6 | 19.3 | **38.0** | 17.0 | 55.7 | 61.2 | **64.0** | 28.6 | 93.9 | 103.0 |
| 12.5 | 5.6 | 18.3 | 20.1 | 38.5 | 17.2 | 56.5 | 62.0 | 64.5 | 28.8 | 94.6 | 103.8 |
| 13.0 | 5.8 | 19.1 | 20.9 | 39.0 | 17.4 | 57.2 | 62.8 | 65.0 | 29.1 | 95.3 | 104.6 |
| 13.5 | 6.0 | 19.8 | 21.7 | 39.5 | 17.7 | 57.9 | 63.6 | 65.5 | 29.3 | 96.1 | 105.4 |
| 14.0 | 6.3 | 20.5 | 22.5 | 40.0 | 17.9 | 58.7 | 64.4 | 66.0 | 29.5 | 96.8 | 106.2 |
| 14.5 | 6.5 | 21.3 | 23.3 | 40.5 | 18.1 | 59.4 | 65.2 | 66.5 | 29.7 | 97.5 | 107.0 |
| **15.0** | 6.7 | 22.0 | 24.1 | **41.0** | 18.3 | 60.1 | 66.0 | **67.0** | 30.0 | 98.3 | 107.8 |
| 15.5 | 6.9 | 22.7 | 24.9 | 41.5 | 18.6 | 60.9 | 66.8 | 67.5 | 30.2 | 99.0 | 108.6 |
| 16.0 | 7.2 | 23.5 | 25.7 | 42.0 | 18.8 | 61.6 | 67.6 | 68.0 | 30.4 | 99.7 | 109.4 |
| 16.5 | 7.4 | 24.2 | 26.6 | 42.5 | 19.0 | 62.3 | 68.4 | 68.5 | 30.6 | 100.5 | 110.2 |
| 17.0 | 7.6 | 24.9 | 27.4 | 43.0 | 19.2 | 63.1 | 69.2 | 69.0 | 30.8 | 101.2 | 111.0 |
| 17.5 | 7.8 | 25.7 | 28.2 | 43.5 | 19.4 | 63.8 | 70.0 | 69.5 | 31.1 | 101.9 | 111.8 |
| **18.0** | 8.0 | 26.4 | 29.0 | **44.0** | 19.7 | 64.5 | 70.8 | **70.0** | 31.3 | 102.7 | 112.7 |
| 18.5 | 8.3 | 27.1 | 29.8 | 44.5 | 19.9 | 65.3 | 71.6 | 70.5 | 31.5 | 103.4 | 113.5 |
| 19.0 | 8.5 | 27.9 | 30.6 | 45.0 | 20.1 | 66.0 | 72.4 | 71.0 | 31.7 | 104.1 | 114.3 |
| 19.5 | 8.7 | 28.6 | 31.4 | 45.5 | 20.3 | 66.7 | 73.2 | 71.5 | 32.0 | 104.9 | 115.1 |
| 20.0 | 8.9 | 29.3 | 32.2 | 46.0 | 20.6 | 67.5 | 74.0 | 72.0 | 32.2 | 105.6 | 115.9 |
| 20.5 | 9.2 | 30.1 | 33.0 | 46.5 | 20.8 | 68.2 | 74.8 | 72.5 | 32.4 | 106.3 | 116.7 |
| **21.0** | 9.4 | 30.8 | 33.8 | **47.0** | 21.0 | 68.9 | 75.6 | **73.0** | 32.6 | 107.1 | 117.5 |
| 21.5 | 9.6 | 31.5 | 34.6 | 47.5 | 21.2 | 69.7 | 76.4 | 73.5 | 32.9 | 107.8 | 118.3 |
| 22.0 | 9.8 | 32.3 | 35.4 | 48.0 | 21.5 | 70.4 | 77.2 | 74.0 | 33.1 | 108.5 | 119.1 |
| 22.5 | 10.1 | 33.0 | 36.2 | 48.5 | 21.7 | 71.1 | 78.1 | 74.5 | 33.3 | 109.3 | 119.9 |
| 23.0 | 10.3 | 33.7 | 37.0 | 49.0 | 21.9 | 71.9 | 78.9 | 75.0 | 33.5 | 110.0 | 120.7 |
| 23.5 | 10.5 | 34.5 | 37.8 | 49.5 | 22.1 | 72.6 | 79.7 | 75.5 | 33.8 | 110.7 | 121.5 |
| **24.0** | 10.7 | 35.2 | 38.6 | **50.0** | 22.4 | 73.3 | 80.5 | **76.0** | 34.0 | 111.5 | 122.3 |
| 24.5 | 11.0 | 35.9 | 39.4 | 50.5 | 22.6 | 74.1 | 81.3 | 76.5 | 34.2 | 112.2 | 123.1 |
| 25.0 | 11.2 | 36.7 | 40.2 | 51.0 | 22.8 | 74.8 | 82.1 | 77.0 | 34.4 | 112.9 | 123.9 |
| 25.5 | 11.4 | 37.4 | 41.0 | 51.5 | 23.0 | 75.5 | 82.9 | 77.5 | 34.6 | 113.7 | 124.7 |
| 26.0 | 11.6 | 38.1 | 41.8 | 52.0 | 23.2 | 76.3 | 83.7 | 78.0 | 34.9 | 114.4 | 125.5 |

## MILES PER HOUR INTO FEET PER SECOND.

1 mile per hour $= \frac{44}{30}$ feet per second.

| Miles per hour. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Feet per sec. | Feet per sec. | Feet per sec. | Feet per sec. | Feet per sec | Feet per sec. | Feet per sec. | Feet per sec. | Feet per sec. | Feet per sec. |
| 0 | 0.0 | 1.5 | 2.9 | 4.4 | 5.9 | 7.3 | 8.8 | 10.3 | 11.7 | 13.2 |
| 10 | 14.7 | 16.1 | 17.6 | 19.1 | 20.5 | 22.0 | 23.5 | 24.9 | 26.4 | 27.9 |
| 20 | 29.3 | 30.8 | 32.3 | 33.7 | 35.2 | 36.7 | 38.1 | 39.6 | 41.1 | 42.5 |
| 30 | 44.0 | 45.5 | 46.9 | 48.4 | 49.9 | 51.3 | 52.8 | 54.3 | 55.7 | 57.2 |
| 40 | 58.7 | 60.1 | 61.6 | 63.1 | 64.5 | 66.0 | 67.5 | 68.9 | 70.4 | 71.9 |
| 50 | 73.3 | 74.8 | 76.3 | 77.7 | 79.2 | 80.7 | 82.1 | 83.6 | 85.1 | 86.5 |
| 60 | 88.0 | 89.5 | 90.9 | 92.4 | 93.9 | 95.3 | 96.8 | 98.3 | 99.7 | 101.2 |
| 70 | 102.7 | 104.1 | 105.6 | 107.1 | 108.5 | 110.0 | 111.5 | 112.9 | 114.4 | 115.9 |
| 80 | 117.3 | 118.8 | 120.3 | 121.7 | 123.2 | 124.7 | 126.1 | 127.6 | 129.1 | 130.5 |
| 90 | 132.0 | 133.5 | 134.9 | 136.4 | 137.9 | 139.3 | 140.8 | 142.3 | 143.7 | 145.2 |
| 100 | 146.7 | 148.1 | 149.6 | 151.1 | 152.5 | 154.0 | 155.5 | 156.9 | 158.4 | 159.9 |
| 110 | 161.3 | 162.8 | 164.3 | 165.7 | 167.2 | 168.7 | 170.1 | 171.6 | 173.1 | 174.5 |
| 120 | 176.0 | 177.5 | 178.9 | 180.4 | 181.9 | 183.3 | 184.8 | 186.3 | 187.7 | 189.2 |
| 130 | 190.7 | 192.1 | 193.6 | 195.1 | 196.5 | 198.0 | 199.5 | 200.9 | 202.4 | 203.9 |
| 140 | 205.3 | 206.8 | 208.3 | 209.7 | 211.2 | 212.7 | 214.1 | 215.6 | 217.1 | 218.5 |



## FEET PER SECOND INTO MILES PER HOUR.

1 foot per second $= \frac{30}{44}$ miles per hour.

| Feet per sec. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. |
| 0 | 0.0 | 0.7 | 1.4 | 2.0 | 2.7 | 3.4 | 4.1 | 4.8 | 5.5 | 6.1 |
| 10 | 6.8 | 7.5 | 8.2 | 8.9 | 9.5 | 10.2 | 10.9 | 11.6 | 12.3 | 13.0 |
| 20 | 13.6 | 14.3 | 15.0 | 15.7 | 16.4 | 17.0 | 17.7 | 18.4 | 19.1 | 19.8 |
| 30 | 20.5 | 21.1 | 21.8 | 22.5 | 23.2 | 23.9 | 24.5 | 25.2 | 25.9 | 26.6 |
| 40 | 27.3 | 28.0 | 28.6 | 29.3 | 30.0 | 30.7 | 31.4 | 32.0 | 32.7 | 33.4 |
| 50 | 34.1 | 34.8 | 35.5 | 36.1 | 36.8 | 37.5 | 38.2 | 38.9 | 39.5 | 40 2 |
| 60 | 40.9 | 41.6 | 42.3 | 43.0 | 43.6 | 44.3 | 45.0 | 45.7 | 46.4 | 47.0 |
| 70 | 47.7 | 48.4 | 49.1 | 49.8 | 50.5 | 51.1 | 51.8 | 52.5 | 53.2 | 53.9 |
| 80 | 54.5 | 55.2 | 55.9 | 56.6 | 57.3 | 58.0 | 58.6 | 59.3 | 60.0 | 60.7 |
| 90 | 61.4 | 62.0 | 62.7 | 63.4 | 64.1 | 64.8 | 65.5 | 66.1 | 66.8 | 67.5 |
| 100 | 68.2 | 68.9 | 69.5 | 70.2 | 70.9 | 71.6 | 72.3 | 73.0 | 73.6 | 74.3 |
| 110 | 75.0 | 75.7 | 76.4 | 77.0 | 77.7 | 78.4 | 79.1 | 79.8 | 80.5 | 81.1 |
| 120 | 81.8 | 82.5 | 83.2 | 83.9 | 84.5 | 85.2 | 85.9 | 86.6 | 87.3 | 88.0 |
| 130 | 88.6 | 89.3 | 90.0 | 90.7 | 91.4 | 92.0 | 92.7 | 93.4 | 94.1 | 94.8 |
| 140 | 95.5 | 96.1 | 96.8 | 97.5 | 98.2 | 98.9 | 99.5 | 100.2 | 100.9 | 101.6 |
| 150 | 102.3 | 103.0 | 103.6 | 104.3 | 105.0 | 105.7 | 106.4 | 107.0 | 107.7 | 108.4 |
| 160 | 109.1 | 109.8 | 110.5 | 111.1 | 111.8 | 112.5 | 113.2 | 113.9 | 114.5 | 115.2 |
| 170 | 115.9 | 116.6 | 117.3 | 118.0 | 118.6 | 119.3 | 120.0 | 120.7 | 121.4 | 120.0 |
| 180 | 122.7 | 123.4 | 124.1 | 124.8 | 125.5 | 126.1 | 126.8 | 127.5 | 128.2 | 128.9 |
| 190 | 129.5 | 130.2 | 130.9 | 131.6 | 132.3 | 133.0 | 133.6 | 134.3 | 135.0 | 135.7 |

TABLE 35.

## METERS PER SECOND INTO MILES PER HOUR.

1 meter per second = 2.236932 miles per hour.

| Meters per second. | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. |
| 0 | 0.0 | 0.2 | 0.4 | 0.7 | 0.9 | 1.1 | 1.3 | 1.6 | 1.8 | 2.0 |
| 1 | 2.2 | 2.5 | 2.7 | 2.9 | 3.1 | 3.4 | 3.6 | 3.8 | 4.0 | 4.3 |
| 2 | 4.5 | 4.7 | 4.9 | 5.1 | 5.4 | 5.6 | 5.8 | 6.0 | 6.3 | 6.5 |
| 3 | 6.7 | 6.9 | 7.2 | 7.4 | 7.6 | 7.8 | 8.1 | 8.3 | 8.5 | 8.7 |
| 4 | 8.9 | 9.2 | 9.4 | 9.6 | 9.8 | 10.1 | 10.3 | 10.5 | 10.7 | 11.0 |
| 5 | 11.2 | 11.4 | 11.6 | 11.9 | 12.1 | 12.3 | 12.5 | 12.8 | 13.0 | 13.2 |
| 6 | 13.4 | 13.6 | 13.9 | 14.1 | 14.3 | 14.5 | 14.8 | 15.0 | 15.2 | 15.4 |
| 7 | 15.7 | 15.9 | 16.1 | 16.3 | 16.6 | 16.8 | 17.0 | 17.2 | 17.4 | 17.7 |
| 8 | 17.9 | 18.1 | 18.3 | 18.6 | 18.8 | 19.0 | 19.2 | 19.5 | 19.7 | 19.9 |
| 9 | 20.1 | 20.4 | 20.6 | 20.8 | 21.0 | 21.3 | 21.5 | 21.7 | 21.9 | 22.1 |
| 10 | 22.4 | 22.6 | 22.8 | 23.0 | 23.3 | 23.5 | 23.7 | 23.9 | 24.2 | 24.4 |
| 11 | 24.6 | 24.8 | 25.1 | 25.3 | 25.5 | 25.7 | 25.9 | 26.2 | 26.4 | 26.6 |
| 12 | 26.8 | 27.1 | 27.3 | 27.5 | 27.7 | 28.0 | 28.2 | 28.4 | 28.6 | 28.9 |
| 13 | 29.1 | 29.3 | 29.5 | 29.8 | 30.0 | 30.2 | 30.4 | 30.6 | 30.9 | 31.1 |
| 14 | 31.3 | 31.5 | 31.8 | 32.0 | 32.2 | 32.4 | 32.7 | 32.9 | 33.1 | 33.3 |
| 15 | 33.6 | 33.8 | 34.0 | 34.2 | 34.4 | 34.7 | 34.9 | 35.1 | 35.3 | 35.6 |
| 16 | 35.8 | 36.0 | 36.2 | 36.5 | 36.7 | 36.9 | 37.1 | 37.4 | 37.6 | 37.8 |
| 17 | 38.0 | 38.3 | 38.5 | 38.7 | 38.9 | 39.1 | 39.4 | 39.6 | 39.8 | 40.0 |
| 18 | 40.3 | 40.5 | 40.7 | 40.9 | 41.2 | 41.4 | 41.6 | 41.8 | 42.1 | 42.3 |
| 19 | 42.5 | 42.7 | 43.0 | 43.2 | 43.4 | 43.6 | 43.8 | 44.1 | 44.3 | 44.5 |
| 20 | 44.7 | 45.0 | 45.2 | 45.4 | 45.6 | 45.9 | 46.1 | 46.3 | 46.5 | 46.8 |
| 21 | 47.0 | 47.2 | 47.4 | 47.6 | 47.9 | 48.1 | 48.3 | 48.5 | 48.8 | 49.0 |
| 22 | 49.2 | 49.4 | 49.7 | 49.9 | 50.1 | 50.3 | 50.6 | 50.8 | 51.0 | 51.2 |
| 23 | 51.5 | 51.7 | 51.9 | 52.1 | 52.3 | 52.6 | 52.8 | 53.0 | 53.2 | 53.5 |
| 24 | 53.7 | 53.9 | 54.1 | 54.4 | 54.6 | 54.8 | 55.0 | 55.3 | 55.5 | 55.7 |
| 25 | 55.9 | 56.1 | 56.4 | 56.6 | 56.8 | 57.0 | 57.3 | 57.5 | 57.7 | 57.9 |
| 26 | 58.2 | 58.4 | 58.6 | 58.8 | 59.1 | 59.3 | 59.5 | 59.7 | 60.0 | 60.2 |
| 27 | 60.4 | 60.6 | 60.8 | 61.1 | 61.3 | 61.5 | 61.7 | 62.0 | 62.2 | 62.4 |
| 28 | 62.6 | 62.9 | 63.1 | 63.3 | 63.5 | 63.8 | 64.0 | 64.2 | 64.4 | 64.6 |
| 29 | 64.9 | 65.1 | 65.3 | 65.5 | 65.8 | 66.0 | 66.2 | 66.4 | 66.7 | 66.9 |
| 30 | 67.1 | 67.3 | 67.6 | 67.8 | 68.0 | 68.2 | 68.5 | 68.7 | 68.9 | 69.1 |
| 31 | 69.3 | 69.6 | 69.8 | 70.0 | 70.2 | 70.5 | 70.7 | 70.9 | 71.1 | 71.4 |
| 32 | 71.6 | 71.8 | 72.0 | 72.3 | 72.5 | 72.7 | 72.9 | 73.1 | 73.4 | 73.6 |
| 33 | 73.8 | 74.0 | 74.3 | 74.5 | 74.7 | 74.9 | 75.2 | 75.4 | 75.6 | 75.8 |
| 34 | 76.1 | 76.3 | 76.5 | 76.7 | 77.0 | 77.2 | 77.4 | 77.6 | 77.8 | 78.1 |
| 35 | 78.3 | 78.5 | 78.7 | 79.0 | 79.2 | 79.4 | 79.6 | 79.9 | 80.1 | 80.3 |
| 36 | 80.5 | 80.8 | 81.0 | 81.2 | 81.4 | 81.6 | 81.9 | 82.1 | 82.3 | 82.5 |
| 37 | 82.8 | 83.0 | 83.2 | 83.4 | 83.7 | 84.0 | 84.1 | 84.3 | 84.6 | 84.8 |
| 38 | 85.0 | 85.2 | 85.5 | 85.7 | 85.9 | 86.1 | 86.3 | 86.6 | 86.8 | 87.0 |
| 39 | 87.2 | 87.5 | 87.7 | 87.9 | 88.1 | 88.4 | 88.6 | 88.8 | 89.0 | 89.3 |
| 40 | 89.5 | 89.7 | 89.9 | 90.2 | 90.4 | 90.6 | 90.8 | 91.0 | 91.3 | 91.5 |
| 41 | 91.7 | 91.9 | 92.2 | 92.4 | 92.6 | 92.8 | 93.1 | 93.3 | 93.5 | 93.7 |
| 42 | 94.0 | 94.2 | 94.4 | 94.6 | 94.8 | 95.1 | 95.3 | 95.5 | 95.7 | 96.0 |
| 43 | 96.2 | 96.4 | 96.6 | 96.9 | 97.1 | 97.3 | 97.5 | 97.8 | 98.0 | 98.2 |
| 44 | 98.4 | 98.7 | 98.9 | 99.1 | 99.3 | 99.5 | 99.8 | 100.0 | 100.2 | 100.4 |

## METERS PER SECOND INTO MILES PER HOUR.

| Meters per second. | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. | Miles per hr. |
| 45 | 100.7 | 100.9 | 101.1 | 101.3 | 101.6 | 101.8 | 102.0 | 102.2 | 102.5 | 102.7 |
| 46 | 102.9 | 103.1 | 103.3 | 103.6 | 103.8 | 104.0 | 104.2 | 104.5 | 104.7 | 104.9 |
| 47 | 105.1 | 105.4 | 105.6 | 105.8 | 106.0 | 106.3 | 106.5 | 106.7 | 106.9 | 107.2 |
| 48 | 107.4 | 107.6 | 107.8 | 108.0 | 108.3 | 108.5 | 108.7 | 108.9 | 109.2 | 109.4 |
| 49 | 109.6 | 109.8 | 110.1 | 110.3 | 110.5 | 110.7 | 111.0 | 111.2 | 111.4 | 111.6 |
| 50 | 111.8 | 112.1 | 112.3 | 112.5 | 112.7 | 113.0 | 113.2 | 113.4 | 113.6 | 113.9 |
| 51 | 114.1 | 114.3 | 114.5 | 114.8 | 115.0 | 115.2 | 115.4 | 115.7 | 115.9 | 116.1 |
| 52 | 116.3 | 116.6 | 116.8 | 117.0 | 117.2 | 117.4 | 117.7 | 117.9 | 118.1 | 118.3 |
| 53 | 118.6 | 118.8 | 119.0 | 119.2 | 119.5 | 119.7 | 119.9 | 120.1 | 120.4 | 120.6 |
| 54 | 120.8 | 121.0 | 121.3 | 121.5 | 121.7 | 121.9 | 122.1 | 122.4 | 122.6 | 122.8 |
| 55 | 123.0 | 123.3 | 123.5 | 123.7 | 123.9 | 124.2 | 124.4 | 124.6 | 124.8 | 125.1 |
| 56 | 125.3 | 125.5 | 125.7 | 126.0 | 126.2 | 126.4 | 126.6 | 126.8 | 127.1 | 127.3 |
| 57 | 127.5 | 127.8 | 128.0 | 128.2 | 128.4 | 128.6 | 128.9 | 129.1 | 129.3 | 129.5 |
| 58 | 129.7 | 130.0 | 130.2 | 130.4 | 130.7 | 130.9 | 131.1 | 131.3 | 131.6 | 131.8 |
| 59 | 132.0 | 132.2 | 132.5 | 132.7 | 132.9 | 133.1 | 133.3 | 133.6 | 133.8 | 134.0 |



## MILES PER HOUR INTO METERS PER SECOND.

1 mile per hour = 0.4470409 meters per second.

| Miles per hour. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. |
| 0 | 0.00 | 0.45 | 0.89 | 1.34 | 1.79 | 2.24 | 2.68 | 3.13 | 3.58 | 4.02 |
| 10 | 4.47 | 4.92 | 5.36 | 5.81 | 6.26 | 6.71 | 7.15 | 7.60 | 8.05 | 8.49 |
| 20 | 8.94 | 9.39 | 9.83 | 10.28 | 10.73 | 11.18 | 11.62 | 12.07 | 12.52 | 12.96 |
| 30 | 13.41 | 13.86 | 14.31 | 14.75 | 15.20 | 15.65 | 16.09 | 16.54 | 16.99 | 17.43 |
| 40 | 17.88 | 18.33 | 18.78 | 19.22 | 19.67 | 20.12 | 20.56 | 21.01 | 21.46 | 21.90 |
| 50 | 22.35 | 22.80 | 23.25 | 23.69 | 24.14 | 24.59 | 25.03 | 25.48 | 25.93 | 26.37 |
| 60 | 26.82 | 27.27 | 27.72 | 28.16 | 28.61 | 29.06 | 29.50 | 29.95 | 30.40 | 30.85 |
| 70 | 31.29 | 31.74 | 32.19 | 32.63 | 33.08 | 33.53 | 33.98 | 34.42 | 34.87 | 35.32 |
| 80 | 35.76 | 36.21 | 36.66 | 37.10 | 37.55 | 38.00 | 38.44 | 38.89 | 39.34 | 39.79 |
| 90 | 40.23 | 40.68 | 41.13 | 41.57 | 42.02 | 42.47 | 42.92 | 43.36 | 43.81 | 44.26 |
| 100 | 44.70 | 45.15 | 45.60 | 46.04 | 46.49 | 46.94 | 47.39 | 47.83 | 48.28 | 48.73 |
| 110 | 49.17 | 49.62 | 50.07 | 50.51 | 50.96 | 51.41 | 51.86 | 52.30 | 52.75 | 53.20 |
| 120 | 53.64 | 54.09 | 54.54 | 54.98 | 55.43 | 55.88 | 56.33 | 56.77 | 57.22 | 57.67 |
| 130 | 58.12 | 58.56 | 59.01 | 59.46 | 59.90 | 60.35 | 60.80 | 61.24 | 61.69 | 62.14 |
| 140 | 62.59 | 63.03 | 63.48 | 63.93 | 64.37 | 64.82 | 65.27 | 65.72 | 66.16 | 66.61 |

## METERS PER SECOND INTO KILOMETERS PER HOUR.

1 meter per second = 3.6 kilometers per hour.

| Meters per second. | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. |
| 0 | 0.0 | 0.4 | 0.7 | 1.1 | 1.4 | 1.8 | 2.2 | 2.5 | 2.9 | 3.2 |
| 1 | 3.6 | 4.0 | 4.3 | 4.7 | 5.0 | 5.4 | 5.8 | 6.1 | 6.5 | 6.8 |
| 2 | 7.2 | 7.6 | 7.9 | 8.3 | 8.6 | 9.0 | 9.4 | 9.7 | 10.1 | 10.4 |
| 3 | 10.8 | 11.2 | 11.5 | 11.9 | 12.2 | 12.6 | 13.0 | 13.3 | 13.7 | 14.0 |
| 4 | 14.4 | 14.8 | 15.1 | 15.5 | 15.8 | 16.2 | 16.6 | 16.9 | 17.3 | 17.6 |
| 5 | 18.0 | 18.4 | 18.7 | 19.1 | 19.4 | 19.8 | 20.2 | 20.5 | 20.9 | 21.2 |
| 6 | 21.6 | 22.0 | 22.3 | 22.7 | 23.0 | 23.4 | 23.8 | 24.1 | 24.5 | 24.8 |
| 7 | 25.2 | 25.6 | 25.9 | 26.3 | 26.6 | 27.0 | 27.4 | 27.7 | 28.1 | 28.4 |
| 8 | 28.8 | 29.2 | 29.5 | 29.9 | 30.2 | 30.6 | 31.0 | 31.3 | 31.7 | 32.0 |
| 9 | 32.4 | 32.8 | 33.1 | 33.5 | 33.8 | 34.2 | 34.6 | 34.9 | 35.3 | 35.6 |
| 10 | 36.0 | 36.4 | 36.7 | 37.1 | 37.4 | 37.8 | 38.2 | 38.5 | 38.9 | 39.2 |
| 11 | 39.6 | 40.0 | 40.3 | 40.7 | 41.0 | 41.4 | 41.8 | 42.1 | 42.5 | 42.8 |
| 12 | 43.2 | 43.6 | 43.9 | 44.3 | 44.6 | 45.0 | 45.4 | 45.7 | 46.1 | 46.4 |
| 13 | 46.8 | 47.2 | 47.5 | 47.9 | 48.2 | 48.6 | 49.0 | 49.3 | 49.7 | 50.0 |
| 14 | 50.4 | 50.8 | 51.1 | 51.5 | 51.8 | 52.2 | 52.6 | 52.9 | 53.3 | 53.6 |
| 15 | 54.0 | 54.4 | 54.7 | 55.1 | 55.4 | 55.8 | 56.2 | 56.5 | 56.9 | 57.2 |
| 16 | 57.6 | 58.0 | 58.3 | 58.7 | 59.0 | 59.4 | 59.8 | 60.1 | 60.5 | 60.8 |
| 17 | 61.2 | 61.6 | 61.9 | 62.3 | 62.6 | 63.0 | 63.4 | 63.7 | 64.1 | 64.4 |
| 18 | 64.8 | 65.2 | 65.5 | 65.9 | 66.2 | 66.6 | 67.0 | 67.3 | 67.7 | 68.0 |
| 19 | 68.4 | 68.8 | 69.1 | 69.5 | 69.8 | 70.2 | 70.6 | 70.9 | 71.3 | 71.6 |
| 20 | 72.0 | 72.4 | 72.7 | 73.1 | 73.4 | 73.8 | 74.2 | 74.5 | 74.9 | 75.2 |
| 21 | 75.6 | 76.0 | 76.3 | 76.7 | 77.0 | 77.4 | 77.8 | 78.1 | 78.5 | 78.8 |
| 22 | 79.2 | 79.6 | 79.9 | 80.3 | 80.6 | 81.0 | 81.4 | 81.7 | 82.1 | 82.4 |
| 23 | 82.8 | 83.2 | 83.5 | 83.9 | 84.2 | 84.6 | 85.0 | 85.3 | 85.7 | 86.0 |
| 24 | 86.4 | 86.8 | 87.1 | 87.5 | 87.8 | 88.2 | 88.6 | 88.9 | 89.3 | 89.6 |
| 25 | 90.0 | 90.4 | 90.7 | 91.1 | 91.4 | 91.8 | 92.2 | 92.5 | 92.9 | 93.2 |
| 26 | 93.6 | 94.0 | 94.3 | 94.7 | 95.0 | 95.4 | 95.8 | 96.1 | 96.5 | 96.8 |
| 27 | 97.2 | 97.6 | 97.9 | 98.3 | 98.6 | 99.0 | 99.4 | 99.7 | 100.1 | 100.4 |
| 28 | 100.8 | 101.2 | 101.5 | 101.9 | 102.2 | 102.6 | 103.0 | 103.3 | 103.7 | 104.0 |
| 29 | 104.4 | 104.8 | 105.1 | 105.5 | 105.8 | 106.2 | 106.6 | 106.9 | 107.3 | 107.6 |
| 30 | 108.0 | 108.4 | 108.7 | 109.1 | 109.4 | 109.8 | 110.2 | 110.5 | 110.9 | 111.2 |
| 31 | 111.6 | 112.0 | 112.3 | 112.7 | 113.0 | 113.4 | 113.8 | 114.1 | 114.5 | 114.8 |
| 32 | 115.2 | 115.6 | 115.9 | 116.3 | 116.6 | 117.0 | 117.4 | 117.7 | 118.1 | 118.4 |
| 33 | 118.8 | 119.2 | 119.5 | 119.9 | 120.2 | 120.6 | 121.0 | 121.3 | 121.7 | 122.0 |
| 34 | 122.4 | 122.8 | 123.1 | 123.5 | 123.8 | 124.2 | 124.6 | 124.9 | 125.3 | 125.6 |
| 35 | 126.0 | 126.4 | 126.7 | 127.1 | 127.4 | 127.8 | 128.2 | 128.5 | 128.9 | 129.2 |
| 36 | 129.6 | 130.0 | 130.3 | 130.7 | 131.0 | 131.4 | 131.8 | 132.1 | 132.5 | 132.8 |
| 37 | 133.2 | 133.6 | 133.9 | 134.3 | 134.6 | 135.0 | 135.4 | 135.7 | 136.1 | 136.4 |
| 38 | 136.8 | 137.2 | 137.5 | 137.9 | 138.2 | 138.6 | 139.0 | 139.3 | 139.7 | 140.0 |
| 39 | 140.4 | 140.8 | 141.1 | 141.5 | 141.8 | 142.2 | 142.6 | 142.9 | 143.3 | 143.6 |
| 40 | 144.0 | 144.4 | 144.7 | 145.1 | 145.4 | 145.8 | 146.2 | 146.5 | 146.9 | 147.2 |
| 41 | 147.6 | 148.0 | 148.3 | 148.7 | 149.0 | 149.4 | 149.8 | 150.1 | 150.5 | 150.8 |
| 42 | 151.2 | 151.6 | 151.9 | 152.3 | 152.6 | 153.0 | 153.4 | 153.7 | 154.1 | 154.4 |
| 43 | 154.8 | 155.2 | 155.5 | 155.9 | 156.2 | 156.6 | 157.0 | 157.3 | 157.7 | 158.0 |
| 44 | 158.4 | 158.8 | 159.1 | 159.5 | 159.8 | 160.2 | 160.6 | 160.9 | 161.3 | 161.6 |

## METERS PER SECOND INTO KILOMETERS PER HOUR.

| Meters per second. | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. | km. per hr. |
| 45 | 162.0 | 162.4 | 162.7 | 163.1 | 163.4 | 163.8 | 164.2 | 164.5 | 164.9 | 165.2 |
| 46 | 165.6 | 166.0 | 166.3 | 166.7 | 167.0 | 167.4 | 167.8 | 168.1 | 168.5 | 168.8 |
| 47 | 169.2 | 169.6 | 169.9 | 170.3 | 170.6 | 171.0 | 171.4 | 171.7 | 172.1 | 172.4 |
| 48 | 172.8 | 173.2 | 173.5 | 173.9 | 174.2 | 174.6 | 175.0 | 175.3 | 175.7 | 176.0 |
| 49 | 176.4 | 176.8 | 177.1 | 177.5 | 177.8 | 178.2 | 178.6 | 178.9 | 179.3 | 179.6 |
| 50 | 180.0 | 180.4 | 180.7 | 181.1 | 181.4 | 181.8 | 182.2 | 182.5 | 182.9 | 183.2 |
| 51 | 183.6 | 184.0 | 184.3 | 184.7 | 185.0 | 185.4 | 185.8 | 186.1 | 186.5 | 186.8 |
| 52 | 187.2 | 187.6 | 187.9 | 188.3 | 188.6 | 189.0 | 189.4 | 189.7 | 190.1 | 190.4 |
| 53 | 190.8 | 191.2 | 191.5 | 191.9 | 192.2 | 192.6 | 193.0 | 193.3 | 193.7 | 194.0 |
| 54 | 194.4 | 194.8 | 195.1 | 195.5 | 195.8 | 196.2 | 196.6 | 196.9 | 197.3 | 197.6 |
| 55 | 198.0 | 198.4 | 198.7 | 199.1 | 199.4 | 199.8 | 200.2 | 200.5 | 200.9 | 201.2 |
| 56 | 201.6 | 202.0 | 202.3 | 202.7 | 203.0 | 203.4 | 203.8 | 204.1 | 204.5 | 204.8 |
| 57 | 205.2 | 205.6 | 205.9 | 206.3 | 206.6 | 207.0 | 207.4 | 207.7 | 208.1 | 208.4 |
| 58 | 208.8 | 209.2 | 209.5 | 209.9 | 210.2 | 210.6 | 211.0 | 211.3 | 211.7 | 212.0 |
| 59 | 212.4 | 212.8 | 213.1 | 213.5 | 213.8 | 214.2 | 214.6 | 214.9 | 215.3 | 215.6 |



## KILOMETERS PER HOUR INTO METERS PER SECOND.

$$1 \text{ kilometer per hour} = \frac{10}{36} \text{ meters per second.}$$

| Kilometers per hour. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. | meters per sec. |
| 0 | 0.00 | 0.28 | 0.56 | 0.83 | 1.11 | 1.39 | 1.67 | 1.94 | 2.22 | 2.50 |
| 10 | 2.78 | 3.06 | 3.33 | 3.61 | 3.89 | 4.17 | 4.44 | 4.72 | 5.00 | 5.28 |
| 20 | 5.56 | 5.83 | 6.11 | 6.39 | 6.67 | 6.94 | 7.22 | 7.50 | 7.78 | 8.06 |
| 30 | 8.33 | 8.61 | 8.89 | 9.17 | 9.44 | 9.72 | 10.00 | 10.28 | 10.56 | 10.83 |
| 40 | 11.11 | 11.39 | 11.67 | 11.94 | 12.22 | 12.50 | 12.78 | 13.06 | 13.33 | 13.61 |
| 50 | 13.89 | 14.17 | 14.44 | 14.72 | 15.00 | 15.28 | 15.56 | 15.83 | 16.11 | 16.39 |
| 60 | 16.67 | 16.94 | 17.22 | 17.50 | 17.78 | 18.06 | 18.33 | 18.61 | 18.89 | 19.17 |
| 70 | 19.44 | 19.72 | 20.00 | 20.28 | 20.56 | 20.83 | 21.11 | 21.39 | 21.67 | 21.94 |
| 80 | 22.22 | 22.50 | 22.78 | 23.06 | 23.33 | 23.61 | 23.89 | 24.17 | 24.44 | 24.72 |
| 90 | 25.00 | 25.28 | 25.56 | 25.83 | 26.11 | 26.39 | 26.67 | 26.94 | 27.22 | 27.50 |
| 100 | 27.78 | 28.06 | 28.33 | 28.61 | 28.89 | 29.17 | 29.44 | 29.72 | 30.00 | 30.28 |
| 110 | 30.56 | 30.83 | 31.11 | 31.39 | 31.67 | 31.94 | 32.22 | 32.50 | 32.78 | 33.06 |
| 120 | 33.33 | 33.61 | 33.89 | 34.17 | 34.44 | 34.72 | 35.00 | 35.28 | 35.56 | 35.83 |
| 130 | 36.11 | 36.39 | 36.67 | 36.94 | 37.22 | 37.50 | 37.78 | 38.06 | 38.33 | 38.61 |
| 140 | 38.89 | 39.17 | 39.44 | 39.72 | 40.00 | 40.28 | 40.56 | 40.83 | 41.11 | 41.39 |
| 150 | 41.67 | 41.94 | 42.22 | 42.50 | 42.78 | 43.06 | 43.33 | 43.61 | 43.89 | 44.17 |
| 160 | 44.44 | 44.72 | 45.00 | 45.28 | 45.56 | 45.83 | 46.11 | 46.39 | 46.67 | 46.94 |
| 170 | 47.22 | 47.50 | 47.78 | 48.06 | 48.33 | 48.61 | 48.89 | 49.17 | 49.44 | 49.72 |
| 180 | 50.00 | 50.28 | 50.56 | 50.83 | 51.11 | 51.39 | 51.67 | 51.94 | 52.22 | 52.50 |
| 190 | 52.78 | 53.06 | 53.33 | 53.61 | 53.89 | 54.17 | 54.44 | 54.72 | 55.00 | 55.28 |

Table 39.

## SCALE OF VELOCITY EQUIVALENTS OF THE SO-CALLED BEAUFORT SCALE OF WIND.

| Beaufort Number. | Explanatory titles. | Mode of estimating aboard sailing vessels. | Specification for use on land. | Meters per second | Miles per hour. |
|---|---|---|---|---|---|
| 0 | Calm | | Calm, smoke rises vertically. | Less than 0.3 | Less than 1 |
| 1 | Light air | Sufficient wind for working ship | Direction of wind shown by smoke drift, but not by wind vanes. | 0.3–1.5 | 1–3 |
| 2 | Slight breeze | | Wind felt on face; leaves rustle; ordinary vane moved by wind. | 1.6–3.3 | 4–7 |
| 3 | Gentle breeze | | Leaves and small twigs in constant motion; wind extends light flag. | 3.4–5.4 | 8–12 |
| 4 | Moderate breeze | Forces most advantageous for sailing with leading wind and all sail drawing | Raises dust and loose paper; small branches are moved. | 5.5–7.9 | 13–18 |
| 5 | Fresh breeze | | Small trees in leaf begin to sway; crested wavelets form on inland waters. | 8.0–10.7 | 19–24 |
| 6 | Strong breeze | Reduction of sail necessary with leading wind | Large branches in motion; whistling heard in telegraph wires; umbrellas used with difficulty. | 10.8–13.8 | 25–31 |
| 7 | High wind | | Whole trees in motion; inconvenience felt when walking against wind. | 13.9–17.1 | 32–38 |
| 8 | Gale | Considerable reduction of sail necessary even with wind quartering | Breaks twigs off trees; generally impedes progress. | 17.2–20.7 | 39–46 |
| 9 | Strong gale | | Slight structural damage occurs (chimney pots and slate removed). | 20.8–24.4 | 47–54 |
| 10 | Whole gale | Close reefed sail running, or hove to under storm sail | Seldom experienced inland; trees uprooted; considerable structural damage occurs. | 24.5–28.4 | 55–63 |
| 11 | Storm | | Very rarely experienced, accompanied by widespread damage. | 28.5–33.5 | 64–75 |
| 12 | Hurricane | No sail can stand even when running | | 33.6 or above | Above 75 |

## MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

$$\tan \alpha = \frac{E - W + (NE + SE - NW - SW)\cos 45^\circ}{N - S + (NE + NW - SE - SW)\cos 45^\circ}$$

### Multiples of cos 45°.

| Number. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0.0 | 0.7 | 1.4 | 2.1 | 2.8 | 3.5 | 4.2 | 4.9 | 5.7 | 6.4 |
| 10 | 7.1 | 7.8 | 8.5 | 9.2 | 9.9 | 10.6 | 11.3 | 12.0 | 12.7 | 13.4 |
| 20 | 14.1 | 14.8 | 15.6 | 16.3 | 17.0 | 17.7 | 18.4 | 19.1 | 19.8 | 20.5 |
| 30 | 21.2 | 21.9 | 22.6 | 23.3 | 24.0 | 24.7 | 25.5 | 26.2 | 26.9 | 27.6 |
| 40 | 28.3 | 29.0 | 29.7 | 30.4 | 31.1 | 31.8 | 32.5 | 33.2 | 33.9 | 34.6 |
| 50 | 35.4 | 36.1 | 36.8 | 37.5 | 38.2 | 38.9 | 39.6 | 40.3 | 41.0 | 41.7 |
| 60 | 42.4 | 43.1 | 43.8 | 44.5 | 45.3 | 46.0 | 46.7 | 47.4 | 48.1 | 48.8 |
| 70 | 49.5 | 50.2 | 50.9 | 51.6 | 52.3 | 53.0 | 53.7 | 54.4 | 55.2 | 55.9 |
| 80 | 56.6 | 57.3 | 58.0 | 58.7 | 59.4 | 60.1 | 60.8 | 61.5 | 62.2 | 62.9 |
| 90 | 63.6 | 64.3 | 65.1 | 65.8 | 66.5 | 67.2 | 67.9 | 68.6 | 69.3 | 70.0 |
| 100 | 70.7 | 71.4 | 72.1 | 72.8 | 73.5 | 74.2 | 75.0 | 75.7 | 76.4 | 77.1 |
| 110 | 77.8 | 78.5 | 79.2 | 79.9 | 80.6 | 81.3 | 82.0 | 82.7 | 83.4 | 84.1 |
| 120 | 84.9 | 85.6 | 86.3 | 87.0 | 87.7 | 88.4 | 89.1 | 89.8 | 90.5 | 91.2 |
| 130 | 91.9 | 92.6 | 93.3 | 94.0 | 94.8 | 95.5 | 96.2 | 96.9 | 97.6 | 98.3 |
| 140 | 99.0 | 99.7 | 100.4 | 101.1 | 101.8 | 102.5 | 103.2 | 103.9 | 104.7 | 105.4 |
| 150 | 106.1 | 106.8 | 107.5 | 108.2 | 108.9 | 109.6 | 110.3 | 111.0 | 111.7 | 112.4 |
| 160 | 113.1 | 113.8 | 114.6 | 115.3 | 116.0 | 116.7 | 117.4 | 118.1 | 118.8 | 119.5 |
| 170 | 120.2 | 120.9 | 121.6 | 122.3 | 123.0 | 123.7 | 124.5 | 125.2 | 125.9 | 126.6 |
| 180 | 127.3 | 128.0 | 128.7 | 129.4 | 130.1 | 130.8 | 131.5 | 132.2 | 132.9 | 133.6 |
| 190 | 134.4 | 135.1 | 135.8 | 136.5 | 137.2 | 137.9 | 138.6 | 139.3 | 140.0 | 140.7 |
| 200 | 141.4 | 142.1 | 142.8 | 143.5 | 144.2 | 145.0 | 145.7 | 146.4 | 147.1 | 147.8 |

### Form for Computing the Numerator and Denominator.

| Directions. | $E$ | $W$ | $N$ | $S$ | $NE$ | $SW$ | $SE$ | $NW$ |
|---|---|---|---|---|---|---|---|---|
| Observed values. | 7 | 12 | 6 | 26 | 13 | 45 | 2 | 24 |
| | $E-W$ | | $N-S$ | | $NE-SW$ | | $SE-NW$ | |
| | [ −5 ] | | [ −20 ] | | [−32] × $\cos 45^\circ$ | | [−22] × $\cos 45^\circ$ | |
| Numerator($n$). | [ −5 ] | | + | | [ −22.6 ] + [ −15.6 ] = [−43.2] | | | |
| Denominator($d$). | | | [ −20 ] + [ −22.6 ] − [ −15.6 ] = [−27.0] | | | | | |

$\alpha$ is the angle between the mean wind direction and the meridian.

The signs of the numerator ($n$) and denominator ($d$) determine the quadrant in which $\alpha$ lies.

When $n$ and $d$ are positive, $\alpha$ lies between N and E: $\frac{+}{+} = NE.$

When $n$ is positive and $d$ negative, $\alpha$ lies between S and E: $\frac{+}{-} = SE.$

When $n$ and $d$ are negative, $\alpha$ lies between S and W: $\frac{-}{-} = SW.$

When $n$ is negative and $d$ positive, $\alpha$ lies between N and W: $\frac{-}{+} = NW.$

# MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

Values of the mean direction ($\alpha$) or its complement ($90° - \alpha$).

$$\alpha = tan^{-1}\, n/d$$

| *n* or *d*. | DENOMINATOR OR NUMERATOR (*d* OR *n*). | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 |
| 1 | 6° | 4° | 3° | 2° | 2° | 2° | 1° | 1° | 1° | 1° | 1° | 1° | 1° | 1° | 1° | 1° | 1° | 1° | 1° |
| 2 | 11 | 8 | 6 | 5 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| 3 | 17 | 11 | 9 | 7 | 6 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 4 | 22 | 15 | 11 | 9 | 8 | 7 | 6 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 |
| 5 | 27 | 18 | 14 | 11 | 9 | 8 | 7 | 6 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 |
| 6 | 31 | 22 | 17 | 13 | 11 | 10 | 9 | 8 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 3 |
| 7 | 35 | 25 | 19 | 16 | 13 | 11 | 10 | 9 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 |
| 8 | 39 | 28 | 22 | 18 | 15 | 13 | 11 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 5 | 5 | 5 | 5 |
| 9 | 42 | 31 | 24 | 20 | 17 | 14 | 13 | 11 | 10 | 9 | 9 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 |
| 10 | 45 | 34 | 27 | 22 | 18 | 16 | 14 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 |
| 11 | | 36 | 29 | 24 | 20 | 17 | 15 | 14 | 12 | 11 | 10 | 10 | 9 | 8 | 8 | 7 | 7 | 7 | 6 |
| 12 | | 39 | 31 | 26 | 22 | 19 | 17 | 15 | 13 | 12 | 11 | 10 | 10 | 9 | 9 | 8 | 8 | 7 | 7 |
| 13 | | 41 | 33 | 27 | 23 | 20 | 18 | 16 | 15 | 13 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 | 7 |
| 14 | | 43 | 35 | 29 | 25 | 22 | 19 | 17 | 16 | 14 | 13 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 15 | | 45 | 37 | 31 | 27 | 23 | 21 | 18 | 17 | 15 | 14 | 13 | 12 | 11 | 11 | 10 | 9 | 9 | 9 |
| 16 | | | 39 | 33 | 28 | 25 | 22 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 11 | 11 | 10 | 10 | 9 |
| 17 | | | 40 | 34 | 30 | 26 | 23 | 21 | 19 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 11 | 10 | 10 |
| 18 | | | 42 | 36 | 31 | 27 | 24 | 22 | 20 | 18 | 17 | 15 | 14 | 13 | 13 | 12 | 11 | 11 | 10 |
| 19 | | | 44 | 37 | 32 | 28 | 25 | 23 | 21 | 19 | 18 | 16 | 15 | 14 | 13 | 13 | 12 | 11 | 11 |
| 20 | | | 45 | 39 | 34 | 30 | 27 | 24 | 22 | 20 | 18 | 17 | 16 | 15 | 14 | 13 | 13 | 12 | 11 |
| 21 | | | | 40 | 35 | 31 | 28 | 25 | 23 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 12 |
| 22 | | | | 41 | 36 | 32 | 29 | 26 | 24 | 22 | 20 | 19 | 17 | 16 | 15 | 15 | 14 | 13 | 12 |
| 23 | | | | 43 | 37 | 33 | 30 | 27 | 25 | 23 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 14 | 13 |
| 24 | | | | 44 | 39 | 34 | 31 | 28 | 26 | 24 | 22 | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 25 | | | | 45 | 40 | 36 | 32 | 29 | 27 | 24 | 23 | 21 | 20 | 18 | 17 | 16 | 16 | 15 | 14 |
| 26 | | | | | 41 | 37 | 33 | 30 | 27 | 25 | 23 | 22 | 20 | 19 | 18 | 17 | 16 | 15 | 15 |
| 27 | | | | | 42 | 38 | 34 | 31 | 28 | 26 | 24 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 |
| 28 | | | | | 43 | 39 | 35 | 32 | 29 | 27 | 25 | 23 | 22 | 20 | 19 | 18 | 17 | 16 | 16 |
| 29 | | | | | 44 | 40 | 36 | 33 | 30 | 28 | 26 | 24 | 23 | 21 | 20 | 19 | 18 | 17 | 16 |
| 30 | | | | | 45 | 41 | 37 | 34 | 31 | 29 | 27 | 25 | 23 | 22 | 21 | 19 | 18 | 18 | 17 |
| 31 | | | | | | 42 | 38 | 35 | 32 | 29 | 27 | 25 | 24 | 22 | 21 | 20 | 19 | 18 | 17 |
| 32 | | | | | | 42 | 39 | 35 | 33 | 30 | 28 | 26 | 25 | 23 | 22 | 21 | 20 | 19 | 18 |
| 33 | | | | | | 43 | 40 | 36 | 33 | 31 | 29 | 27 | 25 | 24 | 22 | 21 | 20 | 19 | 18 |
| 34 | | | | | | 44 | 40 | 37 | 34 | 32 | 30 | 28 | 26 | 24 | 23 | 22 | 21 | 20 | 19 |
| 35 | | | | | | 45 | 41 | 38 | 35 | 32 | 30 | 28 | 27 | 25 | 24 | 22 | 21 | 20 | 19 |
| 36 | | | | | | | 42 | 39 | 36 | 33 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 | 20 |
| 37 | | | | | | | 43 | 39 | 37 | 34 | 32 | 30 | 28 | 26 | 25 | 24 | 22 | 21 | 20 |
| 38 | | | | | | | 44 | 40 | 37 | 35 | 32 | 30 | 28 | 27 | 25 | 24 | 23 | 22 | 21 |
| 39 | | | | | | | 44 | 41 | 38 | 35 | 33 | 31 | 29 | 27 | 26 | 25 | 23 | 22 | 21 |
| 40 | | | | | | | 45 | 42 | 39 | 36 | 34 | 32 | 30 | 28 | 27 | 25 | 24 | 23 | 22 |
| 41 | | | | | | | | 42 | 39 | 37 | 34 | 32 | 30 | 29 | 27 | 26 | 24 | 23 | 22 |
| 42 | | | | | | | | 43 | 40 | 37 | 35 | 33 | 31 | 29 | 28 | 26 | 25 | 24 | 23 |
| 43 | | | | | | | | 44 | 41 | 38 | 36 | 33 | 32 | 30 | 28 | 27 | 26 | 24 | 23 |
| 44 | | | | | | | | 44 | 41 | 39 | 36 | 34 | 32 | 30 | 29 | 27 | 26 | 25 | 24 |
| 45 | | | | | | | | 45 | 42 | 39 | 37 | 35 | 33 | 31 | 29 | 28 | 27 | 25 | 24 |
| 46 | | | | | | | | | 43 | 40 | 37 | 35 | 33 | 32 | 30 | 28 | 27 | 26 | 25 |
| 47 | | | | | | | | | 43 | 41 | 38 | 36 | 34 | 32 | 30 | 29 | 28 | 26 | 25 |
| 48 | | | | | | | | | 44 | 41 | 39 | 36 | 34 | 33 | 31 | 29 | 28 | 27 | 26 |
| 49 | | | | | | | | | 44 | 42 | 39 | 37 | 35 | 33 | 31 | 30 | 29 | 27 | 26 |
| 50 | | | | | | | | | 45 | 42 | 40 | 38 | 36 | 34 | 32 | 30 | 29 | 28 | 27 |

## MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

Values of the mean direction ($\alpha$) or its complement ($90° - \alpha$).

| $n$ or $d$. | DENOMINATOR OR NUMERATOR ($d$ OR $n$). | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 145 | 150 |
| 1 | 1° | 1° | 0° | 0° | 0° | 0° | 0° | 0° | 0° | 0° |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 5 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 |
| 7 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 8 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 |
| 9 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| 10 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| 11 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 |
| 12 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| 13 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 |
| 14 | 8 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 5 |
| 15 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 |
| 16 | 9 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 |
| 17 | 9 | 9 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 6 |
| 18 | 10 | 9 | 9 | 9 | 8 | 8 | 8 | 7 | 7 | 7 |
| 19 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 | 7 | 7 |
| 20 | 11 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 | 8 |
| 21 | 11 | 11 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 |
| 22 | 12 | 11 | 11 | 10 | 10 | 10 | 9 | 9 | 9 | 8 |
| 23 | 12 | 12 | 11 | 11 | 10 | 10 | 10 | 9 | 9 | 9 |
| 24 | 13 | 12 | 12 | 11 | 11 | 10 | 10 | 10 | 9 | 9 |
| 25 | 13 | 13 | 12 | 12 | 11 | 11 | 10 | 10 | 10 | 9 |
| 26 | 14 | 13 | 13 | 12 | 12 | 11 | 11 | 11 | 10 | 10 |
| 27 | 14 | 14 | 13 | 13 | 12 | 12 | 11 | 11 | 11 | 10 |
| 28 | 15 | 14 | 14 | 13 | 13 | 12 | 12 | 11 | 11 | 11 |
| 29 | 15 | 15 | 14 | 14 | 13 | 13 | 12 | 12 | 11 | 11 |
| 30 | 16 | 15 | 15 | 14 | 13 | 13 | 13 | 12 | 12 | 11 |
| 31 | 16 | 16 | 15 | 14 | 14 | 13 | 13 | 12 | 12 | 12 |
| 32 | 17 | 16 | 16 | 15 | 14 | 14 | 13 | 13 | 12 | 12 |
| 33 | 17 | 17 | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 12 |
| 34 | 18 | 17 | 16 | 16 | 15 | 15 | 14 | 14 | 13 | 13 |
| 35 | 18 | 18 | 17 | 16 | 16 | 15 | 15 | 14 | 14 | 13 |
| 36 | 19 | 18 | 17 | 17 | 16 | 15 | 15 | 14 | 14 | 13 |
| 37 | 19 | 19 | 18 | 17 | 16 | 16 | 15 | 15 | 14 | 14 |
| 38 | 20 | 19 | 18 | 18 | 17 | 16 | 16 | 15 | 15 | 14 |
| 39 | 20 | 20 | 19 | 18 | 17 | 17 | 16 | 16 | 15 | 15 |
| 40 | 21 | 20 | 19 | 18 | 18 | 17 | 17 | 16 | 15 | 15 |
| 41 | 21 | 20 | 20 | 19 | 18 | 18 | 17 | 16 | 16 | 15 |
| 42 | 22 | 21 | 20 | 19 | 19 | 18 | 17 | 17 | 16 | 16 |
| 43 | 22 | 21 | 21 | 20 | 19 | 18 | 18 | 17 | 17 | 16 |
| 44 | 23 | 22 | 21 | 20 | 19 | 19 | 18 | 17 | 17 | 16 |
| 45 | 23 | 22 | 21 | 21 | 20 | 19 | 18 | 18 | 17 | 17 |
| 46 | 24 | 23 | 22 | 21 | 20 | 19 | 19 | 18 | 18 | 17 |
| 47 | 24 | 23 | 22 | 21 | 21 | 20 | 19 | 19 | 18 | 17 |
| 48 | 25 | 24 | 23 | 22 | 21 | 20 | 20 | 19 | 18 | 18 |
| 49 | 25 | 24 | 23 | 22 | 21 | 21 | 20 | 19 | 19 | 18 |
| 50 | 25 | 24 | 23 | 23 | 22 | 21 | 20 | 20 | 19 | 18 |

## MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

Values of the mean direction ($\alpha$) or its complement ($90° - \alpha$).

| $n$ or $d$. | DENOMINATOR OR NUMERATOR ($d$ OR $n$). | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 |
| 1 | 0° | 0° | 0° | 0° | 0° | 0° | 0° | 0° | 0° | 0° |
| 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 7 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 8 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 |
| 9 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 10 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 11 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| 12 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| 13 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 14 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| 15 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 |
| 16 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 17 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| 18 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 |
| 19 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 5 |
| 20 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 |
| 21 | 8 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 |
| 22 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 6 | 6 |
| 23 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 7 |
| 24 | 9 | 9 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 |
| 25 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 7 | 7 | 7 |
| 26 | 10 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 7 |
| 27 | 10 | 10 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 |
| 28 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 8 | 8 | 8 |
| 29 | 11 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 8 | 8 |
| 30 | 11 | 11 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 9 |
| 31 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 9 | 9 | 9 |
| 32 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 9 | 9 |
| 33 | 12 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 9 |
| 34 | 12 | 12 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | 10 |
| 35 | 13 | 12 | 12 | 12 | 11 | 11 | 11 | 10 | 10 | 10 |
| 36 | 13 | 13 | 12 | 12 | 12 | 11 | 11 | 11 | 10 | 10 |
| 37 | 13 | 13 | 13 | 12 | 12 | 12 | 11 | 11 | 11 | 10 |
| 38 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 11 | 11 | 11 |
| 39 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 11 | 11 |
| 40 | 14 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 11 |
| 41 | 15 | 14 | 14 | 14 | 13 | 13 | 12 | 12 | 12 | 12 |
| 42 | 15 | 15 | 14 | 14 | 13 | 13 | 13 | 12 | 12 | 12 |
| 43 | 16 | 15 | 15 | 14 | 14 | 13 | 13 | 13 | 12 | 12 |
| 44 | 16 | 15 | 15 | 15 | 14 | 14 | 13 | 13 | 13 | 12 |
| 45 | 16 | 16 | 15 | 15 | 14 | 14 | 14 | 13 | 13 | 13 |
| 46 | 17 | 16 | 16 | 15 | 15 | 14 | 14 | 14 | 13 | 13 |
| 47 | 17 | 16 | 16 | 15 | 15 | 15 | 14 | 14 | 14 | 13 |
| 48 | 17 | 17 | 16 | 16 | 15 | 15 | 15 | 14 | 14 | 13 |
| 49 | 18 | 17 | 17 | 16 | 16 | 15 | 15 | 14 | 14 | 14 |
| 50 | 18 | 17 | 17 | 16 | 16 | 16 | 15 | 15 | 14 | 14 |

# MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

**Values of the mean direction ($\alpha$) or its complement ($90°-\alpha$).**

$$\alpha = tan^{-1}\frac{n}{d}.$$

| n or d. | DENOMINATOR OR NUMERATOR (d OR n). | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | 125 | 130 |
| 50 | 42° | 40° | 38° | 36° | 34° | 32° | 30° | 29° | 28° | 27° | 25° | 24° | 23° | 23° | 22° | 21° |
| 52 | 43 | 41 | 39 | 37 | 35 | 33 | 31 | 30 | 29 | 27 | 26 | 25 | 24 | 23 | 23 | 22 |
| 54 | 44 | 42 | 40 | 38 | 36 | 34 | 32 | 31 | 30 | 28 | 27 | 26 | 25 | 24 | 23 | 22 |
| 56 | | 43 | 41 | 39 | 37 | 35 | 33 | 32 | 31 | 29 | 28 | 27 | 26 | 25 | 24 | 23 |
| 58 | | 44 | 42 | 40 | 38 | 36 | 34 | 33 | 31 | 30 | 29 | 28 | 27 | 26 | 25 | 24 |
| 60 | | 45 | 43 | 41 | 39 | 37 | 35 | 34 | 32 | 31 | 30 | 29 | 28 | 27 | 26 | 25 |
| 62 | | | 44 | 42 | 40 | 38 | 36 | 35 | 33 | 32 | 31 | 29 | 28 | 27 | 26 | 25 |
| 64 | | | 45 | 42 | 40 | 39 | 37 | 35 | 34 | 33 | 31 | 30 | 29 | 28 | 27 | 26 |
| 66 | | | | 43 | 41 | 40 | 38 | 36 | 35 | 33 | 32 | 31 | 30 | 29 | 28 | 27 |
| 68 | | | | 44 | 42 | 40 | 39 | 37 | 36 | 34 | 33 | 32 | 31 | 30 | 29 | 28 |
| 70 | | | | 45 | 43 | 41 | 39 | 38 | 36 | 35 | 34 | 32 | 31 | 30 | 29 | 28 |
| 72 | | | | | 44 | 42 | 40 | 39 | 37 | 36 | 34 | 33 | 32 | 31 | 30 | 29 |
| 74 | | | | | 45 | 43 | 41 | 39 | 38 | 37 | 35 | 34 | 33 | 32 | 31 | 30 |
| 76 | | | | | | 44 | 42 | 40 | 39 | 37 | 36 | 35 | 33 | 32 | 31 | 30 |
| 78 | | | | | | 44 | 43 | 41 | 39 | 38 | 37 | 35 | 34 | 33 | 32 | 31 |
| 80 | | | | | | 45 | 43 | 42 | 40 | 39 | 37 | 36 | 35 | 34 | 33 | 32 |
| 82 | | | | | | | 44 | 42 | 41 | 39 | 38 | 37 | 35 | 34 | 33 | 32 |
| 84 | | | | | | | 45 | 43 | 41 | 40 | 39 | 37 | 36 | 35 | 34 | 33 |
| 86 | | | | | | | | 44 | 42 | 41 | 39 | 38 | 37 | 36 | 35 | 33 |
| 88 | | | | | | | | 44 | 43 | 41 | 40 | 39 | 37 | 36 | 35 | 34 |
| 90 | | | | | | | | 45 | 43 | 42 | 41 | 39 | 38 | 37 | 36 | 35 |
| 92 | | | | | | | | | 44 | 43 | 41 | 40 | 39 | 37 | 36 | 35 |
| 94 | | | | | | | | | 45 | 43 | 42 | 41 | 39 | 38 | 37 | 36 |
| 96 | | | | | | | | | | 44 | 42 | 41 | 40 | 39 | 38 | 36 |
| 98 | | | | | | | | | | 44 | 43 | 42 | 40 | 39 | 38 | 37 |
| 100 | | | | | | | | | | 45 | 44 | 42 | 41 | 40 | 39 | 38 |
| 102 | | | | | | | | | | | 44 | 43 | 42 | 40 | 39 | 38 |
| 104 | | | | | | | | | | | 45 | 43 | 42 | 41 | 40 | 39 |
| 106 | | | | | | | | | | | | 44 | 43 | 41 | 40 | 39 |
| 108 | | | | | | | | | | | | 44 | 43 | 42 | 41 | 40 |
| 110 | | | | | | | | | | | | 45 | 44 | 43 | 41 | 40 |
| 112 | | | | | | | | | | | | | 44 | 43 | 42 | 41 |
| 114 | | | | | | | | | | | | | 45 | 44 | 42 | 41 |
| 116 | | | | | | | | | | | | | | 44 | 43 | 42 |
| 118 | | | | | | | | | | | | | | 45 | 43 | 42 |
| 120 | | | | | | | | | | | | | | 45 | 44 | 43 |
| 122 | | | | | | | | | | | | | | | 44 | 43 |
| 124 | | | | | | | | | | | | | | | 45 | 44 |
| 126 | | | | | | | | | | | | | | | | 44 |
| 128 | | | | | | | | | | | | | | | | 45 |
| 130 | | | | | | | | | | | | | | | | 45 |

## MEAN DIRECTION OF THE WIND BY LAMBERT'S FORMULA.

Values of the mean direction ($\alpha$) or its complement ($90° - \alpha$).

| $n$ or $d$. | DENOMINATOR OR NUMERATOR ($d$ OR $n$). | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 |
| 50 | 21° | 20° | 20° | 19° | 18° | 18° | 17° | 17° | 16° | 16° | 16° | 15° | 15° | 14° | 14° |
| 52 | 22 | 21 | 20 | 20 | 19 | 19 | 18 | 17 | 17 | 17 | 16 | 16 | 15 | 15 | 15 |
| 54 | 22 | 22 | 21 | 20 | 20 | 19 | 19 | 18 | 18 | 17 | 17 | 16 | 16 | 15 | 15 |
| 56 | 23 | 23 | 22 | 21 | 20 | 20 | 19 | 19 | 18 | 18 | 17 | 17 | 16 | 16 | 16 |
| 58 | 24 | 23 | 23 | 22 | 21 | 21 | 20 | 19 | 19 | 18 | 18 | 17 | 17 | 17 | 16 |
| 60 | 25 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 19 | 19 | 18 | 18 | 18 | 17 | 17 |
| 62 | 25 | 25 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 20 | 19 | 19 | 18 | 18 | 17 |
| 64 | 26 | 25 | 25 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 20 | 19 | 19 | 18 | 18 |
| 66 | 27 | 26 | 25 | 24 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 20 | 19 | 19 | 18 |
| 68 | 28 | 27 | 26 | 25 | 24 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 20 | 19 | 19 |
| 70 | 28 | 27 | 27 | 26 | 25 | 24 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 20 | 19 |
| 72 | 29 | 28 | 27 | 26 | 26 | 25 | 24 | 24 | 23 | 22 | 22 | 21 | 21 | 20 | 20 |
| 74 | 30 | 29 | 28 | 27 | 26 | 26 | 25 | 24 | 24 | 23 | 22 | 22 | 21 | 21 | 20 |
| 76 | 30 | 29 | 28 | 28 | 27 | 26 | 25 | 25 | 24 | 23 | 23 | 22 | 22 | 21 | 21 |
| 78 | 31 | 30 | 29 | 28 | 27 | 27 | 26 | 25 | 25 | 24 | 23 | 23 | 22 | 22 | 21 |
| 80 | 32 | 31 | 30 | 29 | 28 | 27 | 27 | 26 | 25 | 25 | 24 | 23 | 23 | 22 | 22 |
| 82 | 32 | 31 | 30 | 29 | 29 | 28 | 27 | 26 | 26 | 25 | 24 | 24 | 23 | 23 | 22 |
| 84 | 33 | 32 | 31 | 30 | 29 | 28 | 28 | 27 | 26 | 26 | 25 | 24 | 24 | 23 | 23 |
| 86 | 33 | 32 | 32 | 31 | 30 | 29 | 28 | 28 | 27 | 26 | 26 | 25 | 24 | 24 | 23 |
| 88 | 34 | 33 | 32 | 31 | 30 | 30 | 29 | 28 | 27 | 27 | 26 | 25 | 25 | 24 | 24 |
| 90 | 35 | 34 | 33 | 32 | 31 | 30 | 29 | 29 | 28 | 27 | 27 | 26 | 25 | 25 | 24 |
| 92 | 35 | 34 | 33 | 32 | 32 | 31 | 30 | 29 | 28 | 28 | 27 | 26 | 26 | 25 | 25 |
| 94 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 30 | 29 | 28 | 28 | 27 | 26 | 26 | 25 |
| 96 | 36 | 35 | 34 | 34 | 33 | 32 | 31 | 30 | 29 | 29 | 28 | 27 | 27 | 26 | 26 |
| 98 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 31 | 30 | 29 | 29 | 28 | 27 | 27 | 26 |
| 100 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 30 | 30 | 29 | 28 | 28 | 27 | 27 |
| 102 | 38 | 37 | 36 | 35 | 34 | 33 | 33 | 32 | 31 | 30 | 30 | 29 | 28 | 28 | 27 |
| 104 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 31 | 31 | 30 | 29 | 29 | 28 | 27 |
| 106 | 39 | 38 | 37 | 36 | 35 | 34 | 34 | 33 | 32 | 31 | 30 | 30 | 29 | 29 | 28 |
| 108 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 32 | 32 | 31 | 30 | 30 | 29 | 28 |
| 110 | 40 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 | 32 | 31 | 31 | 30 | 29 | 29 |
| 112 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 33 | 33 | 32 | 31 | 31 | 30 | 29 |
| 114 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 | 32 | 32 | 31 | 30 | 30 |
| 116 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 34 | 33 | 32 | 31 | 31 | 30 |
| 118 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 36 | 35 | 34 | 33 | 33 | 32 | 31 | 31 |
| 120 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 34 | 34 | 33 | 32 | 32 | 31 |
| 122 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 36 | 35 | 34 | 33 | 33 | 32 | 31 |
| 124 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 | 32 | 32 |
| 126 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 37 | 36 | 35 | 34 | 34 | 33 | 32 |
| 128 | 45 | 43 | 42 | 41 | 40 | 40 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 | 33 |
| 130 | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 37 | 36 | 35 | 34 | 34 | 33 |
| 132 | | 44 | 43 | 42 | 41 | 40 | 40 | 39 | 38 | 37 | 36 | 35 | 35 | 34 | 33 |
| 134 | | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 37 | 36 | 35 | 34 | 34 |
| 136 | | | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 38 | 37 | 36 | 36 | 35 | 34 |
| 138 | | | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 38 | 37 | 37 | 36 | 35 | 35 |
| 140 | | | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 38 | 37 | 36 | 36 | 35 |
| 142 | | | | 44 | 43 | 42 | 42 | 41 | 40 | 39 | 38 | 38 | 37 | 36 | 35 |
| 144 | | | | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 38 | 37 | 36 | 36 |
| 146 | | | | | 44 | 43 | 42 | 42 | 41 | 40 | 39 | 38 | 38 | 37 | 36 |
| 148 | | | | | 45 | 44 | 43 | 42 | 41 | 40 | 39 | 39 | 38 | 37 | 37 |
| 150 | | | | | 45 | 44 | 43 | 42 | 41 | 41 | 40 | 39 | 38 | 38 | 37 |

## RADIUS OF CRITICAL CURVATURE AND VELOCITIES OF GRADIENT WINDS FOR FRICTIONLESS MOTION IN *HIGHS* AND *LOWS*.

### ENGLISH MEASURES.

$R_c$ = radius of critical curvature in miles. $V_c$ High = maximum speed in miles per hour on isobar of critical curvature. $V_s$ = speed along straight line isobars = 0.5 $V_c$. $V$ Low = speed in Low along isobar of curvature $R_c$. $V$ Low = 0.4142 $V_c$.

The table is computed for a density of the air, $\rho$ = .0010, which represents the conditions in the free air at an elevation of, roughly, one mile. Values for any other density can be readily found by dividing each or any of the tabulated values by the ratio of the densities, as, for example, for surface conditions divide by $1.2 = \frac{.0010}{.0012}$ and so on.

| Latitude: $\phi$ | | d (miles) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| 10° | $R_c$ | 8160 | 6530 | 5440 | 4660 | 4080 | 3260 | 2720 | 2040 | 1630 | 1360 | 1020 |
| | $V_c$ High | 372 | 298 | 248 | 212 | 186 | 149 | 124 | 93.0 | 74.4 | 62.0 | 46.5 |
| | $V_s$ | 186 | 149 | 124 | 106 | 93.0 | 74.4 | 62.0 | 46.5 | 37.2 | 31.0 | 23.2 |
| | $V$ Low | 154 | 123 | 103 | 88.0 | 77.0 | 61.6 | 51.3 | 38.5 | 30.8 | 25.7 | 19.2 |
| 20 | $R_c$ | 2100 | 1680 | 1400 | 1200 | 1050 | 841 | 701 | 526 | 420 | 350 | 263 |
| | $V_c$ High | 189 | 151 | 126 | 108 | 94.4 | 75.5 | 62.9 | 47.2 | 37.8 | 31.5 | 23.6 |
| | $V_s$ | 94.4 | 75.5 | 62.9 | 54.0 | 47.2 | 37.8 | 31.4 | 23.6 | 18.9 | 15.8 | 11.8 |
| | $V$ Low | 78.2 | 62.5 | 52.1 | 44.7 | 39.1 | 31.3 | 26.1 | 19.6 | 15.7 | 13.0 | 9.8 |
| 25 | $R_c$ | 1380 | 1100 | 918 | 787 | 688 | 551 | 459 | 344 | 275 | 230 | 172 |
| | $V_c$ High | 153 | 122 | 102 | 87.3 | 76.4 | 61.1 | 50.9 | 38.2 | 30.6 | 25.5 | 19.1 |
| | $V_s$ | 76.4 | 61.1 | 50.9 | 43.6 | 38.2 | 30.6 | 25.4 | 19.1 | 15.3 | 12.8 | 9.5 |
| | $V$ Low | 63.3 | 50.6 | 42.2 | 36.2 | 31.6 | 25.3 | 21.1 | 15.8 | 12.7 | 10.6 | 7.9 |
| 30 | $R_c$ | 984 | 787 | 656 | 562 | 492 | 393 | 328 | 246 | 197 | 164 | 123 |
| | $V_c$ High | 129 | 103 | 86.1 | 73.8 | 64.5 | 51.6 | 43.0 | 32.3 | 25.8 | 21.5 | 16.1 |
| | $V_s$ | 64.5 | 51.6 | 43.0 | 36.9 | 32.2 | 25.8 | 21.5 | 16.2 | 12.9 | 10.8 | 8.1 |
| | $V$ Low | 53.5 | 42.8 | 35.7 | 30.6 | 26.7 | 21.4 | 17.8 | 13.4 | 10.7 | 8.9 | 6.7 |
| 35 | $R_c$ | 747 | 598 | 498 | 427 | 374 | 299 | 249 | 187 | 150 | 125 | 93.4 |
| | $V_c$ High | 112 | 90.0 | 75.0 | 64.3 | 56.3 | 45.0 | 37.5 | 28.1 | 22.5 | 18.8 | 14.1 |
| | $V_s$ | 56.3 | 45.0 | 37.5 | 32.2 | 28.2 | 22.5 | 18.8 | 14.0 | 11.2 | 9.4 | 7.0 |
| | $V$ Low | 46.6 | 37.3 | 31.1 | 26.6 | 23.3 | 18.6 | 15.5 | 11.6 | 9.3 | 7.8 | 5.8 |
| 40 | $R_c$ | 595 | 476 | 397 | 340 | 298 | 238 | 198 | 149 | 119 | 99.2 | 74.4 |
| | $V_c$ High | 100 | 80.3 | 66.9 | 57.4 | 50.2 | 40.2 | 33.5 | 25.1 | 20.1 | 16.7 | 12.6 |
| | $V_s$ | 50.2 | 40.2 | 33.4 | 28.7 | 25.1 | 20.1 | 16.8 | 12.6 | 10.0 | 8.4 | 6.3 |
| | $V$ Low | 41.6 | 33.3 | 27.7 | 23.8 | 20.8 | 16.7 | 13.9 | 10.4 | 8.3 | 6.9 | 5.2 |
| 45 | $R_c$ | 492 | 393 | 328 | 281 | 246 | 197 | 164 | 123 | 98.4 | 82.0 | 61.5 |
| | $V_c$ High | 91.3 | 73.0 | 60.9 | 52.2 | 45.6 | 36.5 | 30.4 | 22.8 | 18.3 | 15.2 | 11.4 |
| | $V_s$ | 45.6 | 36.5 | 30.4 | 26.1 | 22.8 | 18.2 | 15.2 | 11.4 | 9.2 | 7.6 | 5.7 |
| | $V$ Low | 37.8 | 30.2 | 25.2 | 21.6 | 18.9 | 15.1 | 12.6 | 9.4 | 7.6 | 6.3 | 4.7 |
| 50 | $R_c$ | 419 | 335 | 279 | 240 | 210 | 168 | 140 | 105 | 83.8 | 69.9 | 52.4 |
| | $V_c$ High | 84.3 | 67.4 | 56.2 | 48.2 | 42.1 | 33.7 | 28.1 | 21.1 | 16.9 | 14.0 | 10.5 |
| | $V_s$ | 42.1 | 33.7 | 28.1 | 24.1 | 21.0 | 16.8 | 14.0 | 10.6 | 8.4 | 7.0 | 5.3 |
| | $V$ Low | 34.9 | 27.9 | 23.3 | 20.0 | 17.4 | 14.0 | 11.6 | 8.7 | 7.0 | 5.8 | 4.4 |
| 55 | $R_c$ | 366 | 293 | 244 | 209 | 183 | 147 | 122 | 91.6 | 73.3 | 61.1 | 45.8 |
| | $V_c$ High | 78.8 | 63.0 | 52.5 | 45.0 | 39.4 | 31.5 | 26.3 | 19.7 | 15.8 | 13.1 | 9.8 |
| | $V_s$ | 39.4 | 31.5 | 26.2 | 22.5 | 19.7 | 15.8 | 13.2 | 9.8 | 7.9 | 6.6 | 4.9 |
| | $V$ Low | 32.6 | 26.1 | 21.7 | 18.6 | 16.3 | 13.0 | 10.9 | 8.2 | 6.5 | 5.4 | 4.1 |
| 60 | $R_c$ | 328 | 262 | 219 | 187 | 164 | 131 | 109 | 82.0 | 65.6 | 54.7 | 41.0 |
| | $V_c$ High | 74.5 | 59.6 | 49.7 | 42.6 | 37.3 | 29.8 | 24.8 | 18.6 | 14.9 | 12.4 | 9.3 |
| | $V_s$ | 37.3 | 29.8 | 24.8 | 21.3 | 18.6 | 14.9 | 12.4 | 9.3 | 7.4 | 6.2 | 4.7 |
| | $V$ Low | 30.9 | 24.7 | 20.6 | 17.6 | 15.5 | 12.3 | 10.3 | 7.7 | 6.2 | 5.1 | 3.9 |
| 65 | $R_c$ | 299 | 240 | 200 | 171 | 150 | 120 | 99.8 | 74.8 | 59.9 | 49.9 | 37.4 |
| | $V_c$ High | 71.2 | 57.0 | 47.5 | 40.7 | 35.6 | 28.5 | 23.7 | 17.8 | 14.2 | 11.9 | 8.9 |
| | $V_s$ | 35.6 | 28.5 | 23.8 | 20.4 | 17.8 | 14.2 | 11.8 | 8.9 | 7.1 | 6.0 | 4.4 |
| | $V$ Low | 29.5 | 23.6 | 19.7 | 16.9 | 14.7 | 11.8 | 9.8 | 7.4 | 5.9 | 4.9 | 3.7 |

TABLE 42.

## RADIUS OF CRITICAL CURVATURE AND VELOCITIES OF GRADIENT WINDS FOR FRICTIONLESS MOTION IN *HIGHS* AND *LOWS*.

ENGLISH MEASURES.

| Latitude: $\phi$ | | d (miles) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| 70° | $R_c$ | 278 | 223 | 186 | 159 | 139 | 111 | 92.8 | 69.6 | 55.7 | 46.4 | 34.8 |
| | $V_c$ High | 68.7 | 55.0 | 45.8 | 39.3 | 34.3 | 27.5 | 22.9 | 17.2 | 13.7 | 11.4 | 8.6 |
| | $V_s$ | 34.3 | 27.5 | 22.9 | 19.6 | 17.2 | 13.8 | 11.4 | 8.6 | 6.8 | 5.7 | 4.3 |
| | $V$ Low | 28.5 | 22.8 | 19.0 | 16.3 | 14.2 | 11.4 | 9.5 | 7.1 | 5.7 | 4.7 | 3.6 |
| 75 | $R_c$ | 264 | 211 | 176 | 151 | 132 | 105 | 87.9 | 65.9 | 52.7 | 43.9 | 33.0 |
| | $V_c$ High | 66.8 | 53.5 | 44.6 | 38.2 | 33.4 | 26.7 | 22.3 | 16.7 | 13.4 | 11.1 | 8.4 |
| | $V_s$ | 33.4 | 26.8 | 22.3 | 19.1 | 16.7 | 13.4 | 11.2 | 8.4 | 6.7 | 5.6 | 4.2 |
| | $V$ Low | 27.7 | 22.2 | 18.5 | 15.8 | 13.8 | 11.1 | 9.2 | 6.9 | 5.6 | 4.6 | 3.5 |
| 80 | $R_c$ | 254 | 203 | 169 | 145 | 127 | 101 | 84.5 | 63.4 | 50.7 | 42.3 | 31.7 |
| | $V_c$ High | 65.5 | 52.4 | 43.7 | 37.5 | 32.8 | 26.2 | 21.8 | 16.4 | 13.1 | 10.9 | 8.2 |
| | $V_s$ | 32.8 | 26.2 | 21.8 | 18.8 | 16.4 | 13.1 | 10.9 | 8.2 | 6.6 | 5.4 | 4.1 |
| | $V$ Low | 27.1 | 21.7 | 18.1 | 15.5 | 13.6 | 10.9 | 9.0 | 6.8 | 5.4 | 4.5 | 3.4 |
| 85 | $R_c$ | 248 | 198 | 165 | 142 | 124 | 99.1 | 82.6 | 62.0 | 49.6 | 41.3 | 31.0 |
| | $V_c$ High | 64.8 | 51.8 | 43.2 | 37.0 | 32.4 | 25.9 | 21.6 | 16.2 | 13.0 | 10.8 | 8.1 |
| | $V_s$ | 32.4 | 25.9 | 21.6 | 18.5 | 16.2 | 13.0 | 10.8 | 8.1 | 6.5 | 5.4 | 4.0 |
| | $V$ Low | 26.8 | 21.5 | 17.9 | 15.3 | 13.4 | 10.7 | 8.9 | 6.7 | 5.4 | 4.5 | 3.4 |
| 90 | $R_c$ | 246 | 197 | 164 | 140 | 123 | 98.4 | 82.0 | 61.5 | 49.2 | 41.0 | 30.7 |
| | $V_c$ High | 64.6 | 51.6 | 43.0 | 36.9 | 32.3 | 25.8 | 21.5 | 16.1 | 12.9 | 10.8 | 8.1 |
| | $V_s$ | 32.3 | 25.8 | 21.5 | 18.4 | 16.2 | 12.9 | 10.8 | 8.0 | 6.4 | 5.4 | 4.0 |
| | $V$ Low | 26.8 | 21.4 | 17.8 | 15.3 | 13.4 | 10.7 | 8.9 | 6.7 | 5.3 | 4.5 | 3.3 |

TABLE 43.

## RADIUS OF CRITICAL CURVATURE AND VELOCITIES OF GRADIENT WINDS FOR FRICTIONLESS MOTION IN *HIGHS* AND *LOWS*.

METRIC MEASURES.

$R_c$ = radius of critical curvature in kilometers. $V_c$ High = maximum speed in meters per second on isobar of critical curvature. $V_s$ = speed along straight line isobars = 0.5 $V_c$. $V$ Low = speed in Low along isobar of curvature $R_c$. $V$ Low = 0.4142 $V_c$.

The remarks in heading of Table 42 relative to the density of the air apply equally to Table 43.

| Latitude: $\phi$ | | d (kilometers) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| 10° | $R_c$ | 8330 | 6660 | 5550 | 4760 | 4160 | 3330 | 2780 | 2080 | 1670 | 1390 | 1040 |
| | $V_c$ High | 105 | 84.3 | 70.2 | 60.2 | 52.7 | 42.1 | 35.1 | 26.3 | 21.1 | 17.6 | 13.2 |
| | $V_s$ | 52.7 | 42.2 | 35.1 | 30.1 | 26.4 | 21.0 | 17.6 | 13.2 | 10.6 | 8.8 | 6.6 |
| | $V$ Low | 43.5 | 34.9 | 29.1 | 24.9 | 21.8 | 17.4 | 14.5 | 10.9 | 8.7 | 7.3 | 5.5 |
| 20 | $R_c$ | 2140 | 1710 | 1430 | 1220 | 1070 | 857 | 714 | 536 | 429 | 357 | 268 |
| | $V_c$ High | 53.5 | 42.8 | 35.6 | 30.5 | 26.7 | 21.4 | 17.8 | 13.4 | 10.7 | 8.9 | 6.7 |
| | $V_s$ | 26.7 | 21.4 | 17.8 | 15.2 | 13.4 | 10.7 | 8.9 | 6.7 | 5.4 | 4.4 | 3.4 |
| | $V$ Low | 22.2 | 17.7 | 14.7 | 12.6 | 11.1 | 8.9 | 7.4 | 5.6 | 4.4 | 3.7 | 2.8 |
| 25 | $R_c$ | 1400 | 1120 | 936 | 802 | 702 | 562 | 468 | 351 | 281 | 234 | 175 |
| | $V_c$ High | 43.3 | 34.6 | 28.8 | 24.7 | 21.6 | 17.3 | 14.4 | 10.8 | 8.7 | 7.2 | 5.4 |
| | $V_s$ | 21.6 | 17.3 | 14.4 | 12.4 | 10.8 | 8.6 | 7.2 | 5.4 | 4.4 | 3.6 | 2.7 |
| | $V$ Low | 17.9 | 14.3 | 11.9 | 10.2 | 8.9 | 7.2 | 6.0 | 4.5 | 3.6 | 3.0 | 2.2 |
| 30 | $R_c$ | 1003 | 802 | 669 | 573 | 501 | 401 | 334 | 251 | 201 | 167 | 125 |
| | $V_c$ High | 36.6 | 29.3 | 24.4 | 20.9 | 18.3 | 14.6 | 12.2 | 9.1 | 7.3 | 6.1 | 4.6 |
| | $V_s$ | 18.3 | 14.6 | 12.2 | 10.4 | 9.2 | 7.3 | 6.1 | 4.6 | 3.6 | 3.0 | 2.3 |
| | $V$ Low | 15.2 | 12.1 | 10.1 | 8.7 | 7.6 | 6.0 | 5.1 | 3.8 | 3.0 | 2.5 | 1.9 |

## RADIUS OF CRITICAL CURVATURE AND VELOCITIES OF GRADIENT WINDS FOR FRICTIONLESS MOTION IN *HIGHS* AND *LOWS*.

METRIC MEASURES.

| Latitude: $\phi$ | | d (kilometers) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 125 | 150 | 175 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| 35° | $R_c$ | 762 | 610 | 508 | 435 | 381 | 305 | 254 | 191 | 152 | 127 | 95.3 |
| | $V_c$ High | 31.9 | 25.5 | 21.3 | 18.2 | 15.9 | 12.8 | 10.6 | 8.0 | 6.4 | 5.3 | 4.0 |
| | $V_s$ | 15.9 | 12.8 | 10.6 | 9.1 | 8.0 | 6.4 | 5.3 | 4.0 | 3.2 | 2.6 | 2.0 |
| | $V$ Low | 13.2 | 10.6 | 8.8 | 7.5 | 6.6 | 5.3 | 4.4 | 3.3 | 2.7 | 2.2 | 1.7 |
| 40 | $R_c$ | 607 | 485 | 405 | 347 | 303 | 243 | 202 | 152 | 121 | 101 | 75.8 |
| | $V_c$ High | 28.4 | 22.8 | 19.0 | 16.3 | 14.2 | 11.4 | 9.5 | 7.1 | 5.7 | 4.7 | 3.6 |
| | $V_s$ | 14.2 | 11.4 | 9.5 | 8.2 | 7.1 | 5.7 | 4.8 | 3.6 | 2.8 | 2.4 | 1.8 |
| | $V$ Low | 11.8 | 9.4 | 7.9 | 6.8 | 5.9 | 4.7 | 3.9 | 2.9 | 2.4 | 1.9 | 1.5 |
| 45 | $R_c$ | 501 | 401 | 334 | 287 | 251 | 201 | 167 | 125 | 100 | 83.6 | 62.7 |
| | $V_c$ High | 25.9 | 20.7 | 17.2 | 14.8 | 12.9 | 10.3 | 8.6 | 6.5 | 5.2 | 4.3 | 3.2 |
| | $V_s$ | 12.9 | 10.4 | 8.6 | 7.4 | 6.4 | 5.2 | 4.3 | 3.2 | 2.6 | 2.2 | 1.6 |
| | $V$ Low | 10.7 | 8.6 | 7.1 | 6.1 | 5.3 | 4.3 | 3.6 | 2.7 | 2.2 | 1.8 | 1.3 |
| 50 | $R_c$ | 427 | 342 | 285 | 244 | 214 | 171 | 142 | 107 | 85.5 | 71.2 | 53.4 |
| | $V_c$ High | 23.9 | 19.1 | 15.9 | 13.6 | 11.9 | 9.5 | 8.0 | 6.0 | 4.8 | 4.0 | 3.0 |
| | $V_s$ | 11.9 | 9.6 | 8.0 | 6.8 | 6.0 | 4.8 | 4.0 | 3.0 | 2.4 | 2.0 | 1.5 |
| | $V$ Low | 9.9 | 7.9 | 6.6 | 5.6 | 4.9 | 3.9 | 3.3 | 2.5 | 2.0 | 1.7 | 1.2 |
| 55 | $R_c$ | 374 | 299 | 249 | 213 | 187 | 149 | 125 | 93.4 | 74.7 | 62.3 | 46.7 |
| | $V_c$ High | 22.3 | 17.9 | 14.9 | 12.8 | 11.2 | 8.9 | 7.4 | 5.6 | 4.5 | 3.7 | 2.8 |
| | $V_s$ | 11.2 | 9.0 | 7.4 | 6.4 | 5.6 | 4.4 | 3.7 | 2.8 | 2.2 | 1.8 | 1.4 |
| | $V$ Low | 9.2 | 7.4 | 6.2 | 5.3 | 4.6 | 3.7 | 3.1 | 2.3 | 1.9 | 1.5 | 1.2 |
| 60 | $R_c$ | 334 | 267 | 223 | 191 | 167 | 134 | 111 | 83.6 | 66.9 | 55.7 | 41.8 |
| | $V_c$ High | 21.1 | 16.9 | 14.1 | 12.1 | 10.6 | 8.4 | 7.0 | 5.3 | 4.2 | 3.5 | 2.6 |
| | $V_s$ | 10.6 | 8.4 | 7.0 | 6.0 | 5.3 | 4.2 | 3.5 | 2.6 | 2.1 | 1.8 | 1.3 |
| | $V$ Low | 8.7 | 7.0 | 5.8 | 5.0 | 4.4 | 3.5 | 2.9 | 2.2 | 1.7 | 1.4 | 1.1 |
| 65 | $R_c$ | 305 | 244 | 204 | 174 | 153 | 122 | 102 | 76.3 | 61.0 | 50.9 | 38.2 |
| | $V_c$ High | 20.2 | 16.1 | 13.4 | 11.5 | 10.1 | 8.1 | 6.7 | 5.0 | 4.0 | 3.4 | 2.5 |
| | $V_s$ | 10.1 | 8.0 | 6.7 | 5.8 | 5.0 | 4.0 | 3.4 | 2.5 | 2.0 | 1.7 | 1.2 |
| | $V$ Low | 8.4 | 6.7 | 5.6 | 4.8 | 4.2 | 3.4 | 2.8 | 2.1 | 1.7 | 1.4 | 1.0 |
| 70 | $R_c$ | 284 | 227 | 189 | 162 | 142 | 114 | 94.6 | 71.0 | 56.8 | 47.3 | 35.5 |
| | $V_c$ High | 19.5 | 15.6 | 13.0 | 11.1 | 9.7 | 7.8 | 6.5 | 4.9 | 3.9 | 3.2 | 2.4 |
| | $V_s$ | 9.7 | 7.8 | 6.5 | 5.6 | 4.8 | 3.9 | 3.2 | 2.4 | 2.0 | 1.6 | 1.2 |
| | $V$ Low | 8.1 | 6.5 | 5.4 | 4.6 | 4.0 | 3.2 | 2.7 | 2.0 | 1.6 | 1.3 | 1.0 |
| 75 | $R_c$ | 269 | 215 | 179 | 154 | 134 | 107 | 89.6 | 67.2 | 53.7 | 44.8 | 33.6 |
| | $V_c$ High | 18.9 | 15.1 | 12.6 | 10.8 | 9.5 | 7.6 | 6.3 | 4.7 | 3.8 | 3.2 | 2.4 |
| | $V_s$ | 9.5 | 7.6 | 6.3 | 5.4 | 4.8 | 3.8 | 3.2 | 2.4 | 1.9 | 1.6 | 1.2 |
| | $V$ Low | 7.8 | 6.3 | 5.2 | 4.5 | 3.9 | 3.1 | 2.6 | 1.9 | 1.6 | 1.3 | 1.0 |
| 80 | $R_c$ | 259 | 207 | 172 | 148 | 129 | 103 | 86.2 | 64.6 | 51.7 | 43.1 | 32.3 |
| | $V_c$ High | 18.6 | 14.9 | 12.4 | 10.6 | 9.3 | 7.4 | 6.2 | 4.6 | 3.7 | 3.1 | 2.3 |
| | $V_s$ | 9.3 | 7.4 | 6.2 | 5.3 | 4.6 | 3.7 | 3.1 | 2.3 | 1.8 | 1.6 | 1.2 |
| | $V$ Low | 7.7 | 6.2 | 5.1 | 4.4 | 3.9 | 3.1 | 2.6 | 1.9 | 1.5 | 1.3 | 1.0 |
| 85 | $R_c$ | 253 | 202 | 168 | 144 | 126 | 101 | 84.2 | 63.2 | 50.5 | 42.1 | 31.6 |
| | $V_c$ High | 18.4 | 14.7 | 12.2 | 10.5 | 9.2 | 7.3 | 6.1 | 4.6 | 3.7 | 3.1 | 2.3 |
| | $V_s$ | 9.2 | 7.4 | 6.1 | 5.2 | 4.6 | 3.6 | 3.0 | 2.3 | 1.8 | 1.6 | 1.2 |
| | $V$ Low | 7.6 | 6.1 | 5.1 | 4.3 | 3.8 | 3.0 | 2.5 | 1.9 | 1.5 | 1.3 | 1.0 |
| 90 | $R_c$ | 251 | 201 | 167 | 143 | 125 | 100 | 83.6 | 62.7 | 50.1 | 41.8 | 31.3 |
| | $V_c$ High | 18.3 | 14.6 | 12.2 | 10.4 | 9.1 | 7.3 | 6.1 | 4.6 | 3.7 | 3.0 | 2.3 |
| | $V_s$ | 9.1 | 7.3 | 6.1 | 5.2 | 4.6 | 3.6 | 3.0 | 2.3 | 1.8 | 1.5 | 1.2 |
| | $V$ Low | 7.6 | 6.0 | 5.1 | 4.3 | 3.8 | 3.0 | 2.5 | 1.9 | 1.5 | 1.2 | 1.0 |

## REDUCTION OF TEMPERATURE TO SEA LEVEL.

English measures . . . . . . . . . . . . . . . . Table 44
Metric measures . . . . . . . . . . . . . . . . Table 45

## REDUCTION OF TEMPERATURE TO SEA LEVEL.

### ENGLISH MEASURES.

| Rate of decrease of temperature. 1°F. for every | DIFFERENCES BETWEEN THE TEMPERATURE AT ANY ALTITUDE AND AT SEA LEVEL. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALTITUDE IN FEET. | | | | | | | | | | | | | |
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 2000 | 3000 | 4000 | 5000 |
| Feet. | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. | F. |
| 200 | 0°.50 | 1°.00 | 1°.50 | 2°.00 | 2°.50 | 3°.00 | 3°.50 | 4°.00 | 4°.50 | 5°.00 | 10°.00 | 15°.00 | 20°.00 | 25°.00 |
| 205 | 0.49 | 0.98 | 1.46 | 1.95 | 2.44 | 2.93 | 3.41 | 3.90 | 4.39 | 4.88 | 9.76 | 14.63 | 19.51 | 24.39 |
| 210 | 0.48 | 0.95 | 1.43 | 1.90 | 2.38 | 2.86 | 3.33 | 3.81 | 4.29 | 4.76 | 9.52 | 14.29 | 19.05 | 23.81 |
| 215 | 0.47 | 0.93 | 1.40 | 1.86 | 2.33 | 2.79 | 3.26 | 3.72 | 4.19 | 4.65 | 9.30 | 13.95 | 18.60 | 23.26 |
| 220 | 0.45 | 0.91 | 1.36 | 1.82 | 2.27 | 2.73 | 3.18 | 3.64 | 4.09 | 4.55 | 9.09 | 13.63 | 18.18 | 22.72 |
| 230 | 0.43 | 0.87 | 1.30 | 1.74 | 2.17 | 2.61 | 3.04 | 3.48 | 3.91 | 4.35 | 8.70 | 13.04 | 17.39 | 21.74 |
| 240 | 0.42 | 0.83 | 1.25 | 1.67 | 2.08 | 2.50 | 2.92 | 3.33 | 3.75 | 4.17 | 8.33 | 12.50 | 16.67 | 20.83 |
| 250 | 0.40 | 0.80 | 1.20 | 1.60 | 2.00 | 2.40 | 2.80 | 3.20 | 3.60 | 4.00 | 8.00 | 12.00 | 16.00 | 20.00 |
| 260 | 0.38 | 0.77 | 1.15 | 1.54 | 1.92 | 2.31 | 2.69 | 3.08 | 3.46 | 3.85 | 7.69 | 11.54 | 15.38 | 19.23 |
| 270 | 0.37 | 0.74 | 1.11 | 1.48 | 1.85 | 2.22 | 2.59 | 2.96 | 3.33 | 3.70 | 7.41 | 11.11 | 14.81 | 18.52 |
| 280 | 0.36 | 0.71 | 1.07 | 1.43 | 1.79 | 2.14 | 2.50 | 2.86 | 3.21 | 3.57 | 7.14 | 10.71 | 14.29 | 17.86 |
| 290 | 0.34 | 0.69 | 1.03 | 1.38 | 1.73 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 6.90 | 10.34 | 13.79 | 17.24 |
| 300 | 0.33 | 0.67 | 1.00 | 1.33 | 1.67 | 2.00 | 2.33 | 2.67 | 3.00 | 3.33 | 6.67 | 10.00 | 13.33 | 16.67 |
| 310 | 0.32 | 0.65 | 0.97 | 1.29 | 1.61 | 1.94 | 2.26 | 2.58 | 2.90 | 3.23 | 6.45 | 9.68 | 12.90 | 16.13 |
| 320 | 0.31 | 0.62 | 0.94 | 1.25 | 1.56 | 1.87 | 2.19 | 2.50 | 2.81 | 3.12 | 6.25 | 9.37 | 12.50 | 15.62 |
| 340 | 0.29 | 0.59 | 0.88 | 1.18 | 1.47 | 1.76 | 2.06 | 2.35 | 2.65 | 2.94 | 5.88 | 8.82 | 11.76 | 14.71 |
| 360 | 0.28 | 0.56 | 0.83 | 1.11 | 1.39 | 1.67 | 1.94 | 2.22 | 2.50 | 2.78 | 5.56 | 8.33 | 11.11 | 13.89 |
| 380 | 0.26 | 0.53 | 0.79 | 1.05 | 1.32 | 1.58 | 1.84 | 2.10 | 2.37 | 2.63 | 5.26 | 7.89 | 10.53 | 13.16 |
| 400 | 0.25 | 0.50 | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 5.00 | 7.50 | 10.00 | 12.50 |
| 420 | 0.24 | 0.48 | 0.71 | 0.95 | 1.19 | 1.43 | 1.67 | 1.90 | 2.14 | 2.38 | 4.76 | 7.14 | 9.52 | 11.90 |
| 440 | 0.23 | 0.45 | 0.68 | 0.91 | 1.14 | 1.36 | 1.59 | 1.82 | 2.05 | 2.27 | 4.55 | 6.82 | 9.09 | 11.36 |
| 460 | 0.22 | 0.43 | 0.65 | 0.87 | 1.09 | 1.30 | 1.52 | 1.74 | 1.96 | 2.17 | 4.35 | 6.52 | 8.70 | 10.87 |
| 480 | 0.21 | 0.42 | 0.62 | 0.83 | 1.04 | 1.25 | 1.46 | 1.67 | 1.87 | 2.08 | 4.17 | 6.25 | 8.33 | 10.42 |
| 500 | 0.20 | 0.40 | 0.60 | 0.80 | 1.00 | 1.20 | 1.40 | 1.60 | 1.80 | 2.00 | 4.00 | 6.00 | 8.00 | 10.00 |
| 520 | 0.19 | 0.38 | 0.58 | 0.77 | 0.96 | 1.15 | 1.35 | 1.54 | 1.73 | 1.92 | 3.85 | 5.77 | 7.69 | 9.62 |
| 540 | 0.19 | 0.37 | 0.56 | 0.74 | 0.93 | 1.11 | 1.30 | 1.48 | 1.67 | 1.85 | 3.70 | 5.56 | 7.41 | 9.26 |
| 560 | 0.18 | 0.36 | 0.54 | 0.71 | 0.89 | 1.07 | 1.25 | 1.43 | 1.61 | 1.79 | 3.57 | 5.36 | 7.14 | 8.93 |
| 580 | 0.17 | 0.34 | 0.52 | 0.69 | 0.86 | 1.03 | 1.21 | 1.38 | 1.55 | 1.72 | 3.45 | 5.17 | 6.90 | 8.62 |
| 600 | 0.17 | 0.33 | 0.50 | 0.67 | 0.83 | 1.00 | 1.17 | 1.33 | 1.50 | 1.67 | 3.33 | 5.00 | 6.67 | 8.33 |
| 620 | 0.16 | 0.32 | 0.48 | 0.65 | 0.81 | 0.97 | 1.13 | 1.29 | 1.45 | 1.61 | 3.23 | 4.84 | 6.45 | 8.06 |
| 650 | 0.15 | 0.31 | 0.46 | 0.62 | 0.77 | 0.92 | 1.08 | 1.23 | 1.38 | 1.54 | 3.08 | 4.62 | 6.15 | 7.69 |
| 700 | 0.14 | 0.29 | 0.43 | 0.57 | 0.71 | 0.86 | 1.00 | 1.14 | 1.29 | 1.43 | 2.86 | 4.29 | 5.71 | 7.14 |
| 750 | 0.13 | 0.27 | 0.40 | 0.53 | 0.67 | 0.80 | 0.93 | 1.07 | 1.20 | 1.33 | 2.67 | 4.00 | 5.33 | 6.67 |
| 800 | 0.12 | 0.25 | 0.37 | 0.50 | 0.62 | 0.75 | 0.87 | 1.00 | 1.12 | 1.25 | 2.50 | 3.75 | 5.00 | 6.25 |
| 850 | 0.12 | 0.24 | 0.35 | 0.47 | 0.59 | 0.71 | 0.82 | 0.94 | 1.06 | 1.18 | 2.35 | 3.53 | 4.71 | 5.88 |
| 900 | 0.11 | 0.22 | 0.33 | 0.44 | 0.56 | 0.67 | 0.78 | .0.89 | 1.00 | 1.11 | 2.22 | 3.33 | 4.44 | 5.56 |

Tabular values are to be added to the observed temperature to obtain the temperature at sea level.

# REDUCTION OF TEMPERATURE TO SEA LEVEL.

## METRIC MEASURES.

| Rate of decrease of temperature. 1°C. for every | DIFFERENCES BETWEEN THE TEMPERATURE AT ANY ALTITUDE AND AT SEA LEVEL. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ALTITUDE IN METERS. | | | | | | | | | | | |
| | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 2000 | 3000 |
| m. | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. | C. |
| 100 | 1°.00 | 2°.00 | 3°.00 | 4°.00 | 5°.00 | 6°.00 | 7°.00 | 8°.00 | 9°.00 | 10°.00 | 20°.00 | 30°.00 |
| 102 | 0.98 | 1.96 | 2.94 | 3.92 | 4.90 | 5.88 | 6.86 | 7.84 | 8.82 | 9.80 | 19.61 | 29.41 |
| 104 | 0.96 | 1.92 | 2.88 | 3.85 | 4.81 | 5.77 | 6.73 | 7.69 | 8.65 | 9.62 | 19.23 | 28.85 |
| 106 | 0.94 | 1.89 | 2.83 | 3.77 | 4.72 | 5.66 | 6.60 | 7.55 | 8.49 | 9.43 | 18.87 | 28.30 |
| 108 | 0.93 | 1.85 | 2.78 | 3.70 | 4.63 | 5.56 | 6.48 | 7.41 | 8.33 | 9.26 | 18.52 | 27.78 |
| 110 | 0.91 | 1.82 | 2.73 | 3.64 | 4.55 | 5.45 | 6.36 | 7.27 | 8.18 | 9.09 | 18.18 | 27.27 |
| 115 | 0.87 | 1.74 | 2.61 | 3.48 | 4.35 | 5.22 | 6.09 | 6.96 | 7.83 | 8.70 | 17.39 | 26.09 |
| 120 | 0.83 | 1.67 | 2.50 | 3.33 | 4.17 | 5.00 | 5.83 | 6.67 | 7.50 | 8.33 | 16.67 | 25.00 |
| 125 | 0.80 | 1.60 | 2.40 | 3.20 | 4.00 | 4.80 | 5.60 | 6.40 | 7.20 | 8.00 | 16.00 | 24.00 |
| 130 | 0.77 | 1.54 | 2.31 | 3.08 | 3.85 | 4.62 | 5.38 | 6.15 | 6.92 | 7.69 | 15.38 | 23.08 |
| 135 | 0.74 | 1.48 | 2.22 | 2.96 | 3.70 | 4.44 | 5.19 | 5.93 | 6.66 | 7.41 | 14.81 | 22.22 |
| 140 | 0.71 | 1.43 | 2.14 | 2.86 | 3.57 | 4.29 | 5.00 | 5.71 | 6.43 | 7.14 | 14.29 | 21.43 |
| 145 | 0.69 | 1.38 | 2.07 | 2.76 | 3.45 | 4.14 | 4.83 | 5.52 | 6.21 | 6.90 | 13.79 | 20.69 |
| 150 | 0.67 | 1.33 | 2.00 | 2.67 | 3.33 | 4.00 | 4.67 | 5.33 | 6.00 | 6.67 | 13.33 | 20.00 |
| 155 | 0.65 | 1.29 | 1.94 | 2.58 | 3.23 | 3.87 | 4.52 | 5.16 | 5.81 | 6.45 | 12.90 | 19.35 |
| 160 | 0.62 | 1.25 | 1.87 | 2.50 | 3.12 | 3.75 | 4.37 | 5.00 | 5.62 | 6.25 | 12.50 | 18.75 |
| 170 | 0.59 | 1.18 | 1.76 | 2.35 | 2.94 | 3.53 | 4.12 | 4.70 | 5.29 | 5.88 | 11.76 | 17.65 |
| 180 | 0.56 | 1.11 | 1.67 | 2.22 | 2.78 | 3.33 | 3.89 | 4.44 | 5.00 | 5.56 | 11.11 | 16.67 |
| 190 | 0.53 | 1.05 | 1.58 | 2.10 | 2.63 | 3.16 | 3.68 | 4.21 | 4.74 | 5.26 | 10.53 | 15.79 |
| 200 | 0.50 | 1.00 | 1.50 | 2.00 | 2.50 | 3.00 | 3.50 | 4.00 | 4.50 | 5.00 | 10.00 | 15.00 |
| 210 | 0.48 | 0.95 | 1.43 | 1.90 | 2.38 | 2.86 | 3.33 | 3.81 | 4.29 | 4.76 | 9.52 | 14.29 |
| 220 | 0.45 | 0.91 | 1.36 | 1.82 | 2.27 | 2.73 | 3.18 | 3.64 | 4.09 | 4.55 | 9.09 | 13.64 |
| 230 | 0.43 | 0.87 | 1.30 | 1.74 | 2.17 | 2.61 | 3.04 | 3.48 | 3.91 | 4.35 | 8.70 | 13.04 |
| 240 | 0.42 | 0.83 | 1.25 | 1.67 | 2.08 | 2.50 | 2.92 | 3.33 | 3.75 | 4.17 | 8.33 | 12.50 |
| 250 | 0.40 | 0.80 | 1.20 | 1.60 | 2.00 | 2.40 | 2.80 | 3.20 | 3.60 | 4.00 | 8.00 | 12.00 |
| 260 | 0.38 | 0.77 | 1.15 | 1.54 | 1.92 | 2.31 | 2.69 | 3.08 | 3.46 | 3.85 | 7.69 | 11.54 |
| 270 | 0.37 | 0.74 | 1.11 | 1.48 | 1.85 | 2.22 | 2.59 | 2.96 | 3.33 | 3.70 | 7.41 | 11.11 |
| 280 | 0.36 | 0.71 | 1.07 | 1.43 | 1.79 | 2.14 | 2.50 | 2.86 | 3.21 | 3.57 | 7.14 | 10.71 |
| 290 | 0.34 | 0.69 | 1.03 | 1.38 | 1.72 | 2.07 | 2.41 | 2.76 | 3.10 | 3.45 | 6.90 | 10.34 |
| 300 | 0.33 | 0.67 | 1.00 | 1.33 | 1.67 | 2.00 | 2.33 | 2.67 | 3.00 | 3.33 | 6.67 | 10.00 |
| 320 | 0.31 | 0.62 | 0.94 | 1.25 | 1.56 | 1.87 | 2.19 | 2.50 | 2.81 | 3.12 | 6 25 | 9.37 |
| 340 | 0.29 | 0.59 | 0.88 | 1.18 | 1.47 | 1.76 | 2.06 | 2.35 | 2.65 | 2.94 | 5.88 | 8.82 |
| 360 | 0.28 | 0.56 | 0.83 | 1.11 | 1.39 | 1.67 | 1.94 | 2.22 | 2.50 | 2.78 | 5.56 | 8.33 |
| 380 | 0.26 | 0.53 | 0.79 | 1.05 | 1.32 | 1.58 | 1.84 | 2.10 | 2.37 | 2.63 | 5.26 | 7.89 |
| 400 | 0.25 | 0.50 | 0.75 | 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 5.00 | 7.50 |
| 420 | 0.24 | 0.48 | 0.71 | 0.95 | 1.19 | 1.43 | 1.67 | 1.90 | 2.14 | 2.38 | 4.76 | 7.14 |
| 440 | 0.23 | 0.45 | 0.68 | 0.91 | 1.14 | 1.36 | 1.59 | 1.82 | 2.05 | 2.27 | 4.55 | 6.82 |
| 460 | 0.22 | 0.43 | 0.65 | 0.87 | 1.09 | 1.30 | 1.52 | 1.74 | 1.96 | 2.17 | 4.35 | 6.52 |
| 480 | 0.21 | 0.42 | 0.62 | 0.83 | 1.04 | 1.25 | 1.46 | 1.67 | 1.87 | 2.08 | 4.17 | 6.25 |
| 500 | 0.20 | 0.40 | 0.60 | 0.80 | 1.00 | 1.20 | 1.40 | 1.60 | 1.80 | 2.00 | 4.00 | 6.00 |

Tabular values are to be added to the observed temperature to obtain the temperature at sea level.

# BAROMETRICAL TABLES.


Reduction of the barometer to standard temperature —

English measures . . . . . . . . . . . . . . TABLE 46

Metric measures . . . . . . . . . . . . . . TABLE 47

Reduction of the mercurial barometer to standard gravity.

Direct reduction from local to standard gravity . . . . TABLE 48

Reduction through variation with latitude —

English measures . . . . . . . . . . . . . . TABLE 49

Metric measures . . . . . . . . . . . . . . TABLE 50

Determination of heights by the barometer. English measures.

Values of $60368\,(1 + 0.0010195 \times 36)\, log\, \frac{29.90}{B}$ . . . . TABLE 51

Term for temperature . . . . . . . . . . . . . . TABLE 52

Correction for gravity and weight of mercury . . . . . TABLE 53

Correction for average degree of humidity . . . . . . TABLE 54

Correction for the variation of gravity with altitude . . TABLE 55

Determination of heights by the barometer — Metric and dynamic measures.

Values of $18400\, log\, \frac{760}{B}$ . . . . . . . . . . . . . TABLE 56

Values for $18400\, log\, \frac{1013.3}{B}$ . . . . . . . . . . . . TABLE 57

Temperature correction factor . . . . . . . . . . . TABLE 58

Temperature correction $(0.003670\theta \times Z)$ . . . . . . . . TABLE 59

Correction for humidity . . . . . . . . . . . . . TABLE 60

Correction for humidity. Auxiliary to Table 58 . . . . TABLE 61

Correction for gravity and weight of mercury . . . . . TABLE 62

Correction for the variation of gravity with altitude . . TABLE 63

Difference of height corresponding to a change of 0.1 inch in the barometer — English measures . . . . . . . . TABLE 64

Difference of height corresponding to a change of 1 millimeter in the barometer — Metric measures . . . . . . TABLE 65

Determination of heights by the barometer.

Formula of Babinet . . . . . . . . . . . . . . TABLE 66

Barometric pressures corresponding to the temperature of the boiling point of water —

English measures . . . . . . . . . . . . . . TABLE 67

Metric measures . . . . . . . . . . . . . . TABLE 68

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 19.0 | 19.5 | 20.0 | 20.5 | 21.0 | 21.5 | 22.0 | 22.5 | 23.0 | 23.5 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 0°.0 | +0.050 | +0.051 | +0.052 | +0.053 | +0.055 | +0.056 | +0.057 | +0.059 | +0.060 | +0.061 |
| +0.5 | +0.049 | +0.050 | +0.051 | +0.053 | +0.054 | +0.055 | +0.056 | +0.058 | +0.059 | +0.060 |
| 1.0 | .048 | .049 | .050 | .052 | .053 | .054 | .055 | .057 | .058 | .059 |
| 1.5 | .047 | .048 | .049 | .051 | .052 | .053 | .054 | .056 | .057 | .058 |
| 2.0 | .046 | .047 | .049 | .050 | .051 | .052 | .053 | .055 | .056 | .057 |
| 2.5 | .045 | .046 | .048 | .049 | .050 | .051 | .052 | .054 | .055 | .056 |
| 3.0 | +0.044 | +0.046 | +0.047 | +0.048 | +0.049 | +0.050 | +0.051 | +0.053 | +0.054 | +0.055 |
| 3.5 | .043 | .045 | .046 | .047 | .048 | .049 | .050 | .051 | .053 | .054 |
| 4.0 | .043 | .044 | .045 | .046 | .047 | .048 | .049 | .050 | .052 | .053 |
| 4.5 | .042 | .043 | .044 | .045 | .046 | .047 | .048 | .049 | .051 | .052 |
| 5.0 | .041 | .042 | .043 | .044 | .045 | .046 | .047 | .048 | .049 | .051 |
| 5.5 | +0.040 | +0.041 | +0.042 | +0.043 | +0.044 | +0.045 | +0.046 | +0.047 | +0.048 | +0.049 |
| 6.0 | .039 | .040 | .041 | .042 | .043 | .044 | .045 | .046 | .047 | .048 |
| 6.5 | .038 | .039 | .040 | .041 | .042 | .043 | .044 | .045 | .046 | .047 |
| 7.0 | .037 | .038 | .039 | .040 | .041 | .042 | .043 | .044 | .045 | .046 |
| 7.5 | .037 | .038 | .038 | .039 | .040 | .041 | .042 | .043 | .044 | .045 |
| 8.0 | +0.036 | +0.037 | +0.038 | +0.038 | +0.039 | +0.040 | +0.041 | +0.042 | +0.043 | +0.044 |
| 8.5 | .035 | .036 | .037 | .038 | .038 | .039 | .040 | .041 | .042 | .043 |
| 9.0 | .034 | .035 | .036 | .037 | .038 | .038 | .039 | .040 | .041 | .042 |
| 9.5 | .033 | .034 | .035 | .036 | .037 | .037 | .038 | .039 | .040 | .041 |
| 10.0 | .032 | .033 | .034 | .035 | .036 | .036 | .037 | .038 | .039 | .040 |
| 10.5 | +0.031 | +0.032 | +0.033 | +0.034 | +0.035 | +0.035 | +0.036 | +0.037 | +0.038 | +0.039 |
| 11.0 | .030 | .031 | .032 | .033 | .034 | .034 | .035 | .036 | .037 | .038 |
| 11.5 | .030 | .030 | .031 | .032 | .033 | .034 | .034 | .035 | .036 | .037 |
| 12.0 | .029 | .030 | .030 | .031 | .032 | .033 | .033 | .034 | .035 | .036 |
| 12.5 | .028 | .029 | .029 | .030 | .031 | .032 | .032 | .033 | .034 | .034 |
| 13.0 | +0.027 | +0.028 | +0.028 | +0.029 | +0.030 | +0.031 | +0.031 | +0.032 | +0.033 | +0.033 |
| 13.5 | .026 | .027 | .028 | .028 | .029 | .030 | .030 | .031 | .032 | .032 |
| 14.0 | .025 | .026 | .027 | .027 | .028 | .029 | .029 | .030 | .031 | .031 |
| 14.5 | .024 | .025 | .026 | .026 | .027 | .028 | .028 | .029 | .030 | .030 |
| 15.0 | .024 | .024 | .025 | .025 | .026 | .027 | .027 | .028 | .029 | .029 |
| 15.5 | +0.023 | +0.023 | +0.024 | +0.024 | +0.025 | +0.026 | +0.026 | +0.027 | +0.027 | +0.028 |
| 16.0 | .022 | .023 | .023 | .024 | .024 | .025 | .025 | .026 | .026 | .027 |
| 16.5 | .021 | .022 | .022 | .023 | .023 | .024 | .024 | .025 | .025 | .026 |
| 17.0 | .020 | .021 | .021 | .022 | .022 | .023 | .023 | .024 | .024 | .025 |
| 17.5 | .019 | .020 | .020 | .021 | .021 | .022 | .022 | .023 | .023 | .024 |
| 18.0 | +0.018 | +0.019 | +0.019 | +0.020 | +0.020 | +0.021 | +0.021 | +0.022 | +0.022 | +0.023 |
| 18.5 | .017 | .018 | .018 | .019 | .019 | .020 | .020 | .021 | .021 | .022 |
| 19.0 | .017 | .017 | .018 | .018 | .018 | .019 | .019 | .020 | .020 | .021 |
| 19.5 | .016 | .016 | .017 | .017 | .017 | .018 | .018 | .019 | .019 | .020 |
| 20.0 | .015 | .015 | .016 | .016 | .016 | .017 | .017 | .018 | .018 | .018 |
| 20.5 | +0.014 | +0.014 | +0.015 | +0.015 | +0.016 | +0.016 | +0.016 | +0.017 | +0.017 | +0.017 |
| 21.0 | .013 | .014 | .014 | .014 | .015 | .015 | .015 | .016 | .016 | .016 |
| 21.5 | .012 | .013 | .013 | .013 | .014 | .014 | .014 | .015 | .015 | .015 |
| 22.0 | .011 | .012 | .012 | .012 | .013 | .013 | .013 | .014 | .014 | .014 |
| 22.5 | .011 | .011 | .011 | .011 | .012 | .012 | .012 | .013 | .013 | .013 |
| 23.0 | +0.010 | +0.010 | +0.010 | +0.010 | +0.011 | +0.011 | +0.011 | +0.012 | +0.012 | +0.012 |
| 23.5 | .009 | .009 | .009 | .010 | .010 | .010 | .010 | .011 | .011 | .011 |
| 24.0 | .008 | .008 | .008 | .009 | .009 | .009 | .009 | .010 | .010 | .010 |
| 24.5 | .007 | .007 | .008 | .008 | .008 | .008 | .008 | .009 | .009 | .009 |
| 25.0 | .006 | .006 | .007 | .007 | .007 | .007 | .007 | .008 | .008 | .008 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 19.0 | 19.5 | 20.0 | 20.5 | 21.0 | 21.5 | 22.0 | 22.5 | 23.0 | 23.5 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 25°.5 | +0.005 | +0.006 | +0.006 | +0.006 | +0.006 | +0.006 | +0.006 | +0.006 | +0.007 | +0.007 |
| 26.0 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .006 |
| 26.5 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .005 |
| 27.0 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 27.5 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| 28.0 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 |
| 28.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29.0 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |
| 29.5 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| 30.0 | .002 | .002 | .002 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 30.5 | −0.003 | −0.003 | −0.003 | −0.003 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 |
| 31.0 | .004 | .004 | .004 | .004 | .005 | .005 | .005 | .005 | .005 | .005 |
| 31.5 | .005 | .005 | .005 | .005 | .005 | .006 | .006 | .006 | .006 | .006 |
| 32.0 | .006 | .006 | .006 | .006 | .006 | .007 | .007 | .007 | .007 | .007 |
| 32.5 | .007 | .007 | .007 | .007 | .007 | .008 | .008 | .008 | .008 | .008 |
| 33.0 | −0.008 | −0.008 | −0.008 | −0.008 | −0.008 | −0.009 | −0.009 | −0.009 | −0.009 | −0.009 |
| 33.5 | .008 | .009 | .009 | .009 | .009 | .010 | .010 | .010 | .010 | .010 |
| 34.0 | .009 | .010 | .010 | .010 | .010 | .010 | .011 | .011 | .011 | .011 |
| 34.5 | .010 | .010 | .011 | .011 | .011 | .011 | .012 | .012 | .012 | .013 |
| 35.0 | .011 | .011 | .012 | .012 | .012 | .012 | .013 | .013 | .013 | .014 |
| 35.5 | −0.012 | −0.012 | −0.012 | −0.013 | −0.013 | −0.013 | −0.014 | −0.014 | −0.014 | −0.015 |
| 36.0 | .013 | .013 | .013 | .014 | .014 | .014 | .015 | .015 | .015 | .016 |
| 36.5 | .014 | .014 | .014 | .015 | .015 | .015 | .016 | .016 | .016 | .017 |
| 37.0 | .014 | .015 | .015 | .016 | .016 | .016 | .017 | .017 | .017 | .018 |
| 37.5 | .015 | .016 | .016 | .017 | .017 | .017 | .018 | .018 | .019 | .019 |
| 38.0 | −0.016 | −0.017 | −0.017 | −0.017 | −0.018 | −0.018 | −0.019 | −0.019 | −0.020 | −0.020 |
| 38.5 | .017 | .017 | .018 | .018 | .019 | .019 | .020 | .020 | .021 | .021 |
| 39.0 | .018 | .018 | .019 | .019 | .020 | .020 | .021 | .021 | .022 | .022 |
| 39.5 | .019 | .019 | .020 | .020 | .021 | .021 | .022 | .022 | .023 | .023 |
| 40.0 | .020 | .020 | .021 | .021 | .022 | .022 | .023 | .023 | .024 | .024 |
| 40.5 | −0.020 | −0.021 | −0.022 | −0.022 | −0.023 | −0.023 | −0.024 | −0.024 | −0.025 | −0.025 |
| 41.0 | .021 | .022 | .022 | .023 | .024 | .024 | .025 | .025 | .026 | .026 |
| 41.5 | .022 | .023 | .023 | .024 | .025 | .025 | .026 | .026 | .027 | .027 |
| 42.0 | .023 | .024 | .024 | .025 | .025 | .026 | .027 | .027 | .028 | .029 |
| 42.5 | .024 | .025 | .025 | .026 | .026 | .027 | .028 | .028 | .029 | .030 |
| 43.0 | −0.025 | −0.025 | −0.026 | −0.027 | −0.027 | −0.028 | −0.029 | −0.029 | −0.030 | −0.031 |
| 43.5 | .026 | .026 | .027 | .028 | .028 | .029 | .030 | .030 | .031 | .032 |
| 44.0 | .026 | .027 | .028 | .029 | .029 | .030 | .031 | .031 | .032 | .033 |
| 44.5 | .027 | .028 | .029 | .030 | .030 | .031 | .032 | .032 | .033 | .034 |
| 45.0 | .028 | .029 | .030 | .030 | .031 | .032 | .033 | .033 | .034 | .035 |
| 45.5 | −0.029 | −0.030 | −0.031 | −0.031 | −0.032 | −0.033 | −0.034 | −0.034 | −0.035 | −0.036 |
| 46.0 | .030 | .031 | .031 | .032 | .033 | .034 | .035 | .035 | .036 | .037 |
| 46.5 | .031 | .032 | .032 | .033 | .034 | .035 | .036 | .036 | .037 | .038 |
| 47.0 | .032 | .032 | .033 | .034 | .035 | .036 | .037 | .037 | .038 | .039 |
| 47.5 | .033 | .033 | .034 | .035 | .036 | .037 | .038 | .038 | .039 | .040 |
| 48.0 | −0.033 | −0.034 | −0.035 | −0.036 | −0.037 | −0.038 | −0.039 | −0.040 | −0.040 | −0.041 |
| 48.5 | .034 | .035 | .036 | .037 | .038 | .039 | .040 | .041 | .041 | .042 |
| 49.0 | .035 | .036 | .037 | .038 | .039 | .040 | .041 | .042 | .042 | .043 |
| 49.5 | .036 | .037 | .038 | .039 | .040 | .041 | .042 | .043 | .044 | .044 |
| 50.0 | .037 | .038 | .039 | .040 | .041 | .042 | .043 | .044 | 0.45 | .046 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 19.0 | 19.5 | 20.0 | 20.5 | 21.0 | 21.5 | 22.0 | 22.5 | 23.0 | 23.5 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 50°.5 | −0.038 | −0.039 | −0.040 | −0.041 | −0.042 | −0.043 | −0.044 | −0.045 | −0.046 | −0.047 |
| 51.0 | .039 | .040 | .041 | .042 | .043 | .044 | .045 | .046 | 0.47 | .048 |
| 51.5 | .039 | .040 | .041 | .042 | .044 | .045 | .046 | .047 | .048 | .049 |
| 52.0 | .040 | .041 | .042 | .043 | .044 | .046 | .047 | .048 | .049 | .050 |
| 52.5 | .041 | .042 | .043 | .044 | .045 | .047 | .048 | .049 | .050 | .051 |
| 53.0 | −0.042 | −0.043 | −0.044 | −0.045 | −0.046 | −0.047 | −0.049 | −0.050 | −0.051 | −0.052 |
| 53.5 | .043 | .044 | .045 | .046 | .047 | .048 | .050 | .051 | .052 | .053 |
| 54.0 | .044 | .045 | .046 | .047 | .048 | .049 | .051 | .052 | .053 | .054 |
| 54.5 | .045 | .046 | .047 | .048 | .049 | .050 | .052 | .053 | .054 | .055 |
| 55.0 | .045 | .047 | .048 | .049 | .050 | .051 | .053 | .054 | .055 | .056 |
| 55.5 | −0.046 | −0.047 | −0.049 | −0.050 | −0.051 | −0.052 | −0.054 | −0.055 | −0.056 | −0.057 |
| 56.0 | .047 | .048 | .050 | .051 | .052 | .053 | .055 | .056 | .057 | .058 |
| 56.5 | .048 | .049 | .050 | .052 | .053 | .054 | .056 | .057 | .058 | .059 |
| 57.0 | .049 | .050 | .051 | .053 | .054 | .055 | .057 | .058 | .059 | .060 |
| 57.5 | .050 | .051 | .052 | .054 | .055 | .056 | .058 | .059 | .060 | .061 |
| 58.0 | −0.051 | −0.052 | −0.053 | −0.055 | −0.056 | −0.057 | −0.059 | −0.060 | −0.061 | −0.063 |
| 58.5 | .051 | .053 | .054 | .055 | .057 | .058 | .060 | .061 | .062 | .064 |
| 59.0 | .052 | .054 | .055 | .056 | .058 | .059 | .061 | .062 | .063 | .065 |
| 59.5 | .053 | .055 | .056 | .057 | .059 | .060 | .061 | .063 | .064 | .066 |
| 60.0 | .054 | .055 | .057 | .058 | .060 | .061 | .062 | .064 | .065 | .067 |
| 60.5 | −0.055 | −0.056 | −0.058 | −0.059 | −0.061 | −0.062 | −0.063 | −0.065 | −0.066 | −0.068 |
| 61.0 | .056 | .057 | .059 | .060 | .062 | .063 | .064 | .066 | .067 | .069 |
| 61.5 | .057 | .058 | .060 | .061 | .062 | .064 | .065 | .067 | .068 | .070 |
| 62.0 | .057 | .059 | .060 | .062 | .063 | .065 | .066 | .068 | .069 | .071 |
| 62.5 | .058 | .060 | .061 | .063 | .064 | .066 | .067 | .069 | .071 | .072 |
| 63.0 | −0.059 | −0.061 | −0.062 | −0.064 | −0.065 | −0.067 | −0.068 | −0.070 | −0.072 | −0.073 |
| 63.5 | .060 | .062 | .063 | .065 | .066 | 0.68 | .069 | .071 | .073 | .074 |
| 64.0 | .061 | .062 | .064 | .066 | .067 | .069 | .070 | .072 | .074 | .075 |
| 64.5 | .062 | .063 | .065 | .067 | .068 | .070 | .071 | .073 | .075 | .076 |
| 65.0 | .063 | .064 | .066 | .067 | .069 | .071 | .072 | .074 | .076 | .077 |
| 65.5 | −0.063 | −0.065 | −0.067 | −0.068 | −0.070 | −0.072 | −0.073 | −0.075 | −0.077 | −0.078 |
| 66.0 | .064 | .066 | .068 | .069 | .071 | .073 | .074 | .076 | .078 | .079 |
| 66.5 | .065 | .067 | .069 | .070 | .072 | .074 | .075 | .077 | .079 | .081 |
| 67.0 | .066 | .068 | .069 | .071 | .073 | .075 | .076 | .078 | .080 | .082 |
| 67.5 | .067 | .069 | .070 | .072 | .074 | .076 | .077 | .079 | .081 | .083 |
| 68.0 | −0.068 | −0.069 | −0.071 | −0.073 | −0.075 | −0.077 | −0.078 | −0.080 | −0.082 | −0.084 |
| 68.5 | .069 | .070 | .072 | .074 | .076 | .078 | .079 | .081 | .083 | .085 |
| 69.0 | .069 | .071 | .073 | .075 | .077 | .079 | .080 | .082 | .084 | .086 |
| 69.5 | .070 | .072 | .074 | .076 | .078 | .079 | .081 | .083 | .085 | .087 |
| 70.0 | .071 | .073 | .075 | .077 | .079 | .080 | .082 | .084 | .086 | .088 |
| 70.5 | −0.072 | −0.074 | −0.076 | −0.078 | −0.080 | −0.081 | −0.083 | −0.085 | −0.087 | −0.089 |
| 71.0 | .073 | .075 | .077 | .079 | .080 | .082 | .084 | .086 | .088 | .090 |
| 71.5 | .074 | .076 | .078 | .079 | .081 | .083 | .085 | .087 | .089 | .091 |
| 72.0 | .075 | .076 | .078 | .080 | .082 | .084 | .086 | .088 | .090 | .092 |
| 72.5 | .075 | .077 | .079 | .081 | .083 | .085 | .087 | .089 | .091 | .093 |
| 73.0 | −0.076 | −0.078 | −0.080 | −0.082 | −0.084 | −0.086 | −0.088 | −0.090 | −0.092 | −0.094 |
| 73.5 | .077 | .079 | .081 | .083 | .085 | .087 | .089 | .091 | .093 | .095 |
| 74.0 | .078 | .080 | .082 | .084 | .086 | .088 | .090 | .092 | .094 | .096 |
| 74.5 | .079 | .081 | .083 | .085 | .087 | .089 | .091 | .093 | .095 | .097 |
| 75.0 | .080 | .082 | .084 | .086 | .088 | .090 | .092 | .094 | .096 | .099 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 19.0 | 19.5 | 20.0 | 20.5 | 21.0 | 21.5 | 22.0 | 22.5 | 23.0 | 23.5 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 75°.5 | −0.081 | −0.083 | −0.085 | −0.087 | −0.089 | −0.091 | −0.093 | −0.095 | −0.097 | −0.100 |
| 76.0 | .081 | .084 | .086 | .088 | .090 | .092 | .094 | .096 | .098 | .101 |
| 76.5 | .082 | .084 | .087 | .089 | .091 | .093 | .095 | .097 | .100 | .102 |
| 77.0 | .083 | .085 | .087 | .090 | .092 | .094 | .096 | .098 | .101 | .103 |
| 77.5 | .084 | .086 | .088 | .091 | .093 | .095 | .097 | .099 | .102 | .104 |
| 78.0 | −0.085 | −0.087 | −0.089 | −0.091 | −0.094 | −0.096 | −0.098 | −0.100 | −0.103 | −0.105 |
| 78.5 | .086 | .088 | .090 | .092 | .095 | .097 | .099 | .101 | .104 | .106 |
| 79.0 | .086 | .089 | .091 | .093 | .096 | .098 | .100 | .102 | .105 | .107 |
| 79.5 | .087 | .090 | .092 | .094 | .097 | .099 | .101 | .103 | .106 | .108 |
| 80.0 | .088 | .091 | .093 | .095 | .097 | .100 | .102 | .104 | .107 | .109 |
| 80.5 | −0.089 | −0.091 | −0.094 | −0.096 | −0.098 | −0.101 | −0.103 | −0.105 | −0.108 | −0.110 |
| 81.0 | .090 | .092 | .095 | .097 | .099 | .102 | .104 | .106 | .109 | .111 |
| 81.5 | .091 | .093 | .096 | .098 | .100 | .103 | .105 | .107 | .110 | .112 |
| 82.0 | .092 | .094 | .096 | .099 | .101 | .104 | .106 | .108 | .111 | .113 |
| 82.5 | .092 | .095 | .097 | .100 | .102 | .105 | .107 | .109 | .112 | .114 |
| 83.0 | −0.093 | −0.096 | −0.098 | −0.101 | −0.103 | −0.106 | −0.108 | −0.111 | −0.113 | −0.115 |
| 83.5 | .094 | .097 | .099 | .102 | .104 | .107 | .109 | .112 | .114 | .117 |
| 84.0 | .095 | .098 | .100 | .103 | .105 | .108 | .110 | .113 | .115 | .118 |
| 84.5 | .096 | .098 | .101 | .103 | .106 | .108 | .111 | .114 | .116 | .119 |
| 85.0 | .097 | .099 | .102 | .104 | .107 | .109 | .112 | .115 | .117 | .120 |
| 85.5 | −0.098 | −0.100 | −0.103 | −0.105 | −0.108 | −0.110 | −0.113 | −0.116 | −0.118 | −0.121 |
| 86.0 | .098 | .101 | .104 | .106 | .109 | .111 | .114 | .117 | .119 | .122 |
| 86.5 | .099 | .102 | .105 | .107 | .110 | .112 | .115 | .118 | .120 | .123 |
| 87.0 | .100 | .103 | .105 | .108 | .111 | .113 | .116 | .119 | .121 | .124 |
| 87.5 | .101 | .104 | .106 | .109 | .112 | .114 | .117 | .120 | .122 | .125 |
| 88.0 | −0.102 | −0.105 | −0.107 | −0.110 | −0.113 | −0.115 | −0.118 | −0.121 | −0.123 | −0.126 |
| 88.5 | .103 | .105 | .108 | .111 | .114 | .116 | .119 | .122 | .124 | .127 |
| 89.0 | .104 | .106 | .109 | .112 | .114 | .117 | .120 | .123 | .125 | .128 |
| 89.5 | .104 | .107 | .110 | .113 | .115 | .118 | .121 | .124 | .126 | .129 |
| 90.0 | .105 | .108 | .111 | .114 | .116 | .119 | .122 | .125 | .127 | .130 |
| 90.5 | −0.106 | −0.109 | −0.112 | −0.114 | −0.117 | −0.120 | −0.123 | −0.126 | −0.128 | −0.131 |
| 91.0 | .107 | .110 | .113 | .115 | .118 | .121 | .124 | .127 | .129 | .132 |
| 91.5 | .108 | .111 | .113 | .116 | .119 | .122 | .125 | .128 | .131 | .133 |
| 92.0 | .109 | .112 | .114 | .117 | .120 | .123 | .126 | .129 | .132 | .134 |
| 92.5 | .110 | .112 | .115 | .118 | .121 | .124 | .127 | .130 | .133 | .135 |
| 93.0 | −0.110 | −0.113 | −0.116 | −0.119 | −0.122 | −0.125 | −0.128 | −0.131 | −0.134 | −0.137 |
| 93.5 | .111 | .114 | .117 | .120 | .123 | .126 | .129 | .132 | .135 | .138 |
| 94.0 | .112 | .115 | .118 | .121 | .124 | .127 | .130 | .133 | .136 | .139 |
| 94.5 | .113 | .116 | .119 | .122 | .125 | .128 | .131 | .134 | .137 | .140 |
| 95.0 | .114 | .117 | .120 | .123 | .126 | .129 | .132 | .135 | .138 | .141 |
| 95.5 | −0.115 | −0.118 | −0.121 | −0.124 | −0.127 | −0.130 | −0.133 | −0.136 | −0.139 | −0.142 |
| 96.0 | .115 | .119 | .122 | .125 | .128 | .131 | .134 | .137 | .140 | .143 |
| 96.5 | .116 | .119 | .122 | .126 | .129 | .132 | .135 | .138 | .141 | .144 |
| 97.0 | .117 | .120 | .123 | .126 | .130 | .133 | .136 | .139 | .142 | .145 |
| 97.5 | .118 | .121 | .124 | .127 | .130 | .134 | .137 | .140 | .143 | .146 |
| 98.0 | −0.119 | −0.122 | −0.125 | −0.128 | −0.131 | −0.135 | −0.138 | −0.141 | −0.144 | −0.147 |
| 98.5 | .120 | .123 | .126 | .129 | .132 | .135 | .139 | .142 | .145 | .148 |
| 99.0 | .121 | .124 | .127 | .130 | .133 | .136 | .140 | .143 | .146 | .149 |
| 99.5 | .121 | .125 | .128 | .131 | .134 | .137 | .141 | .144 | .147 | .150 |
| 100.0 | .122 | .126 | .129 | .132 | .135 | .138 | .142 | .145 | .148 | .151 |

TABLE 46.

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 24.0 | 24.2 | 24.4 | 24.6 | 24.8 | 25.0 | 25.2 | 25.4 | 25.6 | 25.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 0°.0 | +0.063 | +0.063 | +0.064 | +0.064 | +0.065 | +0.065 | +0.066 | +0.066 | +0.067 | +0.067 |
| +0.5 | +0.061 | +0.062 | +0.063 | +0.063 | +0.064 | +0.064 | +0.065 | +0.065 | +0.066 | +0.066 |
| 1.0 | .060 | .061 | .061 | .062 | .062 | .063 | .063 | .064 | .064 | .065 |
| 1.5 | .059 | .060 | .060 | .061 | .061 | .062 | .062 | .063 | .063 | .064 |
| 2.0 | .058 | .059 | .059 | .060 | .060 | .061 | .061 | .062 | .062 | .063 |
| 2.5 | .057 | .058 | .058 | .059 | .059 | .059 | .060 | .060 | .061 | .061 |
| 3.0 | +0.056 | +0.056 | +0.057 | +0.057 | +0.058 | +0.058 | +0.059 | +0.059 | +0.060 | +0.060 |
| 3.5 | .055 | .055 | .056 | .056 | .057 | .057 | .058 | .058 | .059 | .059 |
| 4.0 | .054 | .054 | .055 | .055 | .056 | .056 | .057 | .057 | .057 | .058 |
| 4.5 | .053 | .053 | .054 | .054 | .054 | .055 | .055 | .056 | .056 | .057 |
| 5.0 | .052 | .052 | .052 | .053 | .053 | .054 | .054 | .055 | .055 | .056 |
| 5.5 | +0.051 | +0.051 | +0.051 | +0.052 | +0.052 | +0.053 | +0.053 | +0.053 | +0.054 | +0.054 |
| 6.0 | .049 | .050 | .050 | .051 | .051 | .052 | .052 | .052 | .053 | .053 |
| 6.5 | .048 | .049 | .049 | .050 | .050 | .050 | .051 | .051 | .052 | .052 |
| 7.0 | .047 | .048 | .048 | .048 | .049 | .049 | .050 | .050 | .050 | .051 |
| 7.5 | .046 | .047 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .050 |
| 8.0 | +0.045 | +0.045 | +0.046 | +0.046 | +0.047 | +0.047 | +0.047 | +0.048 | +0.048 | +0.048 |
| 8.5 | .044 | .044 | .045 | .045 | .045 | .046 | .046 | .047 | .047 | .047 |
| 9.0 | .043 | .043 | .044 | .044 | .044 | .045 | .045 | .045 | .046 | .046 |
| 9.5 | .042 | .042 | .042 | .043 | .043 | .044 | .044 | .044 | .045 | .045 |
| 10.0 | .041 | .041 | .041 | .042 | .042 | .042 | .043 | .043 | .043 | .044 |
| 10.5 | +0.040 | +0.040 | +0.040 | +0.041 | +0.041 | +0.041 | +0.042 | +0.042 | +0.042 | +0.043 |
| 11.0 | .039 | .039 | .039 | .039 | .040 | .040 | .040 | .041 | .041 | .041 |
| 11.5 | .037 | .038 | .038 | .038 | .039 | .039 | .039 | .040 | .040 | .040 |
| 12.0 | .036 | .037 | .037 | .037 | .038 | .038 | .038 | .038 | .039 | .039 |
| 12.5 | .035 | .036 | .036 | .036 | .036 | .037 | .037 | .037 | .038 | .038 |
| 13.0 | +0.034 | +0.034 | +0.035 | +0.035 | +0.035 | +0.036 | +0.036 | +0.036 | +0.036 | +0.037 |
| 13.5 | .033 | .033 | .034 | .034 | .034 | .034 | .035 | .035 | .035 | .036 |
| 14.0 | .032 | .032 | .032 | .033 | .033 | .033 | .034 | .034 | .034 | .034 |
| 14.5 | .031 | .031 | .031 | .032 | .032 | .032 | .032 | .033 | .033 | .033 |
| 15.0 | .030 | .030 | .030 | .030 | .031 | .031 | .031 | .031 | .032 | .032 |
| 15.5 | +0.029 | +0.029 | +0.029 | +0.029 | +0.030 | +0.030 | +0.030 | +0.030 | +0.031 | +0.031 |
| 16.0 | .028 | .028 | .028 | .028 | .028 | .029 | .029 | .029 | .029 | .030 |
| 16.5 | .026 | .027 | .027 | .027 | .027 | .028 | .028 | .028 | .028 | .028 |
| 17.0 | .025 | .026 | .026 | .026 | .026 | .026 | .027 | .027 | .027 | .027 |
| 17.5 | .024 | .024 | .025 | .025 | .025 | .025 | .026 | .026 | .026 | .026 |
| 18.0 | +0.023 | +0.023 | +0.024 | +0.024 | +0.024 | +0.024 | +0.024 | +0.025 | +0.025 | +0.025 |
| 18.5 | .022 | .022 | .022 | .023 | .023 | .023 | .023 | .023 | .024 | .024 |
| 19.0 | .021 | .021 | .021 | .022 | .022 | .022 | .022 | .022 | .022 | .023 |
| 19.5 | .020 | .020 | .020 | .020 | .021 | .021 | .021 | .021 | .021 | .021 |
| 20.0 | .019 | .019 | .019 | .019 | .019 | .020 | .020 | .020 | .020 | .020 |
| 20.5 | +0.018 | +0.018 | +0.018 | +0.018 | +0.018 | +0.018 | +0.019 | +0.019 | +0.019 | +0.019 |
| 21.0 | .017 | .017 | .017 | .017 | .017 | .017 | .017 | .018 | .018 | .018 |
| 21.5 | .016 | .016 | .016 | .016 | .016 | .016 | .016 | .016 | .017 | .017 |
| 22.0 | .014 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .016 |
| 22.5 | .013 | .013 | .014 | .014 | .014 | .014 | .014 | .014 | .014 | .014 |
| 23.0 | +0.012 | +0.012 | +0.012 | +0.013 | +0.013 | +0.013 | +0.013 | +0.013 | +0.013 | +0.013 |
| 23.5 | .011 | .011 | .011 | .011 | .012 | .012 | .012 | .012 | .012 | .012 |
| 24.0 | .010 | .010 | .010 | .010 | .010 | .011 | .011 | .011 | .011 | .011 |
| 24.5 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .010 | .010 | .010 |
| 25.0 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .009 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 24.0 | 24.2 | 24.4 | 24.6 | 24.8 | 25.0 | 25.2 | 25.4 | 25.6 | 25.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 25°.5 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 | +0.007 |
| 26.0 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 |
| 26.5 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 |
| 27.0 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 |
| 27.5 | .002 | .002 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 28.0 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 |
| 28.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29.0 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |
| 29.5 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| 30.0 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 30.5 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 | −0.004 |
| 31.0 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .006 | .006 |
| 31.5 | .006 | .006 | .006 | .006 | .006 | .007 | .007 | .007 | .007 | .007 |
| 32.0 | .007 | .007 | .007 | .008 | .008 | .008 | .008 | .008 | .008 | .008 |
| 32.5 | .008 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 |
| 33.0 | −0.010 | −0.010 | −0.010 | −0.010 | −0.010 | −0.010 | −0.010 | −0.010 | −0.010 | −0.010 |
| 33.5 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 |
| 34.0 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .013 |
| 34.5 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .014 | .014 | .014 |
| 35.0 | .014 | .014 | .014 | .014 | .014 | .014 | .015 | .015 | .015 | .015 |
| 35.5 | −0.015 | −0.015 | −0.015 | −0.015 | −0.015 | −0.016 | −0.016 | −0.016 | −0.016 | −0.016 |
| 36.0 | .016 | .016 | .016 | .016 | .017 | .017 | .017 | .017 | .017 | .017 |
| 36.5 | .017 | .017 | .017 | .018 | .018 | .018 | .018 | .018 | .018 | .018 |
| 37.0 | .018 | .018 | .019 | .019 | .019 | .019 | .019 | .019 | .019 | .019 |
| 37.5 | .019 | .019 | .020 | .020 | .020 | .020 | .020 | .020 | .021 | .021 |
| 38.0 | −0.020 | −0.021 | −0.021 | −0.021 | −0.021 | −0.021 | −0.021 | −0.022 | −0.022 | −0.022 |
| 38.5 | .021 | .022 | .022 | .022 | .022 | .022 | .023 | .023 | .023 | .023 |
| 39.0 | .023 | .023 | .023 | .023 | .023 | .024 | .024 | .024 | .024 | .024 |
| 39.5 | .024 | .024 | .024 | .024 | .024 | .025 | .025 | .025 | .025 | .025 |
| 40.0 | .025 | .025 | .025 | .025 | .026 | .026 | .026 | .026 | .026 | .027 |
| 40.5 | −0.026 | −0.026 | −0.026 | −0.026 | −0.027 | −0.027 | −0.027 | −0.027 | −0.028 | −0.028 |
| 41.0 | .027 | .027 | .027 | .028 | .028 | .028 | .028 | .029 | .029 | .029 |
| 41.5 | .028 | .028 | .028 | .029 | .029 | .029 | .029 | .030 | .030 | .030 |
| 42.0 | .029 | .029 | .030 | .030 | .030 | .030 | .031 | .031 | .031 | .031 |
| 42.5 | .030 | .030 | .031 | .031 | .031 | .031 | .032 | .032 | .032 | .032 |
| 43.0 | −0.031 | −0.032 | −0.032 | −0.032 | −0.032 | −0.033 | −0.033 | −0.033 | −0.033 | −0.034 |
| 43.5 | .032 | .033 | .033 | .033 | .033 | .034 | .034 | .034 | .035 | .035 |
| 44.0 | .033 | .034 | .034 | .034 | .035 | .035 | .035 | .035 | .036 | .036 |
| 44.5 | .035 | .035 | .035 | .035 | .036 | .036 | .036 | .037 | .037 | .037 |
| 45.0 | .036 | .036 | .036 | .037 | .037 | .037 | .037 | .038 | .038 | .038 |
| 45.5 | −0.037 | −0.037 | −0.037 | −0.038 | −0.038 | −0.038 | −0.039 | −0.039 | −0.039 | −0.039 |
| 46.0 | .038 | .038 | .038 | .039 | .039 | .039 | .040 | .040 | .040 | .041 |
| 46.5 | .039 | .039 | .040 | .040 | .040 | .041 | .041 | .041 | .041 | .042 |
| 47.0 | .040 | .040 | .041 | .041 | .041 | .042 | .042 | .042 | .043 | .043 |
| 47.5 | .041 | .041 | .042 | .042 | .042 | .043 | .043 | .043 | .044 | .044 |
| 48.0 | −0.042 | −0.042 | −0.043 | −0.043 | −0.044 | −0.044 | −0.044 | −0.045 | −0.045 | −0.045 |
| 48.5 | .043 | .044 | .044 | .044 | .045 | .045 | .045 | .046 | .046 | .046 |
| 49.0 | .044 | .045 | .045 | .045 | .046 | .046 | .047 | .047 | .047 | .048 |
| 49.5 | .045 | .046 | .046 | .047 | .047 | .047 | .048 | .048 | .048 | .049 |
| 50.0 | .046 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .050 | .050 |

Table 46.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 24.0 | 24.2 | 24.4 | 24.6 | 24.8 | 25.0 | 25.2 | 25.4 | 25.6 | 25.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 50°.5 | −0.048 | −0.048 | −0.048 | −0.049 | −0.049 | −0.050 | −0.050 | −0.050 | −0.051 | −0.051 |
| 51.0 | .049 | .049 | .049 | .050 | .050 | .051 | .051 | .051 | .052 | .052 |
| 51.5 | .050 | .050 | .051 | .051 | .051 | .052 | .052 | .053 | .053 | .053 |
| 52.0 | .051 | .051 | .052 | .052 | .053 | .053 | .053 | .054 | .054 | .055 |
| 52.5 | .052 | .052 | .053 | .053 | .054 | .054 | .055 | .055 | .055 | .056 |
| 53.0 | −0.053 | −0.053 | −0.054 | −0.054 | −0.055 | −0.055 | −0.056 | −0.056 | −0.057 | −0.057 |
| 53.5 | .054 | .055 | .055 | .055 | .056 | .056 | .057 | .057 | .058 | .058 |
| 54.0 | .055 | .056 | .056 | .057 | .057 | .057 | .058 | .058 | .059 | .059 |
| 54.5 | .056 | .057 | .057 | .058 | .058 | .059 | .059 | .060 | .060 | .060 |
| 55.0 | .057 | .058 | .058 | .059 | .059 | .060 | .060 | .061 | .061 | .062 |
| 55.5 | −0.058 | −0.059 | −0.059 | −0.060 | −0.060 | −0.061 | −0.061 | −0.062 | −0.062 | −0.063 |
| 56.0 | .060 | .060 | .060 | .061 | .061 | .062 | .062 | .063 | .063 | .064 |
| 56.5 | .061 | .061 | .062 | .062 | .063 | .063 | .064 | .064 | .065 | .065 |
| 57.0 | .062 | .062 | .063 | .063 | .064 | .064 | .065 | .065 | .066 | .066 |
| 57.5 | .063 | .063 | .064 | .064 | .065 | .065 | .066 | .066 | .067 | .067 |
| 58.0 | −0.064 | −0.064 | −0.065 | −0.065 | −0.066 | −0.066 | −0.067 | −0.068 | −0.068 | −0.069 |
| 58.5 | .065 | .065 | .066 | .067 | .067 | .068 | .068 | .069 | .069 | .070 |
| 59.0 | .066 | .067 | .067 | .068 | .068 | .069 | .069 | .070 | .070 | .071 |
| 59.5 | .067 | .068 | .068 | .069 | .069 | .070 | .070 | .071 | .072 | .072 |
| 60.0 | .068 | .069 | .069 | .070 | .070 | .071 | .072 | .072 | .073 | .073 |
| 60.5 | −0.069 | −0.070 | −0.070 | −0.071 | −0.072 | −0.072 | −0.073 | −0.073 | −0.074 | −0.074 |
| 61.0 | .070 | .071 | .072 | .072 | .073 | .073 | .074 | .074 | .075 | .076 |
| 61.5 | .071 | .072 | .073 | .073 | .074 | .074 | .075 | .076 | .076 | .077 |
| 62.0 | .073 | .073 | .074 | .074 | .075 | .076 | .076 | .077 | .077 | .078 |
| 62.5 | .074 | .074 | .075 | .075 | .076 | .077 | .077 | .078 | .078 | .079 |
| 63.0 | −0.075 | −0.075 | −0.076 | −0.077 | −0.077 | −0.078 | −0.078 | −0.079 | −0.080 | −0.080 |
| 63.5 | .076 | .076 | .077 | .078 | .078 | .079 | .080 | .080 | .081 | .081 |
| 64.0 | .077 | .077 | .078 | .079 | .079 | .080 | .081 | .081 | .082 | .082 |
| 64.5 | .078 | .079 | .079 | .080 | .081 | .081 | .082 | .082 | .083 | .084 |
| 65.0 | .079 | .080 | .080 | .081 | .082 | .082 | .083 | .084 | .084 | .085 |
| 65.5 | −0.080 | −0.081 | −0.081 | −0.082 | −0.083 | −0.083 | −0.084 | −0.085 | −0.085 | −0.086 |
| 66.0 | .081 | .082 | .083 | .083 | .084 | .085 | .085 | .086 | .087 | .087 |
| 66.5 | .082 | .083 | .084 | .084 | .085 | .086 | .086 | .087 | .088 | .088 |
| 67.0 | .083 | .084 | .085 | .085 | .086 | .087 | .087 | .088 | .089 | .090 |
| 67.5 | .084 | .085 | .086 | .087 | .087 | .088 | .089 | .089 | .090 | .091 |
| 68.0 | −0.085 | −0.086 | −0.087 | −0.088 | −0.088 | −0.089 | −0.090 | −0.090 | −0.091 | −0.092 |
| 68.5 | .087 | .087 | .088 | .089 | .089 | .090 | .091 | .092 | .092 | .093 |
| 69.0 | .088 | .088 | .089 | .090 | .091 | .091 | .092 | .093 | .093 | .094 |
| 69.5 | .089 | .089 | .090 | .091 | .092 | .092 | .093 | .094 | .095 | .095 |
| 70.0 | .090 | .091 | .091 | .092 | .093 | .094 | .094 | .095 | .096 | .097 |
| 70.5 | −0.091 | −0.092 | −0.092 | −0.093 | −0.094 | −0.095 | −0.095 | −0.096 | −0.097 | −0.098 |
| 71.0 | .092 | .093 | .094 | .094 | .095 | .096 | .097 | .097 | .098 | .099 |
| 71.5 | .093 | .094 | .095 | .095 | .096 | .097 | .098 | .098 | .099 | .100 |
| 72.0 | .094 | .095 | .096 | .096 | .097 | .098 | .099 | .100 | .100 | .101 |
| 72.5 | .095 | .096 | .097 | .098 | .098 | .099 | .100 | .101 | .102 | .102 |
| 73.0 | −0.096 | −0.097 | −0.098 | −0.099 | −0.100 | −0.100 | −0.101 | −0.102 | −0.103 | −0.104 |
| 73.5 | .097 | .098 | .099 | .100 | .101 | .101 | .102 | .103 | .104 | .105 |
| 74.0 | .098 | .099 | .100 | .101 | .102 | .103 | .103 | .104 | .105 | .106 |
| 74.5 | .100 | .100 | .101 | .102 | .103 | .104 | .105 | .105 | .106 | .107 |
| 75.0 | .101 | .101 | .102 | .103 | .104 | .105 | .106 | .106 | .107 | .108 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 24.0 | 24.2 | 24.4 | 24.6 | 24.8 | 25.0 | 25.2 | 25.4 | 25.6 | 25.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 75°.5 | −0.102 | −0.103 | −0.103 | −0.104 | −0.105 | −0.106 | −0.107 | −0.108 | −0.108 | −0.109 |
| 76.0 | .103 | .104 | .104 | .105 | .106 | .107 | .108 | .109 | .110 | .110 |
| 76.5 | .104 | .105 | .106 | .106 | .107 | .108 | .109 | .110 | .111 | .112 |
| 77.0 | .105 | .106 | .107 | .108 | .108 | .109 | .110 | .111 | .112 | .113 |
| 77.5 | .106 | .107 | .108 | .109 | .110 | .110 | .111 | .112 | .113 | .114 |
| 78.0 | −0.107 | −0.108 | −0.109 | −0.110 | −0.111 | −0.112 | −0.112 | −0.113 | −0.114 | −0.115 |
| 78.5 | .108 | .109 | .110 | .111 | .112 | .113 | .114 | .114 | .115 | .116 |
| 79.0 | .109 | .110 | .111 | .112 | .113 | .114 | .115 | .116 | .117 | .117 |
| 79.5 | .110 | .111 | .112 | .113 | .114 | .115 | .116 | .117 | .118 | .119 |
| 80.0 | .111 | .112 | .113 | .114 | .115 | .116 | .117 | .118 | .119 | .120 |
| 80.5 | −0.112 | −0.113 | −0.114 | −0.115 | −0.116 | −0.117 | −0.118 | −0.119 | −0.120 | −0.121 |
| 81.0 | .114 | .115 | .115 | .116 | .117 | .118 | .119 | .120 | .121 | .122 |
| 81.5 | .115 | .116 | .117 | .118 | .118 | .119 | .120 | .121 | .122 | .123 |
| 82.0 | .116 | .117 | .118 | .119 | .120 | .121 | .122 | .122 | .123 | .124 |
| 82.5 | .117 | .118 | .119 | .120 | .121 | .122 | .123 | .124 | .125 | .126 |
| 83.0 | −0.118 | −0.119 | −0.120 | −0.121 | −0.122 | −0.123 | −0.124 | −0.125 | −0.126 | −0.127 |
| 83.5 | .119 | .120 | .121 | .122 | .123 | .124 | .125 | .126 | .127 | .128 |
| 84.0 | .120 | .121 | .122 | .123 | .124 | .125 | .126 | .127 | .128 | .129 |
| 84.5 | .121 | .122 | .123 | .124 | .125 | .126 | .127 | .128 | .129 | .130 |
| 85.0 | .122 | .123 | .124 | .125 | .126 | .127 | .128 | .129 | .130 | .131 |
| 85.5 | −0.123 | −0.124 | −0.125 | −0.126 | −0.127 | −0.128 | −0.129 | −0.130 | −0.131 | −0.133 |
| 86.0 | .124 | .125 | .126 | .127 | .128 | .130 | .131 | .132 | .133 | .134 |
| 86.5 | .125 | .126 | .128 | .129 | .130 | .131 | .132 | .133 | .134 | .135 |
| 87.0 | .126 | .128 | .129 | .130 | .131 | .132 | .133 | .134 | .135 | .136 |
| 87.5 | .128 | .129 | .130 | .131 | .132 | .133 | .134 | .135 | .136 | .137 |
| 88.0 | −0.129 | −0.130 | −0.131 | −0.132 | −0.133 | −0.134 | −0.135 | −0.136 | −0.137 | −0.138 |
| 88.5 | .130 | .131 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .139 |
| 89.0 | .131 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .140 | .141 |
| 89.5 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .140 | .141 | .142 |
| 90.0 | .133 | .134 | .135 | .136 | .137 | .138 | .140 | .141 | .142 | .143 |
| 90.5 | −0.134 | −0.135 | −0.136 | −0.137 | −01.39 | −0.140 | −0.141 | −0.142 | −0.143 | −0.144 |
| 91.0 | .135 | .136 | .137 | .138 | .140 | .141 | .142 | .143 | .144 | .145 |
| 91.5 | .136 | .137 | .138 | .140 | .141 | .142 | .143 | .144 | .145 | .146 |
| 92.0 | .137 | .138 | .140 | .141 | .142 | .143 | .144 | .145 | .146 | .148 |
| 92.5 | .138 | .139 | .141 | .142 | .143 | .144 | .145 | .146 | .148 | .149 |
| 93.0 | −0.139 | −0.141 | −0.142 | −0.143 | −0.144 | −0.145 | −0.146 | −0.148 | −0.149 | −0.150 |
| 93.5 | .140 | .142 | .143 | .144 | .145 | .146 | .148 | .149 | .150 | .151 |
| 94.0 | .142 | .143 | .144 | .145 | .146 | .147 | .149 | .150 | .151 | .152 |
| 94.5 | .143 | .144 | .145 | .146 | .147 | .149 | .150 | .151 | .152 | .153 |
| 95.0 | .144 | .145 | .146 | .147 | .149 | .150 | .151 | .152 | .153 | .154 |
| 95.5 | −0.145 | −0.146 | −0.147 | −0.148 | −0.150 | −0.151 | −0.152 | −0.153 | −0.154 | −0.156 |
| 96.0 | .146 | .147 | .148 | .150 | .151 | .152 | .153 | .154 | .156 | .157 |
| 96.5 | .147 | .148 | .149 | .151 | .152 | .153 | .154 | .156 | .157 | .158 |
| 97.0 | .148 | .149 | .150 | .152 | .153 | .154 | .155 | .157 | .158 | .159 |
| 97.5 | .149 | .150 | .152 | .153 | .154 | .155 | .157 | .158 | .159 | .160 |
| 98.0 | −0.150 | −0.151 | −0.153 | −0.154 | −0.155 | −0.156 | −0.158 | −0.159 | −0.160 | −0.161 |
| 98.5 | .151 | .153 | .154 | .155 | .156 | .158 | .159 | .160 | .161 | .163 |
| 99.0 | .152 | .154 | .155 | .156 | .157 | .159 | .160 | .161 | .162 | .164 |
| 99.5 | .153 | .155 | .156 | .157 | .159 | .160 | .161 | .162 | .164 | .165 |
| 100.0 | .154 | .156 | .157 | .158 | .160 | .161 | .162 | .163 | .165 | .166 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 26.0 | 26.2 | 26.4 | 26.6 | 26.8 | 27.0 | 27.2 | 27.4 | 27.6 | 27.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 0°.0 | +0.068 | +0.068 | +0.069 | +0.069 | +0.070 | +0.070 | +0.071 | +0.071 | +0.072 | +0.072 |
| +0.5 | +0.067 | +0.067 | +0.068 | +0.068 | +0.069 | +0.069 | +0.070 | +0.070 | +0.071 | +0.071 |
| 1.0 | .065 | .066 | .066 | .067 | .067 | .068 | .068 | .069 | .069 | .070 |
| 1.5 | .064 | .065 | .065 | .066 | .066 | .067 | .067 | .068 | .068 | .069 |
| 2.0 | .063 | .064 | .064 | .065 | .065 | .065 | .066 | .066 | .067 | .067 |
| 2.5 | .062 | .062 | .063 | .063 | .064 | .064 | .065 | .065 | .066 | .066 |
| 3.0 | +0.061 | +0.061 | +0.062 | +0.062 | +0.063 | +0.063 | +0.063 | +0.064 | +0.064 | +0.065 |
| 3.5 | .059 | .060 | .060 | .061 | .061 | .062 | .062 | .063 | .063 | .064 |
| 4.0 | .058 | .059 | .059 | .060 | .060 | .061 | .061 | .061 | .062 | .062 |
| 4.5 | .057 | .058 | .058 | .058 | .059 | .059 | .060 | .060 | .061 | .061 |
| 5.0 | .056 | .056 | .057 | .057 | .058 | .058 | .059 | .059 | .059 | .060 |
| 5.5 | +0.055 | +0.055 | +0.056 | +0.056 | +0.056 | +0.057 | +0.057 | +0.058 | +0.058 | +0.059 |
| 6.0 | .054 | .054 | .054 | .055 | .055 | .056 | .056 | .056 | .057 | .057 |
| 6.5 | .052 | .053 | .053 | .054 | .054 | .054 | .055 | .055 | .056 | .056 |
| 7.0 | .051 | .052 | .052 | .052 | .053 | .053 | .054 | .054 | .054 | .055 |
| 7.5 | .050 | .050 | .051 | .051 | .052 | .052 | .052 | .053 | .053 | .053 |
| 8.0 | +0.049 | +0.049 | +0.050 | +0.050 | +0.050 | +0.051 | +0.051 | +0.051 | +0.052 | +0.052 |
| 8.5 | .048 | .048 | .048 | .049 | .049 | .049 | .050 | .050 | .051 | .051 |
| 9.0 | .046 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .049 | .050 |
| 9.5 | .045 | .046 | .046 | .046 | .047 | .047 | .047 | .048 | .048 | .048 |
| 10.0 | .044 | .044 | .045 | .045 | .045 | .046 | .046 | .046 | .047 | .047 |
| 10.5 | +0.043 | +0.043 | +0.044 | +0.044 | +0.044 | +0.045 | +0.045 | +0.045 | +0.046 | +0.046 |
| 11.0 | .042 | .042 | .042 | .043 | .043 | .043 | .044 | .044 | .044 | .045 |
| 11.5 | .041 | .041 | .041 | .041 | .042 | .042 | .042 | .043 | .043 | .043 |
| 12.0 | .039 | .040 | .040 | .040 | .041 | .041 | .041 | .041 | .042 | .042 |
| 12.5 | .038 | .038 | .039 | .039 | .039 | .040 | .040 | .040 | .040 | .041 |
| 13.0 | +0.037 | +0.037 | +0.038 | +0.038 | +0.038 | +0.038 | +0.039 | +0.039 | +0.039 | +0.040 |
| 13.5 | .036 | .036 | .036 | .037 | .037 | .037 | .037 | .038 | .038 | .038 |
| 14.0 | .035 | .035 | .035 | .035 | .036 | .036 | .036 | .036 | .037 | .037 |
| 14.5 | .033 | .034 | .034 | .034 | .034 | .035 | .035 | .035 | .035 | .036 |
| 15.0 | .032 | .032 | .033 | .033 | .033 | .033 | .034 | .034 | .034 | .034 |
| 15.5 | +0.031 | +0.031 | +0.032 | +0.032 | +0.032 | +0.032 | +0.032 | +0.033 | +0.033 | +0.033 |
| 16.0 | .030 | .030 | .030 | .031 | .031 | .031 | .031 | .031 | .032 | .032 |
| 16.5 | .029 | .029 | .029 | .029 | .030 | .030 | .030 | .030 | .030 | .031 |
| 17.0 | .027 | .028 | .028 | .028 | .028 | .029 | .029 | .029 | .029 | .029 |
| 17.5 | .026 | .027 | .027 | .027 | .027 | .027 | .028 | .028 | .028 | .028 |
| 18.0 | +0.025 | +0.025 | +0.026 | +0.026 | +0.026 | +0.026 | +0.026 | +0.026 | +0.027 | +0.027 |
| 18.5 | .024 | .024 | .024 | .024 | .025 | .025 | .025 | .025 | .025 | .026 |
| 19.0 | .023 | .023 | .023 | .023 | .023 | .024 | .024 | .024 | .024 | .024 |
| 19.5 | .022 | .022 | .022 | .022 | .022 | .022 | .023 | .023 | .023 | .023 |
| 20.0 | .020 | .021 | .021 | .021 | .021 | .021 | .021 | .021 | .022 | .022 |
| 20.5 | +0.019 | +0.019 | +0.020 | +0.020 | +0.020 | +0.020 | +0.020 | +0.020 | +0.020 | +0.021 |
| 21.0 | .018 | .018 | .018 | .018 | .019 | .019 | .019 | .019 | .019 | .019 |
| 21.5 | .017 | .017 | .017 | .017 | .017 | .017 | .018 | .018 | .018 | .018 |
| 22.0 | .016 | .016 | .016 | .016 | .016 | .016 | .016 | .017 | .017 | .017 |
| 22.5 | .014 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 |
| 23.0 | +0.013 | +0.013 | +0.014 | +0.014 | +0.014 | +0.014 | +0.014 | +0.014 | +0.014 | +0.014 |
| 23.5 | .012 | .012 | .012 | .012 | .012 | .013 | .013 | .013 | .013 | .013 |
| 24.0 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .012 | .012 | .012 |
| 24.5 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .110 |
| 25.0 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 26.0 | 26.2 | 26.4 | 26.6 | 26.8 | 27.0 | 27.2 | 27.4 | 27.6 | 27.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 25°.5 | +0.007 | +0.007 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 |
| 26.0 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .007 | .007 | .007 |
| 26.5 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 | .005 |
| 27.0 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 |
| 27.5 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 28.0 | +0.001 | +0.001 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 |
| 28.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29.0 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |
| 29.5 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| 30.0 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 30.5 | −0.004 | −0.004 | −0.004 | −0 005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 |
| 31.0 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 |
| 31.5 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 |
| 32.0 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .009 |
| 32.5 | .009 | .009 | .009 | .009 | .009 | .009 | .010 | .010 | .010 | .010 |
| 33.0 | −0.010 | −0.010 | −0.010 | −0.011 | −0.011 | −0.011 | −0.011 | −0.011 | −0.011 | −0.011 |
| 33.5 | .011 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .012 |
| 34.0 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .014 |
| 34.5 | .014 | .014 | .014 | .014 | .014 | .014 | .014 | .015 | .015 | .015 |
| 35.0 | .015 | .015 | .015 | .015 | .015 | .016 | .016 | .016 | .016 | .016 |
| 35.5 | −0.016 | −0.016 | −0.016 | −0.017 | −0.017 | −0.017 | −0.017 | −0.017 | −0.017 | −0.017 |
| 36.0 | .017 | .018 | .018 | .018 | .018 | .018 | .018 | .018 | .018 | .019 |
| 36.5 | .019 | .019 | .019 | .019 | .019 | .019 | .019 | .020 | .020 | .020 |
| 37.0 | .020 | .020 | .020 | .020 | .020 | .021 | .021 | .021 | .021 | .021 |
| 37.5 | .021 | .021 | .021 | .021 | .022 | .022 | .022 | .022 | .022 | .022 |
| 38.0 | −0.022 | −0.022 | −0.022 | −0.023 | −0.023 | −0.023 | −0.023 | −0.023 | −0.023 | −0.024 |
| 38.5 | .023 | .023 | .024 | .024 | .024 | .024 | .024 | .025 | .025 | .025 |
| 39.0 | .024 | .025 | .025 | .025 | .025 | .025 | .026 | .026 | .026 | .026 |
| 39.5 | .026 | .026 | .026 | .026 | .026 | .027 | .027 | .027 | .027 | .027 |
| 40.0 | .027 | .027 | .027 | .027 | .028 | .028 | .028 | .028 | .028 | .029 |
| 40.5 | −0.028 | −0.028 | −0.028 | −0.029 | −0.029 | −0.029 | −0.029 | −0.030 | −0.030 | −0.030 |
| 41.0 | .029 | .029 | .030 | .030 | .030 | .030 | .031 | .031 | .031 | .031 |
| 41.5 | .030 | .031 | .031 | .031 | .031 | .032 | .032 | .032 | .032 | .032 |
| 42.0 | .032 | .032 | .032 | .032 | .033 | .033 | .033 | .033 | .033 | .034 |
| 42.5 | .033 | .033 | .033 | .033 | .034 | .034 | .034 | .034 | .035 | .035 |
| 43.0 | −0.034 | −0.034 | −0.034 | −0.035 | −0.035 | −0.035 | −0.035 | −0.036 | −0.036 | −0.036 |
| 43.5 | .035 | .035 | .036 | .036 | .036 | .036 | .037 | .037 | .037 | .037 |
| 44.0 | .036 | .037 | .037 | .037 | .037 | .038 | .038 | .038 | .038 | .039 |
| 44.5 | .037 | .038 | .038 | .038 | .039 | .039 | .039 | .039 | .040 | .040 |
| 45.0 | .039 | .039 | .039 | .039 | .040 | .040 | .040 | .041 | .041 | .041 |
| 45.5 | −0.040 | −0.040 | −0.040 | −0.041 | −0.041 | −0.041 | −0.042 | −0.042 | −0.042 | −0.043 |
| 46.0 | .041 | .041 | .042 | .042 | .042 | .043 | .043 | .043 | .043 | .044 |
| 46.5 | .042 | .042 | .043 | .043 | .043 | .044 | .044 | .044 | .045 | .045 |
| 47.0 | .043 | .044 | .044 | .044 | .045 | .045 | .045 | .046 | .046 | .046 |
| 47.5 | .045 | .045 | .045 | .046 | .046 | .046 | .047 | .047 | .047 | .048 |
| 48.0 | −0.046 | −0.046 | −0.046 | −0.047 | −0.047 | −0.047 | −0.048 | −0.048 | −0.048 | −0.049 |
| 48.5 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .049 | .050 | .050 |
| 49.0 | .048 | .048 | .049 | .049 | .049 | .050 | .050 | .051 | .051 | .051 |
| 49.5 | .049 | .050 | .050 | .050 | .051 | .051 | .051 | .052 | .052 | .053 |
| 50.0 | .050 | .051 | .051 | .052 | .052 | .052 | .053 | .053 | .053 | .054 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 26.0 | 26.2 | 26.4 | 26.6 | 26.8 | 27.0 | 27.2 | 27.4 | 27.6 | 27.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| **50°.5** | −0.052 | −0.052 | −0.052 | −0.053 | −0.053 | −0.054 | −0.054 | −0.054 | −0.055 | −0.055 |
| 51.0 | .053 | .053 | .054 | .054 | .054 | .055 | .055 | .056 | .056 | .056 |
| 51.5 | .054 | .054 | .055 | .055 | .056 | .056 | .056 | .057 | .057 | .058 |
| 52.0 | .055 | .055 | .056 | .056 | .057 | .057 | .058 | .058 | .058 | .059 |
| 52.5 | .056 | .057 | .057 | .058 | .058 | .058 | .059 | .059 | .060 | .060 |
| **53.0** | −0.057 | −0.058 | −0.058 | −0.059 | −0.059 | −0.060 | −0.060 | −0.061 | −0.061 | −0.061 |
| 53.5 | .059 | .059 | .059 | .060 | .060 | .061 | .061 | .062 | .062 | .063 |
| 54.0 | .060 | .060 | .061 | .061 | .062 | .062 | .063 | .063 | .063 | .064 |
| 54.5 | .061 | .061 | .062 | .062 | .063 | .063 | .064 | .064 | .065 | .065 |
| 55.0 | .062 | .063 | .063 | .064 | .064 | .064 | .065 | .065 | .066 | .066 |
| **55.5** | −0.063 | −0.064 | −0.064 | −0.065 | −0.065 | −0.066 | −0.066 | −0.067 | −0.067 | −0.068 |
| 56.0 | .064 | .065 | .065 | .066 | .066 | .067 | .067 | .068 | .068 | .069 |
| 56.5 | .066 | .066 | .067 | .067 | .068 | .068 | .069 | .069 | .070 | .070 |
| 57.0 | .067 | .067 | .068 | .068 | .069 | .069 | .070 | .070 | .071 | .071 |
| 57.5 | .068 | .069 | .069 | .070 | .070 | .071 | .071 | .072 | .072 | .073 |
| **58.0** | −0.069 | −0.070 | −0.070 | −0.071 | −0.071 | −0.072 | −0.072 | −0.073 | −0.073 | −0.074 |
| 58.5 | .070 | .071 | .071 | .072 | .072 | .073 | .074 | .074 | .075 | .075 |
| 59.0 | .072 | .072 | .073 | .073 | .074 | .074 | .075 | .075 | .076 | .076 |
| 59.5 | .073 | .073 | .074 | .074 | .075 | .075 | .076 | .077 | .077 | .078 |
| 60.0 | .074 | .074 | .075 | .076 | .076 | .077 | .077 | .078 | .078 | .079 |
| **60.5** | −0.075 | −0.076 | −0.076 | −0.077 | −0.077 | −0.078 | −0.078 | −0.079 | −0.080 | −0.080 |
| 61.0 | .076 | .077 | .077 | .078 | .079 | .079 | .080 | .080 | .081 | .081 |
| 61.5 | .077 | .078 | .079 | .079 | .080 | .080 | .081 | .082 | .082 | .083 |
| 62.0 | .079 | .079 | .080 | .080 | .081 | .082 | .082 | .083 | .083 | .084 |
| 62.5 | .080 | .080 | .081 | .082 | .082 | .083 | .083 | .084 | .085 | .085 |
| **63.0** | −0.081 | −0.082 | −0.082 | −0.083 | −0.083 | −0.084 | −0.085 | −0.085 | −0.086 | −0.086 |
| 63.5 | .082 | .083 | .083 | .084 | .085 | .085 | .086 | .086 | .087 | .088 |
| 64.0 | .083 | .084 | .085 | .085 | .086 | .086 | .087 | .088 | .088 | .089 |
| 64.5 | .084 | .085 | .086 | .086 | .087 | .088 | .088 | .089 | .090 | .090 |
| 65.0 | .086 | .086 | .087 | .088 | .088 | .089 | .090 | .090 | .091 | .092 |
| **65.5** | −0.087 | −0.087 | 0.088 | −0.089 | −0.089 | −0.090 | −0.091 | −0.091 | −0.092 | −0.093 |
| 66.0 | .088 | .089 | .089 | .090 | .091 | .091 | .092 | .093 | .093 | .094 |
| 66.5 | .089 | .090 | .090 | .091 | .092 | .093 | .093 | .094 | .095 | .095 |
| 67.0 | .090 | .091 | .092 | .092 | .093 | .094 | .094 | .095 | .096 | .097 |
| 67.5 | .092 | .092 | .093 | .094 | .094 | .095 | .096 | .096 | .097 | .098 |
| **68.0** | −0.093 | −0.093 | −0.094 | −0.095 | −0.095 | −0.096 | −0.097 | −0.098 | −0.098 | −0.099 |
| 68.5 | .094 | .095 | .095 | .096 | .097 | .097 | .098 | .099 | .100 | .100 |
| 69.0 | .095 | .096 | .096 | .097 | .098 | .099 | .099 | .100 | .101 | .102 |
| 69.5 | .096 | .097 | .098 | .098 | .099 | .100 | .101 | .101 | .102 | .103 |
| 70.0 | .097 | .098 | .099 | .100 | .100 | .101 | .102 | .103 | .103 | .104 |
| **70.5** | −0.098 | −0.099 | −0.100 | −0.101 | −0.101 | −0.102 | −0.103 | −0.104 | −0.105 | −0.105 |
| 71.0 | .100 | .100 | .101 | .102 | .103 | .103 | .104 | .105 | .106 | .107 |
| 71.5 | .101 | .102 | .102 | .103 | .104 | .105 | .105 | .106 | .107 | .108 |
| 72.0 | .102 | .103 | .104 | .104 | .105 | .106 | .107 | .107 | .108 | .109 |
| 72.5 | .103 | .104 | .105 | .106 | .106 | .107 | .108 | .109 | .109 | .110 |
| **73.0** | −0.104 | −0.105 | −0.106 | −0.107 | −0.108 | −0.108 | −0.109 | −0.110 | −0.111 | −0.112 |
| 73.5 | .105 | .106 | .107 | .108 | .109 | .110 | .110 | .111 | .112 | .113 |
| 74.0 | .107 | .107 | .108 | .109 | .110 | .111 | .112 | .112 | .113 | .114 |
| 74.5 | .108 | .109 | .109 | .110 | .111 | .112 | .113 | .114 | 11.4 | .115 |
| 75.0 | .109 | .110 | .111 | .112 | .112 | .113 | .114 | .115 | 116 | .117 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 26.0 | 26.2 | 26.4 | 26.6 | 26.8 | 27.0 | 27.2 | 27.4 | 27.6 | 27.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 75°.5 | −0.110 | −0.111 | −0.112 | −0.113 | −0.114 | −0.114 | −0.115 | −0.116 | −0.117 | −0.118 |
| 76.0 | .111 | .112 | .113 | .114 | .115 | .116 | .116 | .117 | .118 | .119 |
| 76.5 | .113 | .113 | .114 | .115 | .116 | .117 | .118 | .119 | .119 | .120 |
| 77.0 | .114 | .115 | .115 | .116 | .117 | .118 | .119 | .120 | .121 | .122 |
| 77.5 | .115 | .116 | .117 | .117 | .118 | .119 | .120 | .121 | .122 | .123 |
| 78.0 | −0.116 | −0.117 | −0.118 | −0.119 | −0.120 | −0.120 | −0.121 | −0.122 | −0.123 | −0.124 |
| 78.5 | .117 | .118 | .119 | .120 | .121 | .122 | .123 | .123 | .124 | .125 |
| 79.0 | .118 | .119 | .120 | .121 | .122 | .123 | .124 | .125 | .126 | .127 |
| 79.5 | .120 | .120 | .121 | .122 | .123 | .124 | .125 | .126 | .127 | .128 |
| 80.0 | .121 | .122 | .123 | .123 | .124 | .125 | .126 | .127 | .128 | .129 |
| 80.5 | −0.122 | −0.123 | −0.124 | −0.125 | −0.126 | −0.127 | −0.127 | −0.128 | −0.129 | −0.130 |
| 81.0 | .123 | .124 | .125 | .126 | .127 | .128 | .129 | .130 | .131 | .132 |
| 81.5 | .124 | .125 | .126 | .127 | .128 | .129 | .130 | .131 | .132 | .133 |
| 82.0 | .125 | .126 | .127 | .128 | .129 | .130 | .131 | .132 | .133 | .134 |
| 82.5 | .127 | .128 | .128 | .129 | .130 | .131 | .132 | .133 | .134 | .135 |
| 83.0 | −0.128 | −0.129 | −0.130 | −0.131 | −0.132 | −0.133 | −0.134 | −0.135 | −0.136 | −0.137 |
| 83.5 | .129 | .130 | .131 | .132 | .133 | .134 | .135 | .136 | .137 | .138 |
| 84.0 | .130 | .131 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .139 |
| 84.5 | .131 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .139 | .140 |
| 85.0 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .139 | .141 | .142 |
| 85.5 | −0.134 | −0.135 | −0.136 | −0.137 | −0.138 | −0.139 | −0.140 | −0.141 | −0.142 | −0.143 |
| 86.0 | .135 | .136 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .144 |
| 86.5 | .136 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .144 | .145 |
| 87.0 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .144 | .145 | .147 |
| 87.5 | .138 | .139 | .140 | .141 | .142 | .144 | .145 | .146 | .147 | .148 |
| 88.0 | −0.139 | −0.140 | −0.142 | −0.143 | −0.144 | −0.145 | −0.146 | −0.147 | −0.148 | −0.149 |
| 88.5 | .141 | .142 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .150 |
| 89.0 | .142 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .150 | .152 |
| 89.5 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .151 | .152 | .153 |
| 90.0 | .144 | .145 | .146 | .147 | .148 | .150 | .151 | .152 | .153 | .154 |
| 90.5 | −0.145 | −0.146 | −0.147 | −0.149 | −0.150 | −0.151 | −0.152 | −0.153 | −0.154 | −0.155 |
| 91.0 | .146 | .147 | .149 | .150 | .151 | .152 | .153 | .154 | .155 | .157 |
| 91.5 | .148 | .149 | .150 | .151 | .152 | .153 | .154 | .155 | .157 | .158 |
| 92.0 | .149 | .150 | .151 | .152 | .153 | .154 | .156 | .157 | .158 | .159 |
| 92.5 | .150 | .151 | .152 | .153 | .154 | .156 | .157 | .158 | .159 | .160 |
| 93.0 | −0.151 | −0.152 | −0.153 | −0.155 | −0.156 | −0.157 | −0.158 | −0.159 | −0.160 | −0.161 |
| 93.5 | .152 | .153 | .155 | .156 | .157 | .158 | .159 | .160 | .162 | .163 |
| 94.0 | .153 | .155 | .156 | .157 | .158 | .159 | .160 | .162 | .163 | .164 |
| 94.5 | .155 | .156 | .157 | .158 | .159 | .160 | .162 | .163 | .164 | .165 |
| 95.0 | .156 | .157 | .158 | .159 | .160 | .162 | .163 | .164 | .165 | .166 |
| 95.5 | −0.157 | −0.158 | −0.159 | −0.160 | −0.162 | −0.163 | −0.164 | −0.165 | −0.167 | −0.168 |
| 96.0 | .158 | .159 | .160 | .162 | .163 | .164 | .165 | .167 | .168 | .169 |
| 96.5 | .159 | .160 | .162 | .163 | .164 | .165 | .167 | .168 | .169 | .170 |
| 97.0 | .160 | .162 | .163 | .164 | .165 | .167 | .168 | .169 | .170 | .171 |
| 97.5 | .162 | .163 | .164 | .165 | .166 | .168 | .169 | .170 | .171 | .173 |
| 98.0 | −0.163 | −0.164 | −0.165 | −0.166 | −0.168 | −0.169 | −0.170 | −0.171 | −0.173 | −0.174 |
| 98.5 | .164 | .165 | .166 | .168 | .169 | .170 | .171 | .173 | .174 | .175 |
| 99.0 | .165 | .166 | .168 | .169 | .170 | .171 | .173 | .174 | .175 | .176 |
| 99.5 | .166 | .167 | .169 | .170 | .171 | .173 | .174 | .175 | .176 | .178 |
| 100.0 | .167 | .169 | .170 | .171 | .172 | .174 | .175 | .176 | .178 | .179 |

Table 46.

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 28.0 | 28.2 | 28.4 | 28.6 | 28.8 | 29.0 | 29.2 | 29.4 | 29.6 | 29.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 0°.0 | +0.073 | +0.074 | +0.074 | +0.075 | +0.075 | +0.076 | +0.076 | +0.077 | +0.077 | +0.078 |
| +0.5 | +0.072 | +0.072 | +0.073 | +0.073 | +0.074 | +0.074 | +0.075 | +0.075 | +0.076 | +0.076 |
| 1.0 | .070 | .071 | .071 | .072 | .072 | .073 | .073 | .074 | .074 | .075 |
| 1.5 | .069 | .070 | .070 | .071 | .071 | .072 | .072 | .073 | .073 | .074 |
| 2.0 | .068 | .068 | .069 | .069 | .070 | .070 | .071 | .071 | .072 | .072 |
| 2.5 | .067 | .067 | .068 | .068 | .069 | .069 | .069 | .070 | .070 | .071 |
| 3.0 | +0.065 | +0.066 | +0.066 | +0.067 | +0.067 | +0.068 | +0.068 | +0.069 | +0.069 | +0.070 |
| 3.5 | .064 | .065 | .065 | .065 | .066 | .066 | .067 | .067 | .068 | .068 |
| 4.0 | .063 | .063 | .064 | .064 | .065 | .065 | .065 | .066 | .066 | .067 |
| 4.5 | .062 | .062 | .062 | .063 | .063 | .064 | .064 | .065 | .065 | .065 |
| 5.0 | .060 | .061 | .061 | .062 | .062 | .062 | .063 | .063 | .064 | .064 |
| 5.5 | +0.059 | +0.059 | +0.060 | +0.060 | +0.061 | +0.061 | +0.062 | +0.062 | +0.062 | +0.063 |
| 6.0 | .058 | .058 | .059 | .059 | .059 | .060 | .060 | .061 | .061 | .061 |
| 6.5 | .056 | .057 | .057 | .058 | .058 | .058 | .059 | .059 | .060 | .060 |
| 7.0 | .055 | .056 | .056 | .056 | .057 | .057 | .057 | .058 | .058 | .059 |
| 7.5 | .054 | .054 | .055 | .055 | .055 | .056 | .056 | .057 | .057 | .057 |
| 8.0 | +0.053 | +0.053 | +0.053 | +0.054 | +0.054 | +0.054 | +0.055 | +0.055 | +0.056 | +0.056 |
| 8.5 | .051 | .052 | .052 | .052 | .053 | .053 | .053 | .054 | .054 | .055 |
| 9.0 | .050 | .050 | .051 | .051 | .051 | .052 | .052 | .053 | .053 | .053 |
| 9.5 | .049 | .049 | .049 | .050 | .050 | .050 | .051 | .051 | .052 | .052 |
| 10.0 | .047 | .048 | .048 | .048 | .049 | .049 | .050 | .050 | .050 | .051 |
| 10.5 | +0.046 | +0.047 | +0.047 | +0.047 | +0.048 | +0.048 | +0.048 | +0.049 | +0.049 | +0.049 |
| 11.0 | .045 | .045 | .046 | .046 | .046 | .047 | .047 | .047 | .047 | .048 |
| 11.5 | .044 | .044 | .044 | .045 | .045 | .045 | .046 | .046 | .046 | .046 |
| 12.0 | .042 | .043 | .043 | .043 | .044 | .044 | .044 | .044 | .045 | .045 |
| 12.5 | .041 | .041 | .042 | .042 | .042 | .043 | .043 | .043 | .043 | .044 |
| 13.0 | +0.040 | +0.040 | +0.040 | +0.041 | +0.041 | +0.041 | +0.042 | +0.042 | +0.042 | +0.042 |
| 13.5 | .039 | .039 | .039 | .039 | .040 | .040 | .040 | .040 | .041 | .041 |
| 14.0 | .037 | .038 | .038 | .038 | .038 | .039 | .039 | .039 | .039 | .040 |
| 14.5 | .036 | .036 | .037 | .037 | .037 | .037 | .038 | .038 | .038 | .038 |
| 15.0 | .035 | .035 | .035 | .035 | .036 | .036 | .036 | .036 | .037 | .037 |
| 15.5 | +0.033 | +0.034 | +0.034 | +0.034 | +0.034 | +0.035 | +0.035 | +0.035 | +0.035 | +0.036 |
| 16.0 | .032 | .032 | .033 | .033 | .033 | .033 | .034 | .034 | .034 | .034 |
| 16.5 | .031 | .031 | .031 | .032 | .032 | .032 | .032 | .032 | .033 | .033 |
| 17.0 | .030 | .030 | .030 | .030 | .030 | .031 | .031 | .031 | .031 | .032 |
| 17.5 | .028 | .029 | .029 | .029 | .029 | .029 | .030 | .030 | .030 | .030 |
| 18.0 | +0.027 | +0.027 | +0.027 | +0.028 | +0.028 | +0.028 | +0.028 | +0.028 | +0.029 | +0.029 |
| 18.5 | .026 | .026 | .026 | .026 | .027 | .027 | .027 | .027 | .027 | .027 |
| 19.0 | .025 | .025 | .025 | .025 | .025 | .025 | .026 | .026 | .026 | .026 |
| 19.5 | .023 | .023 | .024 | .024 | .024 | .024 | .024 | .024 | .025 | .025 |
| 20.0 | .022 | .022 | .022 | .022 | .023 | .023 | .023 | .023 | .023 | .023 |
| 20.5 | +0.021 | +0.021 | +0.021 | +0.021 | +0.021 | +0.021 | +0.022 | +0.022 | +0.022 | +0.022 |
| 21.0 | .019 | .020 | .020 | .020 | .020 | .020 | .020 | .020 | .021 | .021 |
| 21.5 | .018 | .018 | .018 | .019 | .019 | .019 | .019 | .019 | .019 | .019 |
| 22.0 | .017 | .017 | .017 | .017 | .017 | .017 | .018 | .018 | .018 | .018 |
| 22.5 | .016 | .016 | .016 | .016 | .016 | .016 | .016 | .016 | .016 | .017 |
| 23.0 | +0.014 | +0.014 | +0.015 | +0.015 | +0.015 | +0.015 | +0.015 | +0.015 | +0.015 | +0.015 |
| 23.5 | .013 | .013 | .013 | .013 | .013 | .014 | .014 | .014 | .014 | .014 |
| 24.0 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .012 | .013 |
| 24.5 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 |
| 25.0 | .009 | .009 | .009 | .009 | .009 | .010 | .010 | .010 | .010 | .010 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 28.0 | 28.2 | 28.4 | 28.6 | 28.8 | 29.0 | 29.2 | 29.4 | 29.6 | 29.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| **25°.5** | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 | +0.008 |
| 26.0 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 |
| 26.5 | .005 | .005 | .005 | .006 | .006 | .006 | .006 | .006 | .006 | .006 |
| 27.0 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 |
| 27.5 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| **28.0** | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 |
| 28.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29.0 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |
| 29.5 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| 30.0 | .003 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 |
| **30.5** | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 |
| 31.0 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 |
| 31.5 | .007 | .007 | .007 | .007 | .008 | .008 | .008 | .008 | .008 | .008 |
| 32.0 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .009 |
| 32.5 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .010 |
| **33.0** | −0.011 | −0.011 | −0.011 | −0.011 | −0.011 | −0.012 | −0.012 | −0.012 | −0.012 | −0.012 |
| 33.5 | .012 | .012 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .013 |
| 34.0 | .014 | .014 | .014 | .014 | .014 | .014 | .014 | .014 | .014 | .015 |
| 34.5 | .015 | .015 | .015 | .015 | .015 | .015 | .016 | .016 | .016 | .016 |
| 35.0 | .016 | .016 | .016 | .017 | .017 | .017 | .017 | .017 | .017 | .017 |
| **35.5** | −0.017 | −0.018 | −0.018 | −0.018 | −0.018 | −0.018 | −0.018 | −0.018 | −0.018 | −0.019 |
| 36.0 | .019 | .019 | .019 | .019 | .019 | .019 | .020 | .020 | .020 | .020 |
| 36.5 | .020 | .020 | .020 | .020 | .021 | .021 | .021 | .021 | .021 | .021 |
| 37.0 | .021 | .021 | .022 | .022 | .022 | .022 | .022 | .022 | .022 | .023 |
| 37.5 | .023 | .023 | .023 | .023 | .023 | .023 | .024 | .024 | .024 | .024 |
| **38.0** | −0.024 | −0.024 | −0.024 | −0.024 | −0.024 | −0.025 | −0.025 | −0.025 | −0.025 | −0.025 |
| 38.5 | .025 | .025 | .025 | .026 | .026 | .026 | .026 | .026 | .027 | .027 |
| 39.0 | .026 | .027 | .027 | .027 | .027 | .027 | .027 | .028 | .028 | .028 |
| 39.5 | .028 | .028 | .028 | .028 | .028 | .029 | .029 | .029 | .029 | .029 |
| 40.0 | .029 | .029 | .029 | .030 | .030 | .030 | .030 | .030 | .031 | .031 |
| **40.5** | −0.030 | −0.030 | −0.031 | −0.031 | −0.031 | −0.031 | −0.031 | −0.032 | −0.032 | −0.032 |
| 41.0 | .031 | .032 | .032 | .032 | .032 | .033 | .033 | .033 | .033 | .033 |
| 41.5 | .033 | .033 | .033 | .033 | .034 | .034 | .034 | .034 | .035 | .035 |
| 42.0 | .034 | .034 | .034 | .035 | .035 | .035 | .035 | .036 | .036 | .036 |
| 42.5 | .035 | .035 | .036 | .036 | .036 | .036 | .037 | .037 | .037 | .037 |
| **43.0** | −0.036 | −0.037 | −0.037 | −0.037 | −0.038 | −0.038 | −0.038 | −0.038 | −0.039 | −0.039 |
| 43.5 | .038 | .038 | .038 | .039 | .039 | .039 | .039 | .040 | .040 | .040 |
| 44.0 | .039 | .039 | .040 | .040 | .040 | .040 | .041 | .041 | .041 | .042 |
| 44.5 | .040 | .041 | .041 | .041 | .041 | .042 | .042 | .042 | .043 | .043 |
| 45.0 | .042 | .042 | .042 | .042 | .043 | .043 | .043 | .044 | .044 | .044 |
| **45.5** | −0.043 | −0.043 | −0.043 | −0.044 | −0.044 | −0.044 | −0.045 | −0.045 | −0.045 | −0.046 |
| 46.0 | .044 | .044 | .045 | .045 | .045 | .046 | .046 | .046 | .047 | .047 |
| 46.5 | .045 | .046 | .046 | .046 | .047 | .047 | .047 | .048 | .048 | .048 |
| 47.0 | .047 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .049 | .050 |
| 47.5 | .048 | .048 | .049 | .049 | .049 | .050 | .050 | .050 | .051 | .051 |
| **48.0** | −0.049 | −0.050 | −0.050 | −0.050 | −0.051 | −0.051 | −0.051 | −0.052 | −0.052 | −0.052 |
| 48.5 | .050 | .051 | .051 | .052 | .052 | .052 | .053 | .053 | .053 | .054 |
| 49.0 | .052 | .052 | .052 | .053 | .053 | .054 | .054 | .054 | .055 | .055 |
| 49.5 | .053 | .053 | .054 | .054 | .054 | .055 | .055 | .056 | .056 | .056 |
| 50.0 | .054 | .055 | .055 | .055 | .056 | .056 | .057 | .057 | .057 | .058 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 28.0 | 28.2 | 28.4 | 28.6 | 28.8 | 29.0 | 29.2 | 29.4 | 29.6 | 29.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 50°.5 | −0.055 | −0.056 | −0.056 | −0.057 | −0.057 | −0.057 | −0.058 | −0.058 | −0.059 | −0.059 |
| 51.0 | .057 | .057 | .058 | .058 | .058 | .059 | .059 | .060 | .060 | .060 |
| 51.5 | .058 | .058 | .059 | .059 | .060 | .060 | .061 | .061 | .061 | .062 |
| 52.0 | .059 | .060 | .060 | .061 | .061 | .061 | .062 | .062 | .063 | .063 |
| 52.5 | .061 | .061 | .061 | .062 | .062 | .063 | .063 | .064 | .064 | .064 |
| 53.0 | −0.062 | −0.062 | −0.063 | −0.063 | −0.064 | −0.064 | −0.064 | −0.065 | −0.065 | −0.066 |
| 53.5 | .063 | .064 | .064 | .064 | .065 | .065 | .066 | .066 | .067 | .067 |
| 54.0 | .064 | .065 | .065 | .066 | .066 | .067 | .067 | .068 | .068 | .068 |
| 54.5 | .066 | .066 | .067 | .067 | .067 | .068 | .068 | .069 | .069 | .070 |
| 55.0 | .067 | .067 | .068 | .068 | .069 | .069 | .070 | .070 | .071 | .071 |
| 55.5 | −0.068 | −0.069 | −0.069 | −0.070 | −0.070 | −0.071 | −0.071 | −0.072 | −0.072 | −0.073 |
| 56.0 | .069 | .070 | .070 | .071 | .071 | .072 | .072 | .073 | .073 | .074 |
| 56.5 | .071 | .071 | .072 | .072 | .073 | .073 | .074 | .074 | .075 | .075 |
| 57.0 | .072 | .072 | .073 | .073 | .074 | .075 | .075 | .076 | .076 | .077 |
| 57.5 | .073 | .074 | .074 | .075 | .075 | .076 | .076 | .077 | .077 | .078 |
| 58.0 | −0.074 | −0.075 | −0.076 | −0.076 | −0.077 | −0.077 | −0.078 | −0.078 | −0.079 | −0.079 |
| 58.5 | .076 | .076 | .077 | .077 | .078 | .078 | .079 | .080 | .080 | .081 |
| 59.0 | .077 | .078 | .078 | .079 | .079 | .080 | .080 | .081 | .081 | .082 |
| 59.5 | .078 | .079 | .079 | .080 | .081 | .081 | .082 | .082 | .083 | .083 |
| 60.0 | .080 | .080 | .081 | .081 | .082 | .082 | .083 | .084 | .084 | .085 |
| 60.5 | −0.081 | −0.081 | −0.082 | −0.083 | −0.083 | −0.084 | −0.084 | −0.085 | −0.085 | −0.086 |
| 61.0 | .082 | .083 | .083 | .084 | .084 | .085 | .086 | .086 | .087 | .087 |
| 61.5 | .083 | .084 | .085 | .085 | .086 | .086 | .087 | .087 | .088 | .089 |
| 62.0 | .085 | .085 | .086 | .086 | .087 | .088 | .088 | .089 | .089 | .090 |
| 62.5 | .086 | .086 | .087 | .088 | .088 | .089 | .090 | .090 | .091 | .091 |
| 63.0 | −0.087 | −0.088 | −0.088 | −0.089 | −0.090 | −0.090 | −0.091 | −0.091 | −0.092 | −0.093 |
| 63.5 | .088 | .089 | .090 | .090 | .091 | .092 | .092 | .093 | .093 | .094 |
| 64.0 | .090 | .090 | .091 | .092 | .092 | .093 | .093 | .094 | .095 | .095 |
| 64.5 | .091 | .092 | .092 | .093 | .093 | .094 | .095 | .095 | .096 | .097 |
| 65.0 | .092 | .093 | .093 | .094 | .095 | .095 | .096 | .097 | .097 | .098 |
| 65.5 | −0.093 | −0.094 | −0.095 | −0.095 | −0.096 | −0.097 | −0.097 | −0.098 | −0.099 | −0.099 |
| 66.0 | .095 | .095 | .096 | .097 | .097 | .098 | .099 | .099 | .100 | .101 |
| 66.5 | .096 | .097 | .097 | .098 | .099 | .099 | .100 | .101 | .101 | .102 |
| 67.0 | .097 | .098 | .099 | .099 | .100 | .101 | .101 | .102 | .103 | .103 |
| 67.5 | .098 | .099 | .100 | .101 | .101 | .102 | .103 | .103 | .104 | .105 |
| 68.0 | −0.100 | −0.100 | −0.101 | −0.102 | −0.103 | −0.103 | −0.104 | −0.105 | −0.105 | −0.106 |
| 68.5 | .101 | .102 | .102 | .103 | .104 | .105 | .105 | .106 | .107 | .107 |
| 69.0 | .102 | .103 | .104 | .104 | .105 | .106 | .107 | .107 | .108 | .109 |
| 69.5 | .104 | .104 | .105 | .106 | .106 | .107 | .108 | .109 | .109 | .110 |
| 70.0 | .105 | .106 | .106 | .107 | .108 | .109 | .109 | .110 | .111 | .112 |
| 70.5 | −0.106 | −0.107 | −0.108 | −0.108 | −0.109 | −0.110 | −0.111 | −0.111 | −0.112 | −0.113 |
| 71.0 | .107 | .108 | .109 | .110 | .110 | .111 | .112 | .113 | .113 | .114 |
| 71.5 | .109 | .109 | .110 | .111 | .112 | .112 | .113 | .114 | .115 | .116 |
| 72.0 | .110 | .111 | .111 | .112 | .113 | .114 | .115 | .115 | .116 | .117 |
| 72.5 | .111 | .112 | .113 | .113 | .114 | .115 | .116 | .117 | .117 | .118 |
| 73.0 | −0.112 | −0.113 | −0.114 | −0.115 | −0.116 | −0.116 | −0.117 | −0.118 | −0.119 | −0.120 |
| 73.5 | .114 | .114 | .115 | .116 | .117 | .118 | .118 | .119 | .120 | .121 |
| 74.0 | .115 | .116 | .117 | .117 | .118 | .119 | .120 | .121 | .121 | .122 |
| 74.5 | .116 | .117 | .118 | .119 | .119 | .120 | .121 | .122 | .123 | .124 |
| 75.0 | .117 | .118 | .119 | .120 | .121 | .122 | .122 | .123 | .124 | .125 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Ther-mometer Fahren-heit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 28.0 | 28.2 | 28.4 | 28 6 | 28 8 | 29.0 | 29.2 | 29.4 | 29.6 | 29.8 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| **75°.5** | −0.119 | −0.119 | −0.120 | −0.121 | −0.122 | −0.123 | −0.124 | −0.125 | −0.125 | −0.126 |
| 76.0 | .120 | .121 | .122 | .122 | .123 | .124 | .125 | .126 | .127 | .128 |
| 76.5 | .121 | .122 | .123 | .124 | .125 | .125 | .126 | .127 | .128 | .129 |
| 77.0 | .122 | .123 | .124 | .125 | .126 | .127 | .128 | .129 | .129 | .130 |
| 77.5 | .124 | .125 | .125 | .126 | .127 | .128 | .129 | .130 | .131 | .132 |
| **78.0** | −0.125 | −0.126 | −0.127 | −0.128 | −0.129 | −0.129 | −0.130 | −0.131 | −0.132 | −0.133 |
| 78.5 | .126 | .127 | .128 | .129 | .130 | .131 | .132 | .133 | .133 | .134 |
| 79.0 | .127 | .128 | .129 | .130 | .131 | .132 | .133 | .134 | .135 | .136 |
| 79.5 | .129 | .130 | .131 | .131 | .132 | .133 | .134 | .135 | .136 | .137 |
| 80.0 | .130 | .131 | .132 | .133 | .134 | .135 | .136 | .136 | .137 | .138 |
| **80.5** | −0.131 | −0.132 | −0.133 | −0.134 | −0.135 | −0.136 | −0.137 | −0.138 | −0.139 | −0.140 |
| 81.0 | .132 | .133 | .134 | .135 | .136 | .137 | .138 | .139 | .140 | .141 |
| 81.5 | .134 | .135 | .136 | .137 | .138 | .139 | .139 | .140 | .141 | .142 |
| 82.0 | .135 | .136 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .144 |
| 82.5 | .136 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .144 | .145 |
| **83.0** | −0.138 | −0.139 | −0.139 | −0.140 | −0.141 | −0.142 | −0.143 | −0.144 | −0.145 | −0.146 |
| 83.5 | .139 | .140 | .141 | .142 | .143 | .144 | .145 | .146 | .147 | .148 |
| 84.0 | .140 | .141 | .142 | .143 | .144 | .145 | .146 | .147 | .148 | .149 |
| 84.5 | .141 | .142 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .150 |
| 85.0 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .150 | .151 | .152 |
| **85.5** | −0.144 | −0.145 | −0.146 | −0.147 | −0.148 | −0.149 | −0.150 | −0.151 | −0.152 | −0.153 |
| 86.0 | .145 | .146 | .147 | .148 | .149 | .150 | .151 | .152 | .153 | .154 |
| 86.5 | .146 | .147 | .148 | .149 | .151 | .152 | .153 | .154 | .155 | .156 |
| 87.0 | .148 | .149 | .150 | .151 | .152 | .153 | .154 | .155 | .156 | .157 |
| 87.5 | .149 | .150 | .151 | .152 | .153 | .154 | .155 | .156 | .157 | .158 |
| **88.0** | −0.150 | −0.151 | −0.152 | −0.153 | −0.154 | −0.155 | −0.157 | −0.158 | −0.159 | −0.160 |
| 88.5 | .151 | .152 | .154 | .155 | .156 | .157 | .158 | .159 | .160 | .161 |
| 89.0 | .153 | .154 | .155 | .156 | .157 | .158 | .159 | .160 | .161 | .162 |
| 89.5 | .154 | .155 | .156 | .157 | .158 | .159 | .160 | .162 | .163 | .164 |
| 90.0 | .155 | .156 | .157 | .158 | .160 | .161 | .162 | .163 | .164 | .165 |
| **90.5** | −0.156 | −0.157 | −0.159 | −0.160 | −0.161 | −0.162 | −0.163 | −0.164 | −0.165 | −0.166 |
| 91.0 | .158 | .159 | .160 | .161 | .162 | .163 | .164 | .166 | .167 | .168 |
| 91.5 | .159 | .160 | .161 | .162 | .163 | .165 | .166 | .167 | .168 | .169 |
| 92.0 | .160 | .161 | .162 | .164 | .165 | .166 | .167 | .168 | .169 | .170 |
| 92.5 | .161 | .163 | .164 | .165 | .166 | .167 | .168 | .169 | .171 | .172 |
| **93.0** | −0.163 | −0.164 | −0.165 | −0.166 | −0.167 | −0.168 | −0.170 | −0.171 | −0.172 | −0.173 |
| 93.5 | .164 | .165 | .166 | .167 | .169 | .170 | .171 | .172 | .173 | .174 |
| 94.0 | .165 | .166 | .168 | .169 | .170 | .171 | .172 | .173 | .175 | .176 |
| 94.5 | .166 | .168 | .169 | .170 | .171 | .172 | .174 | .175 | .176 | .177 |
| 95.0 | .168 | .169 | .170 | .171 | .172 | .174 | .175 | .176 | .177 | .178 |
| **95.5** | −0.169 | −0.170 | −0.171 | −0.173 | −0.174 | −0.175 | −0.176 | −0.177 | −0.179 | −0.180 |
| 96.0 | .170 | .171 | .173 | .174 | .175 | .176 | .177 | .179 | .180 | .181 |
| 96.5 | .171 | .173 | .174 | .175 | .176 | .178 | .179 | .180 | .181 | .182 |
| 97.0 | .173 | .174 | .175 | .176 | .178 | .179 | .180 | .181 | .183 | .184 |
| 97.5 | .174 | .175 | .176 | .178 | .179 | .180 | .181 | .183 | .184 | .185 |
| **98.0** | −0.175 | −0.176 | −0.178 | −0.179 | −0.180 | −0.181 | −0.183 | −0.184 | −0.185 | −0.186 |
| 98.5 | .176 | .178 | .179 | .180 | .181 | .183 | .184 | .185 | .187 | .188 |
| 99.0 | .178 | .179 | .180 | .182 | .183 | .184 | .185 | .187 | .188 | .189 |
| 99.5 | .179 | .180 | .182 | .183 | .184 | .185 | .187 | .188 | .189 | .190 |
| 100.0 | .180 | .182 | .183 | .184 | .185 | .187 | .188 | .189 | .191 | .192 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 29.8 | 30.0 | 30.2 | 30.4 | 30.6 | 30.8 | 31.0 | 31.2 | 31.4 | 31.6 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 0°.0 | +0.078 | +0.078 | +0.079 | +0.079 | +0.080 | +0.080 | +0.081 | +0.081 | +0.082 | +0.082 |
| 0.5 | +0.076 | +0.077 | +0.077 | +0.078 | +0.078 | +0.079 | +0.079 | +0.080 | +0.080 | +0.081 |
| 1.0 | .075 | .076 | .076 | .077 | .077 | .078 | .078 | .079 | .079 | .080 |
| 1.5 | .074 | .074 | .075 | .075 | .076 | .076 | .077 | .077 | .078 | .078 |
| 2.0 | .072 | .073 | .073 | .074 | .074 | .075 | .075 | .076 | .076 | .077 |
| 2.5 | .071 | .071 | .072 | .072 | .073 | .073 | .074 | .074 | .075 | .075 |
| 3.0 | +0.070 | +0.070 | +0.070 | +0.071 | +0.071 | +0.072 | +0.072 | +0.073 | +0.073 | +0.074 |
| 3.5 | .068 | .069 | .069 | .070 | .070 | .070 | .071 | .071 | .072 | .072 |
| 4.0 | .067 | .067 | .068 | .068 | .069 | .069 | .070 | .070 | .070 | .071 |
| 4.5 | .065 | .066 | .066 | .067 | .067 | .068 | .068 | .069 | .069 | .069 |
| 5.0 | .064 | .065 | .065 | .065 | .066 | .066 | .067 | .067 | .068 | .068 |
| 5.5 | +0.063 | +0.063 | +0.064 | +0.064 | +0.064 | +0.065 | +0.065 | +0.066 | +0.066 | +0.067 |
| 6.0 | .061 | .062 | .062 | .063 | .063 | .063 | .064 | .064 | .065 | .065 |
| 6.5 | .060 | .060 | .061 | .061 | .062 | .062 | .062 | .063 | .063 | .064 |
| 7.0 | .059 | .059 | .059 | .060 | .060 | .061 | .061 | .061 | .062 | .062 |
| 7.5 | .057 | .058 | .058 | .058 | .059 | .059 | .060 | .060 | .060 | .061 |
| 8.0 | +0.056 | +0.056 | +0.057 | +0.057 | +0.057 | +0.058 | +0.058 | +0.059 | +0.059 | +0.059 |
| 8.5 | .055 | .055 | .055 | .056 | .056 | .056 | .057 | .057 | .058 | .058 |
| 9.0 | .053 | .054 | .054 | .054 | .055 | .055 | .055 | .056 | .056 | .056 |
| 9.5 | .052 | .052 | .053 | .053 | .053 | .054 | .054 | .054 | .055 | .055 |
| 10.0 | .051 | .051 | .051 | .052 | .052 | .052 | .053 | .053 | .053 | .054 |
| 10.5 | +0.049 | +0.049 | +0.050 | +0.050 | +0.050 | +0.051 | +0.051 | +0.051 | +0.052 | +0.052 |
| 11.0 | .048 | .048 | .048 | .049 | .049 | .049 | .050 | .050 | .050 | .051 |
| 11.5 | .046 | .047 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .049 |
| 12.0 | .045 | .045 | .046 | .046 | .046 | .047 | .047 | .047 | .048 | .048 |
| 12.5 | .044 | .044 | .044 | .045 | .045 | .045 | .045 | .046 | .046 | .046 |
| 13.0 | +0.042 | +0.043 | +0.043 | +0.043 | +0.044 | +0.044 | +0.044 | +0.044 | +0.045 | +0.045 |
| 13.5 | .041 | .041 | .042 | .042 | .042 | .042 | .043 | .043 | .043 | .043 |
| 14.0 | .040 | .040 | .040 | .040 | .041 | .041 | .041 | .042 | .042 | .042 |
| 14.5 | .038 | .039 | .039 | .039 | .039 | .040 | .040 | .040 | .040 | .041 |
| 15.0 | .037 | .037 | .037 | .038 | .038 | .038 | .038 | .039 | .039 | .039 |
| 15.5 | +0.036 | +0.036 | +0.036 | +0.036 | +0.037 | +0.037 | +0.037 | +0.037 | +0.037 | +0.038 |
| 16.0 | .034 | .034 | .035 | .035 | .035 | .035 | .036 | .036 | .036 | .036 |
| 16.5 | .033 | .033 | .033 | .034 | .034 | .034 | .034 | .034 | .035 | .035 |
| 17.0 | .032 | .032 | .032 | .032 | .032 | .033 | .033 | .033 | .033 | .033 |
| 17.5 | .030 | .030 | .031 | .031 | .031 | .031 | .031 | .032 | .032 | .032 |
| 18.0 | +0.029 | +0.029 | +0.029 | +0.029 | +0.030 | +0.030 | +0.030 | +0.030 | +0.030 | +0.031 |
| 18.5 | .027 | .028 | .028 | .028 | .028 | .028 | .029 | .029 | .029 | .029 |
| 19.0 | .026 | .026 | .026 | .027 | .027 | .027 | .027 | .027 | .027 | .028 |
| 19.5 | .025 | .025 | .025 | .025 | .025 | .026 | .026 | .026 | .026 | .026 |
| 20.0 | .023 | .024 | .024 | .024 | .024 | .024 | .024 | .024 | .025 | .025 |
| 20.5 | +0.022 | +0.022 | +0.022 | +0.022 | +0.023 | +0.023 | +0.023 | +0.023 | +0.023 | +0.023 |
| 21.0 | .021 | .021 | .021 | .021 | .021 | .021 | .022 | .022 | .022 | .022 |
| 21.5 | .019 | .019 | .020 | .020 | .020 | .020 | .020 | .020 | .020 | .020 |
| 22.0 | .018 | .018 | .018 | .018 | .018 | .019 | .019 | .019 | .019 | .019 |
| 22.5 | .017 | .017 | .017 | .017 | .017 | .017 | .017 | .017 | .017 | .018 |
| 23.0 | +0.015 | +0.015 | +0.015 | +0.016 | +0.016 | +0.016 | +0.016 | +0.016 | +0.016 | +0.016 |
| 23.5 | .014 | .014 | .014 | .014 | .014 | .014 | .014 | .015 | .015 | .015 |
| 24.0 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .013 | .013 |
| 24.5 | .011 | .011 | .011 | .011 | .011 | .012 | .012 | .012 | .012 | .012 |
| 25.0 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | .010 | 0.10 | .010 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 29.8 | 30.0 | 30.2 | 30.4 | 30.6 | 30.8 | 31.0 | 31.2 | 31.4 | 31.6 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 25°.5 | +0.008 | +0.009 | +0.009 | +0.009 | +0.009 | +0.009 | +0.009 | +0.009 | +0.009 | +0.009 |
| 26.0 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .007 | .008 | .008 |
| 26.5 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 | .006 |
| 27.0 | .004 | .004 | .004 | .005 | .005 | .005 | .005 | .005 | .005 | .005 |
| 27.5 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 | .003 |
| 28.0 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 | +0.002 |
| 28.5 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| 29.0 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |
| 29.5 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| 30.0 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 | .004 |
| 30.5 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 | −0.005 |
| 31.0 | .006 | .006 | .006 | .007 | .007 | .007 | .007 | .007 | .007 | .007 |
| 31.5 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 | .008 |
| 32.0 | .009 | .009 | .009 | .009 | .009 | .009 | .009 | .010 | .010 | .010 |
| 32.5 | .010 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 | .011 |
| 33.0 | −0.012 | −0.012 | −0.012 | −0.012 | −0.012 | −0.012 | −0.012 | −0.012 | −0.012 | −0.013 |
| 33.5 | .013 | .013 | .013 | .013 | .014 | .014 | .014 | .014 | .014 | .014 |
| 34.0 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 | .015 |
| 34.5 | .016 | .016 | .016 | .016 | .016 | .016 | .017 | .017 | .017 | .017 |
| 35.0 | .017 | .017 | .017 | .018 | .018 | .018 | .018 | .018 | .018 | .018 |
| 35.5 | −0.019 | −0.019 | −0.019 | −0.019 | −0.019 | −0.019 | −0.019 | −0.019 | −0.020 | −0.020 |
| 36.0 | .020 | .020 | .020 | .020 | .020 | .021 | .021 | .021 | .021 | .021 |
| 36.5 | .021 | .021 | .022 | .022 | .022 | .022 | .022 | .022 | .022 | .023 |
| 37.0 | .023 | .023 | .023 | .023 | .023 | .023 | .024 | .024 | .024 | .024 |
| 37.5 | .024 | .024 | .024 | .024 | .025 | .025 | .025 | .025 | .025 | .025 |
| 38.0 | −0.025 | −0.026 | −0.026 | −0.026 | −0.026 | −0.026 | −0.026 | −0.027 | −0.027 | −0.027 |
| 38.5 | .027 | .027 | .027 | .027 | .027 | .028 | .028 | .028 | .028 | .028 |
| 39.0 | .028 | .028 | .028 | .029 | .029 | .029 | .029 | .029 | .030 | .030 |
| 39.5 | .029 | .030 | .030 | .030 | .030 | .030 | .031 | .031 | .031 | .031 |
| 40.0 | .031 | .031 | .031 | .031 | .032 | .032 | .032 | .032 | .032 | .033 |
| 40.5 | −0.032 | −0.032 | −0.033 | −0.033 | −0.033 | −0.033 | −0.033 | −0.034 | −0.034 | −0.034 |
| 41.0 | .033 | .034 | .034 | .034 | .034 | .035 | .035 | .035 | .035 | .035 |
| 41.5 | .035 | .035 | .035 | .035 | .036 | .036 | .036 | .036 | .037 | .037 |
| 42.0 | .036 | .036 | .037 | .037 | .037 | .037 | .038 | .038 | .038 | .038 |
| 42.5 | .037 | .038 | .038 | .038 | .038 | .039 | .039 | .039 | .040 | .040 |
| 43.0 | −0.039 | −0.039 | −0.039 | −0.040 | −0.040 | −0.040 | −0.040 | −0.041 | −0.041 | −0.041 |
| 43.5 | .040 | .040 | .041 | .041 | .041 | .042 | .042 | .042 | .042 | .043 |
| 44.0 | .042 | .042 | .042 | .042 | .043 | .043 | .043 | .043 | .044 | .044 |
| 44.5 | .043 | .043 | .043 | .044 | .044 | .044 | .045 | .045 | .045 | .045 |
| 45.0 | .044 | .045 | .045 | .045 | .045 | .046 | .046 | .046 | .047 | .047 |
| 45.5 | −0.046 | −0.046 | −0.046 | −0.047 | −0.047 | −0.047 | −0.047 | −0.048 | −0.048 | −0.048 |
| 46.0 | .047 | .047 | .048 | .048 | .048 | .049 | .049 | .049 | .049 | .050 |
| 46.5 | .048 | .049 | .049 | .049 | .050 | .050 | .050 | .051 | .051 | .051 |
| 47.0 | .050 | .050 | .050 | .051 | .051 | .051 | .052 | .052 | .052 | .053 |
| 47.5 | .051 | .051 | .052 | .052 | .052 | .053 | .053 | .053 | .054 | .054 |
| 48.0 | −0.052 | −0.053 | −0.053 | −0.053 | −0.054 | −0.054 | −0.054 | −0.055 | −0.055 | −0.055 |
| 48.5 | .054 | .054 | .054 | .055 | .055 | .055 | .056 | .056 | .057 | .057 |
| 49.0 | .055 | .055 | .056 | .056 | .057 | .057 | .057 | .058 | .058 | .058 |
| 49.5 | .056 | .057 | .057 | .058 | .058 | .058 | .059 | .059 | .059 | .060 |
| 50.0 | .058 | .058 | .058 | .059 | .059 | .060 | .060 | .060 | .061 | .061 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### ENGLISH MEASURES.

| Attached Thermometer Fahrenheit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 29.8 | 30.0 | 30.2 | 30.4 | 30.6 | 30.8 | 31.0 | 31.2 | 31.4 | 31.6 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 50°.5 | −0.059 | −0.059 | −0.060 | −0.060 | −0.061 | −0.061 | −0.061 | −0.062 | −0.062 | −0.063 |
| 51.0 | .060 | .061 | .061 | .062 | .062 | .062 | .063 | .063 | .064 | .064 |
| 51.5 | .062 | .062 | .063 | .063 | .063 | .064 | .064 | .065 | .065 | .065 |
| 52.0 | .063 | .064 | .064 | .064 | .065 | .065 | .066 | .066 | .066 | .067 |
| 52.5 | .064 | .065 | .065 | .066 | .066 | .067 | .067 | .067 | .068 | .068 |
| 53.0 | −0.066 | −0.066 | −0.067 | −0.067 | −0.068 | −0.068 | −0.068 | −0.069 | −0.069 | −0.070 |
| 53.5 | .067 | .068 | .068 | .069 | .069 | .069 | .070 | .070 | .071 | .071 |
| 54.0 | .068 | .069 | .069 | .070 | .070 | .071 | .071 | .072 | .072 | .073 |
| 54.5 | .070 | .070 | .071 | .071 | .072 | .072 | .073 | .073 | .074 | .074 |
| 55.0 | .071 | .072 | .072 | .073 | .073 | .074 | .074 | .075 | .075 | .075 |
| 55.5 | −0.073 | −0.073 | −0.074 | −0.074 | −0.074 | −0.075 | −0.075 | −0.076 | −0.076 | −0.077 |
| 56.0 | .074 | .074 | .075 | .075 | .076 | .076 | .077 | .077 | .078 | .078 |
| 56.5 | .075 | .076 | .076 | .077 | .077 | .078 | .078 | .079 | .079 | .080 |
| 57.0 | .077 | .077 | .078 | .078 | .079 | .079 | .080 | .080 | .081 | .081 |
| 57.5 | .078 | .078 | .079 | .079 | .080 | .081 | .081 | .082 | .082 | .083 |
| 58.0 | −0.079 | −0.080 | −0.080 | −0.081 | −0.081 | −0.082 | −0.082 | −0.083 | −0.084 | −0.084 |
| 58.5 | .081 | .081 | .082 | .082 | .083 | .083 | .084 | .084 | .085 | .085 |
| 59.0 | .082 | .083 | .083 | .084 | .084 | .085 | .085 | .086 | .086 | .087 |
| 59.5 | .083 | .084 | .084 | .085 | .086 | .086 | .087 | .087 | .088 | .088 |
| 60.0 | .085 | .085 | .086 | .086 | .087 | .087 | .088 | .089 | .089 | .090 |
| 60.5 | −0.086 | −0.087 | −0.087 | −0.088 | −0.088 | −0.089 | −0.089 | −0.090 | −0.091 | −0.091 |
| 61.0 | .087 | .088 | .089 | .089 | .090 | .090 | .091 | .091 | .092 | .093 |
| 61.5 | .089 | .089 | .090 | .090 | .091 | .092 | .092 | .093 | .093 | .094 |
| 62.0 | .090 | .091 | .091 | .092 | .092 | .093 | .094 | .094 | .095 | .095 |
| 62.5 | .091 | .092 | .093 | .093 | .094 | .094 | .095 | .096 | .096 | .097 |
| 63.0 | −0.093 | −0.093 | −0.094 | −0.095 | −0.095 | −0.096 | −0.096 | −0.097 | −0.098 | −0.098 |
| 63.5 | .094 | .095 | .095 | .096 | .097 | .097 | .098 | .098 | .099 | .100 |
| 64.0 | .095 | .096 | .097 | .097 | .098 | .099 | .099 | .100 | .101 | .101 |
| 64.5 | .097 | .097 | .098 | .099 | .099 | .100 | .101 | .101 | .102 | .103 |
| 65.0 | .098 | .099 | .099 | .100 | .101 | .101 | .102 | .103 | .103 | .104 |
| 65.5 | −0.099 | −0.100 | −0.101 | −0.101 | −0.102 | −0.103 | −0.103 | −0.104 | −0.105 | −0.105 |
| 66.0 | .101 | .101 | .102 | .103 | .103 | .104 | .105 | .106 | .106 | .107 |
| 66.5 | .102 | .103 | .103 | .104 | .105 | .106 | .106 | .107 | .108 | .108 |
| 67.0 | .103 | .104 | .105 | .106 | .106 | .107 | .108 | .108 | .109 | .110 |
| 67.5 | .105 | .106 | .106 | .107 | .108 | .108 | .109 | .110 | .110 | .111 |
| 68.0 | −0.106 | −0.107 | −0.108 | −0.108 | −0.109 | −0.110 | −0.110 | −0.111 | −0.112 | −0.113 |
| 68.5 | .107 | .108 | .109 | .110 | .110 | .111 | .112 | .113 | .113 | .114 |
| 69.0 | .109 | .110 | .110 | .111 | .112 | .112 | .113 | .114 | .115 | .115 |
| 69.5 | .110 | .111 | .112 | .112 | .113 | .114 | .115 | .115 | .116 | .117 |
| 70.0 | .112 | .112 | .113 | .114 | .115 | .115 | .116 | .117 | .117 | .118 |
| 70.5 | −0.113 | −0.114 | −0.114 | −0.115 | −0.116 | −0.117 | −0.117 | −0.118 | −0.119 | −0.120 |
| 71.0 | .114 | .115 | .116 | .116 | .117 | .118 | .119 | .120 | .120 | .121 |
| 71.5 | .116 | .116 | .117 | .118 | .119 | .119 | .120 | .121 | .122 | .123 |
| 72.0 | .117 | .118 | .118 | .119 | .120 | .121 | .122 | .122 | .123 | .124 |
| 72.5 | .118 | .119 | .120 | .121 | .121 | .122 | .123 | .124 | .125 | .125 |
| 73.0 | −0.120 | −0.120 | −0.121 | −0.122 | −0.123 | −0.124 | −0.124 | −0.125 | −0.126 | −0.127 |
| 73.5 | .121 | .122 | .123 | .123 | .124 | .125 | .126 | .127 | .127 | .128 |
| 74.0 | .122 | .123 | .124 | .125 | .126 | .126 | .127 | .128 | .129 | .130 |
| 74.5 | .124 | .124 | .125 | .126 | .127 | .128 | .129 | .129 | .130 | .131 |
| 75.0 | .125 | .126 | .127 | .127 | .128 | .129 | .130 | .131 | .132 | .132 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## ENGLISH MEASURES.

| ttached Ther- iometer ahren- heit. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 29.8 | 30.0 | 30.2 | 30.4 | 30.6 | 30.8 | 31.0 | 31.2 | 31.4 | 31.6 |
| F. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 75°.5 | −0.126 | −0.127 | −0.128 | −0.129 | −0.130 | −0.131 | −0.131 | −0.132 | −0.133 | −0.134 |
| 76.0 | .128 | .128 | .129 | .130 | .131 | .132 | .133 | .134 | .134 | .135 |
| 76.5 | .129 | .130 | .131 | .132 | .132 | .133 | .134 | .135 | .136 | .137 |
| 77.0 | .130 | .131 | .132 | .133 | .134 | .135 | .136 | .136 | .137 | .138 |
| 77.5 | .132 | .133 | .133 | .134 | .135 | .136 | .137 | .138 | .139 | .140 |
| 78.0 | −0.133 | −0.134 | −0.135 | −0.136 | −0.137 | −0.137 | −0.138 | −0.139 | −0.140 | −0.141 |
| 78.5 | .134 | .135 | .136 | .137 | .138 | .139 | .140 | .141 | .142 | .142 |
| 79.0 | .136 | .137 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .144 |
| 79.5 | .137 | .138 | .139 | .140 | .141 | .142 | .143 | .143 | .144 | .145 |
| 80.0 | .138 | .139 | .140 | .141 | .142 | .143 | .144 | .145 | .146 | .147 |
| 80.5 | −0.140 | −0.141 | −0.142 | −0.142 | −0.143 | −0.144 | −0.145 | −0.146 | −0.147 | −0.148 |
| 81.0 | .141 | .142 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .150 |
| 81.5 | .142 | .143 | .144 | .145 | .146 | .147 | .148 | .149 | .150 | .151 |
| 82.0 | .144 | .145 | .146 | .147 | .148 | .149 | .149 | .150 | .151 | .152 |
| 82.5 | .145 | .146 | .147 | .148 | .149 | .150 | .151 | .152 | .153 | .154 |
| 83.0 | −0.146 | −0.147 | −0.148 | −0.149 | −0.150 | −0.151 | −0.152 | −0.153 | −0.154 | −0.155 |
| 83.5 | .148 | .149 | .150 | .151 | .152 | .153 | .154 | .155 | .156 | .157 |
| 84.0 | .149 | .150 | .151 | .152 | .153 | .154 | .155 | .156 | .157 | .158 |
| 84.5 | .150 | .151 | .152 | .153 | .154 | .155 | .156 | .157 | .158 | .159 |
| 85.0 | .152 | .153 | .154 | .155 | .156 | .157 | .158 | .159 | .160 | .161 |
| 85.5 | −0.153 | −0.154 | −0.155 | −0.156 | −0.157 | −0.158 | −0.159 | −0.160 | −0.161 | −0.162 |
| 86.0 | .154 | .155 | .156 | .158 | .159 | .160 | .161 | .162 | .163 | .164 |
| 86.5 | .156 | .157 | .158 | .159 | .160 | .161 | .162 | .163 | .164 | .165 |
| 87.0 | .157 | .158 | .159 | .160 | .161 | .162 | .163 | .164 | .166 | .167 |
| 87.5 | .158 | .159 | .161 | .162 | .163 | .164 | .165 | .166 | .167 | .168 |
| 88.0 | −0.160 | −0.161 | −0.162 | −0.163 | −0.164 | −0.165 | −0.166 | −0.167 | −0.168 | −0.169 |
| 88.5 | .161 | .162 | .163 | .164 | .165 | .166 | .168 | .169 | .170 | .171 |
| 89.0 | .162 | .164 | .165 | .166 | .167 | .168 | .169 | .170 | .171 | .172 |
| 89.5 | .164 | .165 | .166 | .167 | .168 | .169 | .170 | .171 | .173 | .174 |
| 90.0 | .165 | .166 | .167 | .168 | .170 | .171 | .172 | .173 | .174 | .175 |
| 90.5 | −0.166 | −0.168 | −0.169 | −0.170 | −0.171 | −0.172 | −0.173 | −0.174 | −0.175 | −0.176 |
| 91.0 | .168 | .169 | .170 | .171 | .172 | .173 | .175 | .176 | .177 | .178 |
| 91.5 | .169 | .170 | .171 | .173 | .174 | .175 | .176 | .177 | .178 | .179 |
| 92.0 | .170 | .172 | .173 | .174 | .175 | .176 | .177 | .178 | .180 | .181 |
| 92.5 | .172 | .173 | .174 | .175 | .176 | .178 | .179 | .180 | .181 | .182 |
| 93.0 | −0.173 | −0.174 | −0.175 | −0.177 | −0.178 | −0.179 | −0.180 | −0.181 | −0.182 | −0.184 |
| 93.5 | .174 | .176 | .177 | .178 | .179 | .180 | .181 | .183 | .184 | .185 |
| 94.0 | .176 | .177 | .178 | .179 | .180 | .182 | .183 | .184 | .185 | .186 |
| 94.5 | .177 | .178 | .179 | .181 | .182 | .183 | .184 | .185 | .187 | .188 |
| 95.0 | .178 | .180 | .181 | .182 | .183 | .184 | .186 | .187 | .188 | .189 |
| 95.5 | −0.180 | −0.181 | −0.182 | −0.183 | −0.185 | −0.186 | −0.187 | −0.188 | −0.189 | −0.191 |
| 96.0 | .181 | .182 | .184 | .185 | .186 | .187 | .188 | .190 | .191 | .192 |
| 96.5 | .182 | .184 | .185 | .186 | .187 | .189 | .190 | .191 | .192 | .193 |
| 97.0 | .184 | .185 | .186 | .187 | .189 | .190 | .191 | .192 | .194 | .195 |
| 97.5 | .185 | .186 | .188 | .189 | .190 | .191 | .193 | .194 | .195 | .196 |
| 98.0 | −0.186 | −0.188 | −0.189 | −0.190 | −0.191 | −0.193 | −0.194 | −0.195 | −0.196 | −0.198 |
| 98.5 | .188 | .189 | .190 | .192 | .193 | .194 | .195 | .197 | .198 | .199 |
| 99.0 | .189 | .190 | .192 | .193 | .194 | .195 | .197 | .198 | .199 | .201 |
| 99.5 | .190 | .192 | .193 | .194 | .196 | .197 | .198 | .199 | .201 | .202 |
| 100.0 | .192 | .193 | .194 | .196 | .197 | .198 | .200 | .201 | .202 | .203 |

TABLE 47.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION TO BE SUBTRACTED.

| Attached Thermometer Centigrade. | HEIGHT OF THE BAROMETER IN MILLIMETERS. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0°0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.5 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .04 | .05 |
| 1.0 | .07 | .07 | .08 | .08 | .08 | .08 | .08 | .08 | .08 | .09 | .09 | .09 | .09 |
| 1.5 | .11 | .11 | .11 | .12 | .12 | .12 | .12 | .12 | .13 | .13 | .13 | .13 | .14 |
| 2.0 | .14 | .15 | .15 | .15 | .16 | .16 | .16 | .17 | .17 | .17 | .18 | .18 | .18 |
| 2.5 | 0.18 | 0.18 | 0.19 | 0.19 | 0.20 | 0.20 | 0.20 | 0.21 | 0.21 | 0.22 | 0.22 | 0.22 | 0.23 |
| 3.0 | .22 | .22 | .23 | .23 | .24 | .24 | .24 | .25 | .25 | .26 | .26 | .27 | .27 |
| 3.5 | .25 | .26 | .26 | .27 | .27 | .28 | .29 | .29 | .30 | .30 | .31 | .31 | .32 |
| 4.0 | .29 | .29 | .30 | .31 | .31 | .32 | .33 | .33 | .34 | .35 | .35 | .36 | .37 |
| 4.5 | .32 | .33 | .34 | .35 | .35 | .36 | .37 | .37 | .38 | .39 | .40 | .40 | .41 |
| 5.0 | 0.36 | 0.37 | 0.38 | 0.38 | 0.39 | 0.40 | 0.41 | 0.42 | 0.42 | 0.43 | 0.44 | 0.45 | 0.46 |
| 5.5 | .40 | .40 | .41 | .42 | .43 | .44 | .45 | .46 | .47 | .48 | .48 | .49 | .50 |
| 6.0 | .43 | .44 | .45 | .46 | .47 | .48 | .49 | .50 | .51 | .52 | .53 | .54 | .55 |
| 6.5 | .47 | .48 | .49 | .50 | .51 | .52 | .53 | .54 | .55 | .56 | .57 | .58 | .59 |
| 7.0 | .50 | .51 | .53 | .54 | .55 | .56 | .57 | .58 | .59 | .61 | .62 | .63 | .64 |
| 7.5 | 0.54 | 0.55 | 0.56 | 0.58 | 0.59 | 0.60 | 0.61 | 0.62 | 0.64 | 0.65 | 0.66 | 0.67 | 0.69 |
| 8.0 | .57 | .59 | .60 | .61 | .63 | .64 | .65 | .67 | .68 | .69 | .70 | .72 | .73 |
| 8.5 | .61 | .62 | .64 | .65 | .67 | .68 | .69 | .71 | .72 | .73 | .75 | .76 | .78 |
| 9.0 | .65 | .66 | .68 | .69 | .70 | .72 | .73 | .75 | .76 | .78 | .79 | .81 | .82 |
| 9.5 | .68 | .70 | .71 | .73 | .74 | .76 | .77 | .79 | .81 | .82 | .84 | .85 | .87 |
| 10.0 | 0.72 | 0.73 | 0.75 | 0.77 | 0.78 | 0.80 | 0.82 | 0.83 | 0.85 | 0.86 | 0.88 | 0.90 | 0.91 |
| 10.5 | .75 | .77 | .79 | .80 | .82 | .84 | .86 | .87 | .89 | .91 | .92 | .94 | .96 |
| 11.0 | .79 | .81 | .83 | .84 | .86 | .88 | .90 | .91 | .93 | .95 | .97 | .99 | 1.00 |
| 11.5 | .83 | .84 | .86 | .88 | .90 | .92 | .94 | .96 | .98 | .99 | 1.01 | 1.03 | 1.05 |
| 12.0 | .86 | .88 | .90 | .92 | .94 | .96 | .98 | 1.00 | 1.02 | 1.04 | 1.06 | 1.08 | 1.10 |
| 13.0 | 0.93 | 0.95 | 0.97 | 1.00 | 1.02 | 1.04 | 1.06 | 1.08 | 1.10 | 1.12 | 1.14 | 1.17 | 1.19 |
| 14.0 | 1.00 | 1.03 | 1.05 | 1.07 | 1.10 | 1.12 | 1.14 | 1.16 | 1.19 | 1.21 | 1.23 | 1.25 | 1.28 |
| 15.0 | 1.08 | 1.10 | 1.12 | 1.15 | 1.17 | 1.20 | 1.22 | 1.25 | 1.27 | 1.30 | 1.32 | 1.34 | 1.37 |
| 16.0 | 1.15 | 1.17 | 1.20 | 1.23 | 1.25 | 1.28 | 1.30 | 1.33 | 1.36 | 1.38 | 1.41 | 1.43 | 1.46 |
| 17.0 | 1.22 | 1.25 | 1.27 | 1.30 | 1.33 | 1.36 | 1.38 | 1.41 | 1.44 | 1.47 | 1.50 | 1.52 | 1.55 |
| 18.0 | 1.29 | 1.32 | 1.35 | 1.38 | 1.41 | 1.44 | 1.47 | 1.50 | 1.52 | 1.55 | 1.58 | 1.61 | 1.64 |
| 19.0 | 1.36 | 1.39 | 1.42 | 1.45 | 1.49 | 1.52 | 1.55 | 1.58 | 1.61 | 1.64 | 1.67 | 1.70 | 1.73 |
| 20.0 | 1.43 | 1.47 | 1.50 | 1.53 | 1.56 | 1.60 | 1.63 | 1.66 | 1.69 | 1.73 | 1.76 | 1.79 | 1.82 |
| 21.0 | 1.50 | 1.54 | 1.57 | 1.61 | 1.64 | 1.67 | 1.71 | 1.74 | 1.78 | 1.81 | 1.85 | 1.88 | 1.91 |
| 22.0 | 1.58 | 1.61 | 1.65 | 1.68 | 1.72 | 1.75 | 1.79 | 1.83 | 1.86 | 1.90 | 1.93 | 1.97 | 2.01 |
| 23.0 | 1.65 | 1.68 | 1.72 | 1.76 | 1.80 | 1.83 | 1.87 | 1.91 | 1.95 | 1.98 | 2.02 | 2.06 | 2.10 |
| 24.0 | 1.72 | 1.76 | 1.80 | 1.84 | 1.87 | 1.91 | 1.95 | 1.99 | 2.03 | 2.07 | 2.11 | 2.15 | 2.19 |
| 25.0 | 1.79 | 1.83 | 1.87 | 1.91 | 1.95 | 1.99 | 2.03 | 2.07 | 2.11 | 2.16 | 2.20 | 2.24 | 2.28 |
| 26.0 | 1.86 | 1.90 | 1.95 | 1.99 | 2.03 | 2.07 | 2.11 | 2.16 | 2.20 | 2.24 | 2.28 | 2.33 | 2.37 |
| 27.0 | 1.93 | 1.98 | 2.02 | 2.06 | 2.11 | 2.15 | 2.20 | 2.24 | 2.28 | 2.33 | 2.37 | 2.41 | 2.46 |
| 28.0 | 2.00 | 2.05 | 2.09 | 2.14 | 2.18 | 2.23 | 2.28 | 2.32 | 2.37 | 2.41 | 2.46 | 2.50 | 2.55 |
| 29.0 | 2.07 | 2.12 | 2.17 | 2.22 | 2.26 | 2.31 | 2.36 | 2.40 | 2.45 | 2.50 | 2.55 | 2.59 | 2.64 |
| 30.0 | 2.15 | 2.19 | 2.24 | 2.29 | 2.34 | 2.39 | 2.44 | 2.49 | 2.54 | 2.58 | 2.63 | 2.68 | 2.73 |
| 31.0 | 2.22 | 2.27 | 2.32 | 2.37 | 2.42 | 2.47 | 2.52 | 2.57 | 2.62 | 2.67 | 2.72 | 2.77 | 2.82 |
| 32.0 | 2.29 | 2.34 | 2.39 | 2.44 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.76 | 2.81 | 2.86 | 2.91 |
| 33.0 | 2.36 | 2.41 | 2.47 | 2.52 | 2.57 | 2.63 | 2.68 | 2.73 | 2.79 | 2.84 | 2.89 | 2.95 | 3.00 |
| 34.0 | 2.43 | 2.48 | 2.54 | 2.60 | 2.65 | 2.71 | 2.76 | 2.82 | 2.87 | 2.93 | 2.98 | 3.04 | 3.09 |
| 35.0 | 2.50 | 2.55 | 2.61 | 2.67 | 2.73 | 2.78 | 2.84 | 2.90 | 2.96 | 3.01 | 3.07 | 3.13 | 3.18 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| Attached Thermometer. | HEIGHT OF THE BAROMETER 560 mm. | | | | | HEIGHT OF THE BAROMETER 570 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.05 | 0.07 | 0.00 | 0.02 | 0.04 | 0.06 | 0.07 |
| 1 | .09 | .11 | .13 | .15 | .16 | .09 | .11 | .13 | .15 | .17 |
| 2 | .18 | .20 | .22 | .24 | .26 | .19 | .20 | .22 | .24 | .26 |
| 3 | .27 | .29 | .31 | .33 | .35 | .28 | .30 | .32 | .34 | .35 |
| 4 | .37 | .38 | .40 | .42 | .44 | .37 | .39 | .41 | .43 | .45 |
| 5 | 0.46 | 0.48 | 0.49 | 0.51 | 0.53 | 0.47 | 0.48 | 0.50 | 0.52 | 0.54 |
| 6 | .55 | .57 | .58 | .60 | .62 | .56 | .58 | .60 | .61 | .63 |
| 7 | .64 | .66 | .68 | .69 | .71 | .65 | .67 | .69 | .71 | .73 |
| 8 | .73 | .75 | .77 | .79 | .80 | .74 | .76 | .78 | .80 | .82 |
| 9 | .82 | .84 | .86 | .88 | .90 | .84 | .86 | .87 | .89 | .91 |
| 10 | 0.91 | 0.93 | 0.95 | 0.97 | 0.99 | 0.93 | 0.95 | 0.97 | 0.99 | 1.00 |
| 11 | 1.00 | 1.02 | 1.04 | 1.06 | 1.08 | 1.02 | 1.04 | 1.06 | 1.08 | 1.10 |
| 12 | 1.10 | 1.11 | 1.13 | 1.15 | 1.17 | 1.12 | 1.13 | 1.15 | 1.17 | 1.19 |
| 13 | 1.19 | 1.20 | 1.22 | 1.24 | 1.26 | 1.21 | 1.23 | 1.25 | 1.26 | 1.28 |
| 14 | 1.28 | 1.30 | 1.31 | 1.33 | 1.35 | 1.30 | 1.32 | 1.34 | 1.36 | 1.37 |
| 15 | 1.37 | 1.39 | 1.41 | 1.42 | 1.44 | 1.39 | 1.41 | 1.43 | 1.45 | 1.47 |
| 16 | 1.46 | 1.48 | 1.50 | 1.51 | 1.53 | 1.49 | 1.50 | 1.52 | 1.54 | 1.56 |
| 17 | 1.55 | 1.57 | 1.59 | 1.61 | 1.62 | 1.58 | 1.60 | 1.62 | 1.63 | 1.65 |
| 18 | 1.64 | 1.66 | 1.68 | 1.70 | 1.71 | 1.67 | 1.69 | 1.71 | 1.73 | 1.75 |
| 19 | 1.73 | 1.75 | 1.77 | 1.79 | 1.81 | 1.76 | 1.78 | 1.80 | 1.82 | 1.84 |
| 20 | 1.82 | 1.84 | 1.86 | 1.88 | 1.90 | 1.86 | 1.87 | 1.89 | 1.91 | 1.93 |
| 21 | 1.91 | 1.93 | 1.95 | 1.97 | 1.99 | 1.95 | 1.97 | 1.99 | 2.00 | 2.02 |
| 22 | 2.01 | 2.02 | 2.04 | 2.06 | 2.08 | 2.04 | 2.06 | 2.08 | 2.10 | 2.11 |
| 23 | 2.10 | 2.11 | 2.13 | 2.15 | 2.17 | 2.13 | 2.15 | 2.17 | 2.19 | 2.21 |
| 24 | 2.19 | 2.20 | 2.22 | 2.24 | 2.26 | 2.23 | 2.24 | 2.26 | 2.28 | 2.30 |
| 25 | 2.28 | 2.30 | 2.31 | 2.33 | 2.35 | 2.32 | 2.34 | 2.35 | 2.37 | 2.39 |
| 26 | 2.37 | 2.39 | 2.40 | 2.42 | 2.44 | 2.41 | 2.43 | 2.45 | 2 47 | 2.48 |
| 27 | 2.46 | 2.48 | 2.49 | 2.51 | 2.53 | 2.50 | 2.52 | 2.54 | 2.56 | 2.58 |
| 28 | 2.55 | 2.57 | 2.59 | 2.60 | 2.62 | 2.59 | 2.61 | 2.63 | 2.65 | 2.67 |
| 29 | 2.64 | 2.66 | 2.68 | 2.69 | 2.71 | 2.69 | 2.71 | 2.72 | 2.74 | 2.76 |
| 30 | 2.73 | 2.75 | 2.77 | 2.78 | 2.80 | 2.78 | 2.80 | 2.82 | 2.83 | 2.85 |
| 31 | 2.82 | 2.84 | 2.86 | 2.87 | 2.89 | 2.87 | 2.89 | 2.91 | 2.93 | 2.94 |
| 32 | 2.91 | 2.93 | 2.95 | 2.97 | 2.98 | 2.96 | 2.98 | 3.00 | 3.02 | 3.04 |
| 33 | 3.00 | 3.02 | 3.04 | 3.06 | 3.07 | 3.06 | 3.07 | 3.09 | 3.11 | 3.13 |
| 34 | 3.09 | 3.11 | 3.13 | 3.15 | 3.16 | 3.15 | 3.17 | 3.18 | 3.20 | 3.22 |
| 35 | 3.18 | 3.20 | 3.22 | 3.24 | 3.25 | 3.24 | 3.26 | 3.28 | 3.29 | 3.31 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | Height of the Barometer 580 mm. | | | | | Height of the Barometer 590 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°0 | 0°2 | 0°4 | 0°6 | 0°8 | 0°0 | 0°2 | 0°4 | 0°6 | 0°8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 |
| 1 | .09 | .11 | .13 | .15 | .17 | .10 | .12 | .13 | .15 | .17 |
| 2 | .19 | .21 | .23 | .25 | .27 | .19 | .21 | .23 | .25 | .27 |
| 3 | .28 | .30 | .32 | .34 | .36 | .29 | .31 | .33 | .35 | .37 |
| 4 | .38 | .40 | .42 | .44 | .45 | .39 | .40 | .42 | .44 | .46 |
| 5 | 0.47 | 0.49 | 0.51 | 0.53 | 0.55 | 0.48 | 0.50 | 0.52 | 0.54 | 0.56 |
| 6 | .57 | .59 | .61 | .62 | .64 | .58 | .60 | .62 | .64 | .65 |
| 7 | .66 | .68 | .70 | .72 | .74 | .67 | .69 | .71 | .73 | .75 |
| 8 | .76 | .78 | .79 | .81 | .83 | .77 | .79 | .81 | .83 | .85 |
| 9 | .85 | .87 | .89 | .91 | .93 | .87 | .89 | .90 | .92 | .94 |
| 10 | 0.95 | 0.96 | 0.98 | 1.00 | 1.02 | 0.96 | 0.98 | 1.00 | 1.02 | 1.04 |
| 11 | 1.04 | 1.06 | 1.08 | 1.10 | 1.12 | 1.06 | 1.08 | 1.10 | 1.12 | 1.14 |
| 12 | 1.13 | 1.15 | 1.17 | 1.19 | 1.21 | 1.15 | 1.17 | 1.19 | 1.21 | 1.23 |
| 13 | 1.23 | 1.25 | 1.27 | 1.29 | 1.30 | 1.25 | 1.27 | 1.29 | 1.31 | 1.33 |
| 14 | 1.32 | 1.34 | 1.36 | 1.38 | 1.40 | 1.35 | 1.37 | 1.38 | 1.40 | 1.42 |
| 15 | 1.42 | 1.44 | 1.46 | 1.47 | 1.49 | 1.44 | 1.46 | 1.48 | 1.50 | 1.52 |
| 16 | 1.51 | 1.53 | 1.55 | 1.57 | 1.59 | 1.54 | 1.56 | 1.58 | 1.60 | 1.61 |
| 17 | 1.61 | 1.62 | 1.64 | 1.66 | 1.68 | 1.63 | 1.65 | 1.67 | 1.69 | 1.71 |
| 18 | 1.70 | 1.72 | 1.74 | 1.76 | 1.78 | 1.73 | 1.75 | 1.77 | 1.79 | 1.81 |
| 19 | 1.79 | 1.81 | 1.83 | 1.85 | 1.87 | 1.83 | 1.84 | 1.86 | 1.88 | 1.90 |
| 20 | 1.89 | 1.91 | 1.93 | 1.95 | 1.96 | 1.92 | 1.94 | 1.96 | 1.98 | 2.00 |
| 21 | 1.98 | 2.00 | 2.02 | 2.04 | 2.06 | 2.02 | 2.04 | 2.06 | 2.07 | 2.09 |
| 22 | 2.08 | 2.10 | 2.11 | 2.13 | 2.15 | 2.11 | 2.13 | 2.15 | 2.17 | 2.19 |
| 23 | 2.17 | 2.19 | 2.21 | 2.23 | 2.25 | 2.21 | 2.23 | 2.25 | 2.27 | 2.28 |
| 24 | 2.26 | 2.28 | 2.30 | 2.32 | 2.34 | 2.30 | 2.32 | 2.34 | 2.36 | 2.38 |
| 25 | 2.36 | 2.38 | 2.40 | 2.41 | 2.43 | 2.40 | 2.42 | 2.44 | 2.46 | 2.48 |
| 26 | 2.45 | 2.47 | 2.49 | 2.51 | 2.53 | 2.49 | 2.51 | 2.53 | 2.55 | 2.57 |
| 27 | 2.55 | 2.57 | 2.58 | 2.60 | 2.62 | 2.59 | 2.61 | 2.63 | 2.65 | 2.67 |
| 28 | 2.64 | 2.66 | 2.68 | 2.70 | 2.72 | 2.69 | 2.70 | 2.72 | 2.74 | 2.76 |
| 29 | 2.73 | 2.75 | 2.77 | 2.79 | 2.81 | 2.78 | 2.80 | 2.82 | 2.84 | 2.86 |
| 30 | 2.83 | 2.85 | 2.87 | 2.88 | 2.90 | 2.88 | 2.90 | 2.91 | 2.93 | 2.95 |
| 31 | 2.92 | 2.94 | 2.96 | 2.98 | 3.00 | 2.97 | 2.99 | 3.01 | 3.03 | 3.05 |
| 32 | 3.02 | 3.03 | 3.05 | 3.07 | 3.09 | 3.07 | 3.09 | 3.11 | 3.12 | 3.14 |
| 33 | 3.11 | 3.13 | 3.15 | 3.16 | 3.18 | 3.16 | 3.18 | 3.20 | 3.22 | 3.24 |
| 34 | 3.20 | 3.22 | 3.24 | 3.26 | 3.28 | 3.26 | 3.28 | 3.30 | 3.31 | 3.33 |
| 35 | 3.30 | 3.31 | 3.33 | 3.35 | 3.37 | 3.35 | 3.37 | 3.39 | 3.41 | 3.43 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 600 mm. | | | | | HEIGHT OF THE BAROMETER 605 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 |
| 1 | .10 | .12 | .14 | .16 | .18 | .10 | .12 | .14 | .16 | .18 |
| 2 | .20 | .22 | .24 | .25 | .27 | .20 | .22 | .24 | .26 | .28 |
| 3 | .29 | .31 | .33 | .35 | .37 | .30 | .32 | .34 | .36 | .38 |
| 4 | .39 | .41 | .43 | .45 | .47 | .40 | .41 | .43 | .45 | .47 |
| 5 | 0.49 | 0.51 | 0.53 | 0.55 | 0.57 | 0.49 | 0.51 | 0.53 | 0.55 | 0.57 |
| 6 | .59 | .61 | .63 | .65 | .67 | .59 | .61 | .63 | .65 | .67 |
| 7 | .69 | .70 | .72 | .74 | .76 | .69 | .71 | .73 | .75 | .77 |
| 8 | .78 | .80 | .82 | .84 | .86 | .79 | .81 | .83 | .85 | .87 |
| 9 | .88 | .90 | .92 | .94 | .96 | .89 | .91 | .93 | .95 | .97 |
| 10 | 0.98 | 1.00 | 1.02 | 1.04 | 1.06 | 0.99 | 1.01 | 1.03 | 1.05 | 1.07 |
| 11 | 1.08 | 1.10 | 1.12 | 1.13 | 1.15 | 1.09 | 1.10 | 1.12 | 1.14 | 1.16 |
| 12 | 1.17 | 1.19 | 1.21 | 1.23 | 1.25 | 1.18 | 1.20 | 1.22 | 1.24 | 1.26 |
| 13 | 1.27 | 1.29 | 1.31 | 1.33 | 1.35 | 1.28 | 1.30 | 1.32 | 1.34 | 1.36 |
| 14 | 1.37 | 1.39 | 1.41 | 1.43 | 1.45 | 1.38 | 1.40 | 1.42 | 1.44 | 1.46 |
| 15 | 1.47 | 1.49 | 1.51 | 1.53 | 1.54 | 1.48 | 1.50 | 1.52 | 1.54 | 1.56 |
| 16 | 1.56 | 1.58 | 1.60 | 1.62 | 1.64 | 1.58 | 1.60 | 1.62 | 1.64 | 1.66 |
| 17 | 1.66 | 1.68 | 1.70 | 1.72 | 1.74 | 1.68 | 1.70 | 1.71 | 1.73 | 1.75 |
| 18 | 1.76 | 1.78 | 1.80 | 1.82 | 1.84 | 1.77 | 1.79 | 1.81 | 1.83 | 1.85 |
| 19 | 1.86 | 1.88 | 1.90 | 1.91 | 1.93 | 1.87 | 1.89 | 1.91 | 1.93 | 1.95 |
| 20 | 1.95 | 1.97 | 1.99 | 2.01 | 2.03 | 1.97 | 1.99 | 2.01 | 2.03 | 2.05 |
| 21 | 2.05 | 2.07 | 2.09 | 2.11 | 2.13 | 2.07 | 2.09 | 2.11 | 2.13 | 2.15 |
| 22 | 2.15 | 2.17 | 2.19 | 2.21 | 2.23 | 2.17 | 2.19 | 2.21 | 2.23 | 2.24 |
| 23 | 2.25 | 2.26 | 2.28 | 2.30 | 2.32 | 2.26 | 2.28 | 2.30 | 2.32 | 2.34 |
| 24 | 2.34 | 2.36 | 2.38 | 2.40 | 2.42 | 2.36 | 2.38 | 2.40 | 2.42 | 2.44 |
| 25 | 2.44 | 2.46 | 2.48 | 2.50 | 2.52 | 2.46 | 2.48 | 2.50 | 2.52 | 2.54 |
| 26 | 2.54 | 2.56 | 2.58 | 2.60 | 2.61 | 2.56 | 2.58 | 2.60 | 2.62 | 2.64 |
| 27 | 2.63 | 2.65 | 2.67 | 2.69 | 2.71 | 2.66 | 2.68 | 2.70 | 2.71 | 2.73 |
| 28 | 2.73 | 2.75 | 2.77 | 2.79 | 2.81 | 2.75 | 2.77 | 2.79 | 2.81 | 2.83 |
| 29 | 2.83 | 2.85 | 2.87 | 2.89 | 2.91 | 2.85 | 2.87 | 2.89 | 2.91 | 2.93 |
| 30 | 2.93 | 2.94 | 2.96 | 2.98 | 3.00 | 2.95 | 2.97 | 2.99 | 3.01 | 3.03 |
| 31 | 3.02 | 3.04 | 3.06 | 3.08 | 3.10 | 3.05 | 3.07 | 3.09 | 3.11 | 3.13 |
| 32 | 3.12 | 3.14 | 3.16 | 3.18 | 3.20 | 3.15 | 3.16 | 3.18 | 3.20 | 3.22 |
| 33 | 3.22 | 3.24 | 3.25 | 3.27 | 3.29 | 3.24 | 3.26 | 3.28 | 3.30 | 3.32 |
| 34 | 3.31 | 3.33 | 3.35 | 3.37 | 3.39 | 3.34 | 3.36 | 3.38 | 3.40 | 3.42 |
| 35 | 3.41 | 3.43 | 3.45 | 3.47 | 3.49 | 3.44 | 3.46 | 3.48 | 3.50 | 3.52 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 610 mm. | | | | | HEIGHT OF THE BAROMETER 615 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 |
| 1 | .10 | .12 | .14 | .16 | .18 | .10 | .12 | .14 | .16 | .18 |
| 2 | .20 | .22 | .24 | .26 | .28 | .20 | .22 | .24 | .26 | .28 |
| 3 | .30 | .32 | .34 | .36 | .38 | .30 | .32 | .34 | .36 | .38 |
| 4 | .40 | .42 | .44 | .46 | .48 | .40 | .42 | .44 | .46 | .48 |
| 5 | 0.50 | 0.52 | 0.54 | 0.56 | 0.58 | 0.50 | 0.52 | 0.54 | 0.56 | 0.58 |
| 6 | .60 | .62 | .64 | .66 | .68 | .60 | .62 | .64 | .66 | .68 |
| 7 | .70 | .72 | .74 | .76 | .78 | .70 | .72 | .74 | .76 | .78 |
| 8 | .80 | .82 | .84 | .86 | .88 | .80 | .82 | .84 | .86 | .88 |
| 9 | .90 | .92 | .94 | .96 | .98 | .90 | .92 | .94 | .96 | .98 |
| 10 | 0.99 | 1.01 | 1.03 | 1.05 | 1.07 | 1.00 | 1.02 | 1.04 | 1.06 | 1.08 |
| 11 | 1.09 | 1.11 | 1.13 | 1.15 | 1.17 | 1.10 | 1.12 | 1.14 | 1.16 | 1.18 |
| 12 | 1.19 | 1.21 | 1.23 | 1.25 | 1.27 | 1.20 | 1.22 | 1.24 | 1.26 | 1.28 |
| 13 | 1.29 | 1.31 | 1.33 | 1.35 | 1.37 | 1.30 | 1.32 | 1.34 | 1.36 | 1.38 |
| 14 | 1.39 | 1.41 | 1.43 | 1.45 | 1.47 | 1.40 | 1.42 | 1.44 | 1.46 | 1.48 |
| 15 | 1.49 | 1.51 | 1.53 | 1.55 | 1.57 | 1.50 | 1.52 | 1.54 | 1.56 | 1.58 |
| 16 | 1.59 | 1.61 | 1.63 | 1.65 | 1.67 | 1.60 | 1.62 | 1.64 | 1.66 | 1.68 |
| 17 | 1.69 | 1.71 | 1.73 | 1.75 | 1.77 | 1.70 | 1.72 | 1.74 | 1.76 | 1.78 |
| 18 | 1.79 | 1.81 | 1.83 | 1.85 | 1.87 | 1.80 | 1.82 | 1.84 | 1.86 | 1.88 |
| 19 | 1.89 | 1.91 | 1.93 | 1.95 | 1.97 | 1.90 | 1.92 | 1.94 | 1.96 | 1.98 |
| 20 | 1.99 | 2.01 | 2.03 | 2.05 | 2.07 | 2.00 | 2.02 | 2.04 | 2.06 | 2.08 |
| 21 | 2.09 | 2.10 | 2.12 | 2.14 | 2.16 | 2.10 | 2.12 | 2.14 | 2.16 | 2.18 |
| 22 | 2.18 | 2.20 | 2.22 | 2.24 | 2.26 | 2.20 | 2.22 | 2.24 | 2.26 | 2.28 |
| 23 | 2.28 | 2.30 | 2.32 | 2.34 | 2.36 | 2.30 | 2.32 | 2.34 | 2.36 | 2.38 |
| 24 | 2.38 | 2.40 | 2.42 | 2.44 | 2.46 | 2.40 | 2.42 | 2.44 | 2.46 | 2.48 |
| 25 | 2.48 | 2.50 | 2.52 | 2.54 | 2.56 | 2.50 | 2.52 | 2.54 | 2.56 | 2.58 |
| 26 | 2.58 | 2.60 | 2.62 | 2.64 | 2.66 | 2.60 | 2.62 | 2.64 | 2.66 | 2.68 |
| 27 | 2.68 | 2.70 | 2.72 | 2.74 | 2.76 | 2.70 | 2.72 | 2.74 | 2.76 | 2.78 |
| 28 | 2.78 | 2.80 | 2.82 | 2.84 | 2.86 | 2.80 | 2.82 | 2.84 | 2.86 | 2.88 |
| 29 | 2.88 | 2.90 | 2.91 | 2.93 | 2.95 | 2.90 | 2.92 | 2.94 | 2.96 | 2.98 |
| 30 | 2.97 | 2.99 | 3.01 | 3.03 | 3.05 | 3.00 | 3.02 | 3.04 | 3.06 | 3.08 |
| 31 | 3.07 | 3.09 | 3.11 | 3.13 | 3.15 | 3.10 | 3.12 | 3.14 | 3.16 | 3.18 |
| 32 | 3.17 | 3.19 | 3.21 | 3.23 | 3.25 | 3.20 | 3.22 | 3.24 | 3.26 | 3.28 |
| 33 | 3.27 | 3.29 | 3.31 | 3.33 | 3.35 | 3.30 | 3.32 | 3.34 | 3.36 | 3.38 |
| 34 | 3.37 | 3.39 | 3.41 | 3.43 | 3.45 | 3.40 | 3.42 | 3.44 | 3.46 | 3.48 |
| 35 | 3.47 | 3.49 | 3.51 | 3.53 | 3.55 | 3.49 | 3.51 | 3.53 | 3.55 | 3.57 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 620 mm. | | | | | HEIGHT OF THE BAROMETER 625 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 |
| 1 | .10 | .12 | .14 | .16 | .18 | .10 | .12 | .14 | .16 | .18 |
| 2 | .20 | .22 | .24 | .26 | .28 | .20 | .22 | .24 | .27 | .29 |
| 3 | .30 | .32 | .34 | .36 | .38 | .31 | .33 | .35 | .37 | .39 |
| 4 | .40 | .43 | .45 | .47 | .49 | .41 | .43 | .45 | .47 | .49 |
| 5 | 0.51 | 0.53 | 0.55 | 0.57 | 0.59 | 0.51 | 0.53 | 0.55 | 0.57 | 0.59 |
| 6 | .61 | .63 | .65 | .67 | .69 | .61 | .63 | .65 | .67 | .69 |
| 7 | .71 | .73 | .75 | .77 | .79 | .71 | .73 | .75 | .78 | .80 |
| 8 | .81 | .83 | .85 | .87 | .89 | .82 | .84 | .86 | .88 | .90 |
| 9 | .91 | .93 | .95 | .97 | .99 | .92 | .94 | .96 | .98 | 1.00 |
| 10 | 1.01 | 1.03 | 1.05 | 1.07 | 1.09 | 1.02 | 1.04 | 1.06 | 1.08 | 1.10 |
| 11 | 1.11 | 1.13 | 1.15 | 1.17 | 1.19 | 1.12 | 1.14 | 1.16 | 1.18 | 1.20 |
| 12 | 1.21 | 1.23 | 1.25 | 1.27 | 1.29 | 1.22 | 1.24 | 1.26 | 1.28 | 1.30 |
| 13 | 1.31 | 1.33 | 1.35 | 1.37 | 1.39 | 1.32 | 1.34 | 1.37 | 1.39 | 1.41 |
| 14 | 1.41 | 1.43 | 1.46 | 1.48 | 1.50 | 1.43 | 1.45 | 1.47 | 1.49 | 1.51 |
| 15 | 1.52 | 1.54 | 1.56 | 1.58 | 1.60 | 1.53 | 1.55 | 1.57 | 1.59 | 1.61 |
| 16 | 1.62 | 1.64 | 1.66 | 1.68 | 1.70 | 1.63 | 1.65 | 1.67 | 1.69 | 1.71 |
| 17 | 1.72 | 1.74 | 1.76 | 1.78 | 1.80 | 1.73 | 1.75 | 1.77 | 1.79 | 1.81 |
| 18 | 1.82 | 1.84 | 1.86 | 1.88 | 1.90 | 1.83 | 1.85 | 1.87 | 1.89 | 1.91 |
| 19 | 1.92 | 1.94 | 1.96 | 1.98 | 2.00 | 1.93 | 1.95 | 1.97 | 1.99 | 2.01 |
| 20 | 2.02 | 2.04 | 2.06 | 2.08 | 2.10 | 2.04 | 2.06 | 2.08 | 2.10 | 2.12 |
| 21 | 2.12 | 2.14 | 2.16 | 2.18 | 2.20 | 2.14 | 2.16 | 2.18 | 2.20 | 2.22 |
| 22 | 2.22 | 2.24 | 2.26 | 2.28 | 2.30 | 2.24 | 2.26 | 2.28 | 2.30 | 2.32 |
| 23 | 2.32 | 2.34 | 2.36 | 2.38 | 2.40 | 2.34 | 2.36 | 2.38 | 2.40 | 2.42 |
| 24 | 2.42 | 2.44 | 2.46 | 2.48 | 2.50 | 2.44 | 2.46 | 2.48 | 2.50 | 2.52 |
| 25 | 2.52 | 2.54 | 2.56 | 2.58 | 2.60 | 2.54 | 2.56 | 2.58 | 2.60 | 2.62 |
| 26 | 2.62 | 2.64 | 2.66 | 2.68 | 2.70 | 2.64 | 2.66 | 2.68 | 2.70 | 2.72 |
| 27 | 2.72 | 2.74 | 2.76 | 2.78 | 2.80 | 2.74 | 2.76 | 2.78 | 2.80 | 2.82 |
| 28 | 2.82 | 2.84 | 2.86 | 2.88 | 2.90 | 2.85 | 2.87 | 2.89 | 2.91 | 2.93 |
| 29 | 2.92 | 2.94 | 2.96 | 2.98 | 3.00 | 2.95 | 2.97 | 2.99 | 3.01 | 3.03 |
| 30 | 3.02 | 3.04 | 3.06 | 3.08 | 3.10 | 3.05 | 3.07 | 3.09 | 3.11 | 3.13 |
| 31 | 3.12 | 3.14 | 3.16 | 3.18 | 3.20 | 3.15 | 3.17 | 3.19 | 3.21 | 3.23 |
| 32 | 3.22 | 3.24 | 3.26 | 3.28 | 3.30 | 3.25 | 3.27 | 3.29 | 3.31 | 3.33 |
| 33 | 3.32 | 3.34 | 3.36 | 3.38 | 3.40 | 3.35 | 3.37 | 3.39 | 3.41 | 3.43 |
| 34 | 3.42 | 3.44 | 3.46 | 3.48 | 3.50 | 3.45 | 3.47 | 3.49 | 3.51 | 3.53 |
| 35 | 3.52 | 3.54 | 3.56 | 3.58 | 3.60 | 3.55 | 3.57 | 3.59 | 3.61 | 3.63 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED

| | HEIGHT OF THE BAROMETER 630 mm. | | | | | HEIGHT OF THE BAROMETER 635 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 |
| 1 | .10 | .12 | .14 | .16 | .19 | .10 | .12 | .15 | .17 | .19 |
| 2 | .21 | .23 | .25 | .27 | .29 | .21 | .23 | .25 | .27 | .29 |
| 3 | .31 | .33 | .35 | .37 | .39 | .31 | .33 | .35 | .37 | .39 |
| 4 | .41 | .43 | .45 | .47 | .49 | .41 | .44 | .46 | .48 | .50 |
| 5 | 0.51 | 0.53 | 0.56 | 0.58 | 0.60 | 0.52 | 0.54 | 0.56 | 0.58 | 0.60 |
| 6 | .62 | .64 | .66 | .68 | .70 | .62 | .64 | .66 | .68 | .70 |
| 7 | .72 | .74 | .76 | .78 | .80 | .73 | .75 | .77 | .79 | .81 |
| 8 | .82 | .84 | .86 | .88 | .90 | .83 | .85 | .87 | .89 | .91 |
| 9 | .92 | .95 | .97 | .99 | 1.01 | .93 | .95 | .97 | .99 | 1.02 |
| 10 | 1.03 | 1.05 | 1.07 | 1.09 | 1.11 | 1.04 | 1.06 | 1.08 | 1.10 | 1.12 |
| 11 | 1.13 | 1.15 | 1.17 | 1.19 | 1.21 | 1.14 | 1.16 | 1.18 | 1.20 | 1.22 |
| 12 | 1.23 | 1.25 | 1.27 | 1.29 | 1.31 | 1.24 | 1.26 | 1.28 | 1.30 | 1.33 |
| 13 | 1.34 | 1.36 | 1.38 | 1.40 | 1.42 | 1.35 | 1.37 | 1.39 | 1.41 | 1.43 |
| 14 | 1.44 | 1.46 | 1.48 | 1.50 | 1.52 | 1.45 | 1.47 | 1.49 | 1.51 | 1.53 |
| 15 | 1.54 | 1.56 | 1.58 | 1.60 | 1.62 | 1.55 | 1.57 | 1.59 | 1.61 | 1.63 |
| 16 | 1.64 | 1.66 | 1.68 | 1.70 | 1.72 | 1.66 | 1.68 | 1.70 | 1.72 | 1.74 |
| 17 | 1.74 | 1.77 | 1.79 | 1.81 | 1.83 | 1.76 | 1.78 | 1.80 | 1.82 | 1.84 |
| 18 | 1.85 | 1.87 | 1.89 | 1.91 | 1.93 | 1.86 | 1.88 | 1.90 | 1.92 | 1.94 |
| 19 | 1.95 | 1.97 | 1.99 | 2.01 | 2.03 | 1.96 | 1.99 | 2.01 | 2.03 | 2.05 |
| 20 | 2.05 | 2.07 | 2.09 | 2.11 | 2.13 | 2.07 | 2.09 | 2.11 | 2.13 | 2.15 |
| 21 | 2.15 | 2.17 | 2.19 | 2.21 | 2.24 | 2.17 | 2.19 | 2.21 | 2.23 | 2.25 |
| 22 | 2.26 | 2.28 | 2.30 | 2.32 | 2.34 | 2.27 | 2.29 | 2.31 | 2.34 | 2.36 |
| 23 | 2.36 | 2.38 | 2.40 | 2.42 | 2.44 | 2.38 | 2.40 | 2.42 | 2.44 | 2.46 |
| 24 | 2.46 | 2.48 | 2.50 | 2.52 | 2.54 | 2.48 | 2.50 | 2.52 | 2.54 | 2.56 |
| 25 | 2.56 | 2.58 | 2.60 | 2.62 | 2.64 | 2.58 | 2.60 | 2.62 | 2.64 | 2.66 |
| 26 | 2.66 | 2.68 | 2.70 | 2.73 | 2.75 | 2.69 | 2.71 | 2.73 | 2.75 | 2.77 |
| 27 | 2.77 | 2.79 | 2.81 | 2.83 | 2.85 | 2.79 | 2.81 | 2.83 | 2.85 | 2.87 |
| 28 | 2.87 | 2.89 | 2.91 | 2.93 | 2.95 | 2.89 | 2.91 | 2.93 | 2.95 | 2.97 |
| 29 | 2.97 | 2.99 | 3.01 | 3.03 | 3.05 | 2.99 | 3.01 | 3.03 | 3.05 | 3.08 |
| 30 | 3.07 | 3.09 | 3.11 | 3.13 | 3.15 | 3.10 | 3.12 | 3.14 | 3.16 | 3.18 |
| 31 | 3.17 | 3.19 | 3.21 | 3.23 | 3.25 | 3.20 | 3.22 | 3.24 | 3.26 | 3.28 |
| 32 | 3.28 | 3.30 | 3.32 | 3.34 | 3.36 | 3.30 | 3.32 | 3.34 | 3.36 | 3.38 |
| 33 | 3.38 | 3.40 | 3.42 | 3.44 | 3.46 | 3.40 | 3.42 | 3.44 | 3.47 | 3.49 |
| 34 | 3.48 | 3.50 | 3.52 | 3.54 | 3.56 | 3.51 | 3.53 | 3.55 | 3.57 | 3.59 |
| 35 | 3.58 | 3.60 | 3.62 | 3.64 | 3.66 | 3.61 | 3.63 | 3.65 | 3.67 | 3.69 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 640 mm. | | | | | HEIGHT OF THE BAROMETER 645 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 |
| 1 | .10 | .13 | .15 | .17 | .19 | .11 | .13 | .15 | .17 | .19 |
| 2 | .21 | .23 | .25 | .27 | .29 | .21 | .23 | .25 | .27 | .29 |
| 3 | .31 | .33 | .36 | .38 | .40 | .32 | .34 | .36 | .38 | .40 |
| 4 | .42 | .44 | .46 | .48 | .50 | .42 | .44 | .46 | .48 | .51 |
| 5 | 0.52 | 0.54 | 0.56 | 0.59 | 0.61 | 0.53 | 0.55 | 0.57 | 0.59 | 0.61 |
| 6 | .63 | .65 | .67 | .69 | .71 | .63 | .65 | .67 | .69 | .72 |
| 7 | .73 | .75 | .77 | .79 | .81 | .74 | .76 | .78 | .80 | .82 |
| 8 | .84 | .86 | .88 | .90 | .92 | .84 | .86 | .88 | .90 | .93 |
| 9 | .94 | .96 | .98 | 1.00 | 1.02 | .95 | .97 | .99 | 1.01 | 1.03 |
| 10 | 1.04 | 1.06 | 1.09 | 1.11 | 1.13 | 1.05 | 1.07 | 1.09 | 1.12 | 1.14 |
| 11 | 1.15 | 1.17 | 1.19 | 1.21 | 1.23 | 1.16 | 1.18 | 1.20 | 1.22 | 1.24 |
| 12 | 1.25 | 1.27 | 1.29 | 1.31 | 1.34 | 1.26 | 1.28 | 1.30 | 1.32 | 1.35 |
| 13 | 1.36 | 1.38 | 1.40 | 1.42 | 1.44 | 1.37 | 1.39 | 1.41 | 1.43 | 1.45 |
| 14 | 1.46 | 1.48 | 1.50 | 1.52 | 1.54 | 1.47 | 1.49 | 1.51 | 1.53 | 1.56 |
| 15 | 1.56 | 1.59 | 1.61 | 1.63 | 1.65 | 1.58 | 1.60 | 1.62 | 1.64 | 1.66 |
| 16 | 1.67 | 1.69 | 1.71 | 1.73 | 1.75 | 1.68 | 1.70 | 1.72 | 1.74 | 1.77 |
| 17 | 1.77 | 1.79 | 1.81 | 1.83 | 1.86 | 1.79 | 1.81 | 1.83 | 1.85 | 1.87 |
| 18 | 1.88 | 1.90 | 1.92 | 1.94 | 1.96 | 1.89 | 1.91 | 1.93 | 1.95 | 1.97 |
| 19 | 1.98 | 2.00 | 2.02 | 2.04 | 2.06 | 2.00 | 2.02 | 2.04 | 2.06 | 2.08 |
| 20 | 2.08 | 2.10 | 2.13 | 2.15 | 2.17 | 2.10 | 2.12 | 2.14 | 2.16 | 2.18 |
| 21 | 2.19 | 2.21 | 2.23 | 2.25 | 2.27 | 2.20 | 2.23 | 2.25 | 2.27 | 2.29 |
| 22 | 2.29 | 2.31 | 2.33 | 2.35 | 2.37 | 2.31 | 2.33 | 2.35 | 2.37 | 2.39 |
| 23 | 2.40 | 2.42 | 2.44 | 2.46 | 2.48 | 2.41 | 2.43 | 2.46 | 2.48 | 2.50 |
| 24 | 2.50 | 2.52 | 2.54 | 2.56 | 2.58 | 2.52 | 2.54 | 2.56 | 2.58 | 2.60 |
| 25 | 2.60 | 2.62 | 2.64 | 2.66 | 2.69 | 2.62 | 2.64 | 2.66 | 2.69 | 2.71 |
| 26 | 2.71 | 2.73 | 2.75 | 2.77 | 2.79 | 2.73 | 2.75 | 2.77 | 2.79 | 2.81 |
| 27 | 2.81 | 2.83 | 2.85 | 2.87 | 2.89 | 2.83 | 2.85 | 2.87 | 2.89 | 2.92 |
| 28 | 2.91 | 2.93 | 2.95 | 2.98 | 3.00 | 2.94 | 2.96 | 2.98 | 3.00 | 3.02 |
| 29 | 3.02 | 3.04 | 3.06 | 3.08 | 3.10 | 3.04 | 3.06 | 3.08 | 3.10 | 3.12 |
| 30 | 3.12 | 3.14 | 3.16 | 3.18 | 3.20 | 3.14 | 3.17 | 3.19 | 3.21 | 3.23 |
| 31 | 3.22 | 3.24 | 3.27 | 3.29 | 3.31 | 3.25 | 3.27 | 3.29 | 3.31 | 3.33 |
| 32 | 3.33 | 3.35 | 3.37 | 3.39 | 3.41 | 3.35 | 3.37 | 3.39 | 3.42 | 3.44 |
| 33 | 3.43 | 3.45 | 3.47 | 3.49 | 3.51 | 3.46 | 3.48 | 3.50 | 3.52 | 3.54 |
| 34 | 3.53 | 3.55 | 3.58 | 3 60 | 3.62 | 3.56 | 3.58 | 3.60 | 3.62 | 3.64 |
| 35 | 3.64 | 3.66 | 3.68 | 3.70 | 3.72 | 3.67 | 3.69 | 3.71 | 3.73 | 3.75 |

TABLE 47.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 650 mm. | | | | | HEIGHT OF THE BAROMETER 655 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.08 | 0.00 | 0.02 | 0.04 | 0.06 | 0.09 |
| 1 | .11 | .13 | .15 | .17 | .19 | .11 | .13 | .15 | .17 | .19 |
| 2 | .21 | .23 | .25 | .28 | .30 | .21 | .24 | .26 | .28 | .30 |
| 3 | .32 | .34 | .36 | .38 | .40 | .32 | .34 | .36 | .39 | .41 |
| 4 | .42 | .45 | .47 | .49 | .51 | .43 | .45 | .47 | .49 | .51 |
| 5 | 0.53 | 0.55 | 0.57 | 0.59 | 0.62 | 0.53 | 0.56 | 0.58 | 0.60 | 0.62 |
| 6 | .64 | .66 | .68 | .70 | .72 | .64 | .66 | .68 | .71 | .73 |
| 7 | .74 | .76 | .78 | .81 | .83 | .75 | .77 | .79 | .81 | .83 |
| 8 | .85 | .87 | .89 | .91 | .93 | .85 | .88 | .90 | .92 | .94 |
| 9 | .95 | .98 | 1.00 | 1.02 | 1.04 | .96 | .98 | 1.00 | 1.03 | 1.05 |
| 10 | 1.06 | 1.08 | 1.10 | 1.12 | 1.14 | 1.07 | 1.09 | 1.11 | 1.13 | 1.15 |
| 11 | 1.17 | 1.19 | 1.21 | 1.23 | 1.25 | 1.17 | 1.20 | 1.22 | 1.24 | 1.26 |
| 12 | 1.27 | 1.29 | 1.31 | 1.34 | 1.36 | 1.28 | 1.30 | 1.32 | 1.35 | 1.37 |
| 13 | 1.38 | 1.40 | 1.42 | 1.44 | 1.46 | 1.39 | 1.41 | 1.43 | 1.45 | 1.47 |
| 14 | 1.48 | 1.50 | 1.53 | 1.55 | 1.57 | 1.49 | 1.52 | 1.54 | 1.56 | 1.58 |
| 15 | 1.59 | 1.61 | 1.63 | 1.65 | 1.67 | 1.60 | 1.62 | 1.64 | 1.66 | 1.69 |
| 16 | 1.69 | 1.72 | 1.74 | 1.76 | 1.78 | 1.71 | 1.73 | 1.75 | 1.77 | 1.79 |
| 17 | 1.80 | 1.82 | 1.84 | 1.86 | 1.88 | 1.81 | 1.84 | 1.86 | 1.88 | 1.90 |
| 18 | 1.91 | 1.93 | 1.95 | 1.97 | 1.99 | 1.92 | 1.94 | 1.96 | 1.98 | 2.01 |
| 19 | 2.01 | 2.03 | 2.05 | 2.07 | 2.10 | 2.03 | 2.05 | 2.07 | 2.09 | 2.11 |
| 20 | 2.12 | 2.14 | 2.16 | 2.18 | 2.20 | 2.13 | 2.15 | 2.18 | 2.20 | 2.22 |
| 21 | 2.22 | 2.24 | 2.26 | 2.29 | 2.31 | 2.24 | 2.26 | 2.28 | 2.30 | 2.32 |
| 22 | 2.33 | 2.35 | 2.37 | 2.39 | 2.41 | 2.35 | 2.37 | 2.39 | 2.41 | 2.43 |
| 23 | 2.43 | 2.45 | 2.47 | 2.50 | 2.52 | 2.45 | 2.47 | 2.49 | 2.52 | 2.54 |
| 24 | 2.54 | 2.56 | 2.58 | 2.60 | 2.62 | 2.56 | 2.58 | 2.60 | 2.62 | 2.64 |
| 25 | 2.64 | 2.66 | 2.69 | 2.71 | 2.73 | 2.66 | 2.68 | 2.71 | 2.73 | 2.75 |
| 26 | 2.75 | 2.77 | 2.79 | 2.81 | 2.83 | 2.77 | 2.79 | 2.81 | 2.83 | 2.85 |
| 27 | 2.85 | 2.87 | 2.90 | 2.92 | 2.94 | 2.88 | 2.90 | 2.92 | 2.94 | 2.96 |
| 28 | 2.96 | 2.98 | 3.00 | 3.02 | 3.04 | 2.98 | 3.00 | 3.02 | 3.05 | 3.07 |
| 29 | 3.06 | 3.08 | 3.11 | 3.13 | 3.15 | 3.09 | 3.11 | 3.13 | 3.15 | 3.17 |
| 30 | 3.17 | 3.19 | 3.21 | 3.23 | 3.25 | 3.19 | 3.21 | 3.24 | 3.26 | 3.28 |
| 31 | 3.27 | 3.30 | 3.32 | 3.34 | 3.36 | 3.30 | 3.32 | 3.34 | 3.36 | 3.38 |
| 32 | 3.38 | 3.40 | 3.42 | 3.44 | 3.46 | 3.41 | 3.43 | 3.45 | 3.47 | 3.49 |
| 33 | 3.48 | 3.51 | 3.53 | 3.55 | 3.57 | 3.51 | 3.53 | 3.55 | 3.57 | 3.60 |
| 34 | 3.59 | 3.61 | 3.63 | 3.65 | 3.67 | 3.62 | 3.64 | 3.66 | 3.68 | 3.70 |
| 35 | 3.69 | 3.71 | 3.74 | 3.76 | 3.78 | 3.72 | 3.74 | 3.76 | 3.79 | 3.81 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 660 mm. | | | | | HEIGHT OF THE BAROMETER 665 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.06 | 0.09 | 0.00 | 0.02 | 0.04 | 0.07 | 0.09 |
| 1 | .11 | .13 | .15 | .17 | .19 | .11 | .13 | .15 | .17 | .20 |
| 2 | .22 | .24 | .26 | .28 | .30 | .22 | .24 | .26 | .28 | .30 |
| 3 | .32 | .34 | .37 | .39 | .41 | .33 | .35 | .37 | .39 | .41 |
| 4 | .43 | .45 | .47 | .50 | .52 | .43 | .46 | .48 | .50 | .52 |
| 5 | 0.54 | 0.56 | 0.58 | 0.60 | 0.62 | 0.54 | 0.56 | 0.59 | 0.61 | 0.63 |
| 6 | .65 | .67 | .69 | .71 | .73 | .65 | .67 | .69 | .72 | .74 |
| 7 | .75 | .78 | .80 | .82 | .84 | .76 | .78 | .80 | .82 | .85 |
| 8 | .86 | .88 | .90 | .93 | .95 | .87 | .89 | .91 | .93 | .95 |
| 9 | .97 | .99 | 1.01 | 1.03 | 1.05 | .98 | 1.00 | 1.02 | 1.04 | 1.06 |
| 10 | 1.08 | 1.10 | 1.12 | 1.14 | 1.16 | 1.08 | 1.11 | 1.13 | 1.15 | 1.17 |
| 11 | 1.18 | 1.21 | 1.23 | 1.25 | 1.27 | 1.19 | 1.21 | 1.24 | 1.26 | 1.28 |
| 12 | 1.29 | 1.31 | 1.33 | 1.36 | 1.38 | 1.30 | 1.32 | 1.34 | 1.37 | 1.39 |
| 13 | 1.40 | 1.42 | 1.44 | 1.46 | 1.48 | 1.41 | 1.43 | 1.45 | 1.47 | 1.50 |
| 14 | 1.51 | 1.53 | 1.55 | 1.57 | 1.59 | 1.52 | 1.54 | 1.56 | 1.58 | 1.60 |
| 15 | 1.61 | 1.63 | 1.66 | 1.68 | 1.70 | 1.63 | 1.65 | 1.67 | 1.69 | 1.71 |
| 16 | 1.72 | 1.74 | 1.76 | 1.78 | 1.81 | 1.73 | 1.76 | 1.78 | 1.80 | 1.82 |
| 17 | 1.83 | 1.85 | 1.87 | 1.89 | 1.91 | 1.84 | 1.86 | 1.88 | 1.91 | 1.93 |
| 18 | 1.93 | 1.96 | 1.98 | 2.00 | 2.02 | 1.95 | 1.97 | 1.99 | 2.01 | 2.04 |
| 19 | 2.04 | 2.06 | 2.08 | 2.11 | 2.13 | 2.06 | 2.08 | 2.10 | 2.12 | 2.14 |
| 20 | 2.15 | 2.17 | 2.19 | 2.21 | 2.23 | 2.17 | 2.19 | 2.21 | 2.23 | 2.25 |
| 21 | 2.26 | 2.28 | 2.30 | 2.32 | 2.34 | 2.27 | 2.29 | 2.32 | 2.34 | 2.36 |
| 22 | 2.36 | 2.38 | 2.41 | 2.43 | 2.45 | 2.38 | 2.40 | 2.42 | 2.45 | 2.47 |
| 23 | 2.47 | 2.49 | 2.51 | 2.53 | 2.56 | 2.49 | 2.51 | 2.53 | 2.55 | 2.57 |
| 24 | 2.58 | 2.60 | 2.62 | 2.64 | 2.66 | 2.60 | 2.62 | 2.64 | 2.66 | 2.68 |
| 25 | 2.68 | 2.71 | 2.73 | 2.75 | 2.77 | 2.70 | 2.73 | 2.75 | 2.77 | 2.79 |
| 26 | 2.79 | 2.81 | 2.83 | 2.85 | 2.88 | 2.81 | 2.83 | 2.85 | 2.88 | 2.90 |
| 27 | 2.90 | 2.92 | 2.94 | 2.96 | 2.98 | 2.92 | 2.94 | 2.96 | 2.98 | 3.01 |
| 28 | 3.00 | 3.03 | 3.05 | 3.07 | 3.09 | 3.03 | 3.05 | 3.07 | 3.09 | 3.11 |
| 29 | 3.11 | 3.13 | 3.15 | 3.18 | 3.20 | 3.13 | 3.16 | 3.18 | 3.20 | 3.22 |
| 30 | 3.22 | 3.24 | 3.26 | 3.28 | 3.30 | 3.24 | 3.26 | 3.29 | 3.31 | 3.33 |
| 31 | 3.32 | 3.35 | 3.37 | 3.39 | 3.41 | 3.35 | 3.37 | 3.39 | 3.41 | 3.44 |
| 32 | 3.43 | 3.45 | 3.47 | 3.49 | 3.52 | 3.46 | 3.48 | 3.50 | 3.52 | 3.54 |
| 33 | 3.54 | 3.56 | 3.58 | 3.60 | 3.62 | 3.56 | 3.59 | 3.61 | 3.63 | 3.65 |
| 34 | 3.64 | 3.67 | 3.69 | 3.71 | 3.73 | 3.67 | 3.69 | 3.71 | 3.74 | 3.76 |
| 35 | 3.75 | 3.77 | 3.79 | 3.81 | 3.84 | 3.78 | 3.80 | 3.82 | 3.84 | 3.86 |

TABLE 47.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| Attached Ther-mometer. | HEIGHT OF THE BAROMETER 670 mm. | | | | | HEIGHT OF THE BAROMETER 675 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.07 | 0.09 | 0.00 | 0.02 | 0.04 | 0.07 | 0.09 |
| 1 | .11 | .13 | .15 | .18 | .20 | .11 | .13 | .15 | .18 | .20 |
| 2 | .22 | .24 | .26 | .28 | .31 | .22 | .24 | .26 | .29 | .31 |
| 3 | .33 | .35 | .37 | .39 | .42 | .33 | .35 | .37 | .40 | .42 |
| 4 | .44 | .46 | .48 | .50 | .53 | .44 | .46 | .48 | .51 | .53 |
| 5 | 0.55 | 0.57 | 0.59 | 0.61 | 0.63 | 0.55 | 0.57 | 0.60 | 0.62 | 0.64 |
| 6 | .66 | .68 | .70 | .72 | .74 | .66 | .68 | .71 | .73 | .75 |
| 7 | .77 | .79 | .81 | .83 | .85 | .77 | .79 | .82 | .84 | .86 |
| 8 | .87 | .90 | .92 | .94 | .96 | .88 | .90 | .93 | .95 | .97 |
| 9 | .98 | 1.01 | 1.03 | 1.05 | 1.07 | .99 | 1.01 | 1.04 | 1.06 | 1.08 |
| 10 | 1.09 | 1.11 | 1.14 | 1.16 | 1.18 | 1.10 | 1.12 | 1.14 | 1.17 | 1.19 |
| 11 | 1.20 | 1.22 | 1.25 | 1.27 | 1.29 | 1.21 | 1.23 | 1.25 | 1.28 | 1.30 |
| 12 | 1.31 | 1.33 | 1.35 | 1.38 | 1.40 | 1.32 | 1.34 | 1.36 | 1.39 | 1.41 |
| 13 | 1.42 | 1.44 | 1.46 | 1.49 | 1.51 | 1.43 | 1.45 | 1.47 | 1.50 | 1.52 |
| 14 | 1.53 | 1.55 | 1.57 | 1.59 | 1.62 | 1.54 | 1.56 | 1.58 | 1.61 | 1.63 |
| 15 | 1.64 | 1.66 | 1.68 | 1.70 | 1.72 | 1.65 | 1.67 | 1.69 | 1.72 | 1.74 |
| 16 | 1.75 | 1.77 | 1.79 | 1.81 | 1.83 | 1.76 | 1.78 | 1.80 | 1.83 | 1.85 |
| 17 | 1.86 | 1.88 | 1.90 | 1.92 | 1.94 | 1.87 | 1.89 | 1.91 | 1.94 | 1.96 |
| 18 | 1.96 | 1.99 | 2.01 | 2.03 | 2.05 | 1.98 | 2.00 | 2.02 | 2.04 | 2.07 |
| 19 | 2.07 | 2.09 | 2.12 | 2.14 | 2.16 | 2.09 | 2.11 | 2.13 | 2.15 | 2.18 |
| 20 | 2.18 | 2.20 | 2.23 | 2.25 | 2.27 | 2.20 | 2.22 | 2.24 | 2.26 | 2.29 |
| 21 | 2.29 | 2.31 | 2.33 | 2.36 | 2.38 | 2.31 | 2.33 | 2.35 | 2.37 | 2.39 |
| 22 | 2.40 | 2.42 | 2.44 | 2.46 | 2.49 | 2.42 | 2.44 | 2.46 | 2.48 | 2.50 |
| 23 | 2.51 | 2.53 | 2.55 | 2.57 | 2.59 | 2.53 | 2.55 | 2.57 | 2.59 | 2.61 |
| 24 | 2.62 | 2.64 | 2.66 | 2.68 | 2.70 | 2.64 | 2.66 | 2.68 | 2.70 | 2.72 |
| 25 | 2.72 | 2.75 | 2.77 | 2.79 | 2.81 | 2.74 | 2.77 | 2.79 | 2.81 | 2.83 |
| 26 | 2.83 | 2.85 | 2.88 | 2.90 | 2.92 | 2.85 | 2.88 | 2.90 | 2.92 | 2.94 |
| 27 | 2.94 | 2.96 | 2.98 | 3.01 | 3.03 | 2.96 | 2.99 | 3.01 | 3.03 | 3.05 |
| 28 | 3.05 | 3.07 | 3.09 | 3.11 | 3.14 | 3.07 | 3.09 | 3.12 | 3.14 | 3.16 |
| 29 | 3.16 | 3.18 | 3.20 | 3.22 | 3.24 | 3.18 | 3.20 | 3.23 | 3.25 | 3.27 |
| 30 | 3.27 | 3.29 | 3.31 | 3.33 | 3.35 | 3.29 | 3.31 | 3.33 | 3.36 | 3.38 |
| 31 | 3.37 | 3.40 | 3.42 | 3.44 | 3.46 | 3.40 | 3.42 | 3.44 | 3.47 | 3.49 |
| 33 | 3.48 | 3.50 | 3.53 | 3.55 | 3.57 | 3.51 | 3.53 | 3.55 | 3.57 | 3.60 |
| 33 | 3.59 | 3.61 | 3.63 | 3.66 | 3.68 | 3.62 | 3.64 | 3.66 | 3.68 | 3.71 |
| 34 | 3.70 | 3.72 | 3.74 | 3.76 | 3.79 | 3.73 | 3.75 | 3.77 | 3.79 | 3.81 |
| 35 | 3.81 | 3.83 | 3.85 | 3.87 | 3.89 | 3.84 | 3.86 | 3.88 | 3.90 | 3.92 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 680 mm. | | | | | HEIGHT OF THE BAROMETER 685 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.04 | 0.07 | 0.09 | 0.00 | 0.02 | 0.04 | 0.07 | 0.09 |
| 1 | .11 | .13 | .16 | .18 | .20 | .11 | .13 | .16 | .18 | .20 |
| 2 | .22 | .24 | .27 | .29 | .31 | .22 | .25 | .27 | .29 | .31 |
| 3 | .33 | .36 | .38 | .40 | .42 | .34 | .36 | .38 | .40 | .43 |
| 4 | .44 | .47 | .49 | .51 | .53 | .45 | .47 | .49 | .51 | .54 |
| 5 | 0.56 | 0.58 | 0.60 | 0.62 | 0.64 | 0.56 | 0.58 | 0.60 | 0.63 | 0.65 |
| 6 | .67 | .69 | .71 | .73 | .75 | .67 | .69 | .72 | .74 | .76 |
| 7 | .78 | .80 | .82 | .84 | .87 | .78 | .80 | .83 | .85 | .87 |
| 8 | .89 | .91 | .93 | .95 | .98 | .89 | .92 | .94 | .96 | .98 |
| 9 | 1.00 | 1.02 | 1.04 | 1.06 | 1.09 | 1.01 | 1.03 | 1.05 | 1.07 | 1.09 |
| 10 | 1.11 | 1.13 | 1.15 | 1.18 | 1.20 | 1.12 | 1.14 | 1.16 | 1.18 | 1.21 |
| 11 | 1.22 | 1.24 | 1.26 | 1.29 | 1.31 | 1.23 | 1.25 | 1.27 | 1.30 | 1.32 |
| 12 | 1.33 | 1.35 | 1.37 | 1.40 | 1.42 | 1.34 | 1.36 | 1.38 | 1.41 | 1.43 |
| 13 | 1.44 | 1.46 | 1.49 | 1.51 | 1.53 | 1.45 | 1.47 | 1.50 | 1.52 | 1.54 |
| 14 | 1.55 | 1.57 | 1.60 | 1.62 | 1.64 | 1.56 | 1.59 | 1.61 | 1.63 | 1.65 |
| 15 | 1.66 | 1.68 | 1.71 | 1.73 | 1.75 | 1.67 | 1.70 | 1.72 | 1.74 | 1.76 |
| 16 | 1.77 | 1.79 | 1.82 | 1.84 | 1.86 | 1.79 | 1.81 | 1.83 | 1.85 | 1.87 |
| 17 | 1.88 | 1.91 | 1.93 | 1.95 | 1.97 | 1.90 | 1.92 | 1.94 | 1.96 | 1.99 |
| 18 | 1.99 | 2.02 | 2.04 | 2.06 | 2.08 | 2.01 | 2.03 | 2.05 | 2.07 | 2.10 |
| 19 | 2.10 | 2.13 | 2.15 | 2.17 | 2.19 | 2.12 | 2.14 | 2.16 | 2.19 | 2.21 |
| 20 | 2.21 | 2.24 | 2.26 | 2.28 | 2.30 | 2.23 | 2.25 | 2.27 | 2.30 | 2.32 |
| 21 | 2.32 | 2.35 | 2.37 | 2.39 | 2.41 | 2.34 | 2.36 | 2.39 | 2.41 | 2.43 |
| 22 | 2.43 | 2.46 | 2.48 | 2.50 | 2.52 | 2.45 | 2.47 | 2.50 | 2.52 | 2.54 |
| 23 | 2.54 | 2.57 | 2.59 | 2.61 | 2.63 | 2.56 | 2.59 | 2.61 | 2.63 | 2.65 |
| 24 | 2.66 | 2.68 | 2.70 | 2.72 | 2.74 | 2.67 | 2.70 | 2.72 | 2.74 | 2.76 |
| 25 | 2.77 | 2.79 | 2.81 | 2.83 | 2.85 | 2.79 | 2.81 | 2.83 | 2.85 | 2.87 |
| 26 | 2.88 | 2.90 | 2.92 | 2.94 | 2.96 | 2.90 | 2.92 | 2.94 | 2.96 | 2.99 |
| 27 | 2.99 | 3.01 | 3.03 | 3.05 | 3.07 | 3.01 | 3.03 | 3.05 | 3.07 | 3.10 |
| 28 | 3.10 | 3.12 | 3.14 | 3.16 | 3.18 | 3.12 | 3.14 | 3.16 | 3.18 | 3.21 |
| 29 | 3.21 | 3.23 | 3.25 | 3.27 | 3.29 | 3.23 | 3.25 | 3.27 | 3.30 | 3.32 |
| 30 | 3.32 | 3.34 | 3.36 | 3.38 | 3.40 | 3.34 | 3.36 | 3.38 | 3.41 | 3.43 |
| 31 | 3.43 | 3.45 | 3.47 | 3.49 | 3.51 | 3.45 | 3.47 | 3.49 | 3.52 | 3.54 |
| 32 | 3.54 | 3.56 | 3.58 | 3.60 | 3.62 | 3.56 | 3.58 | 3.61 | 3.63 | 3.65 |
| 33 | 3.64 | 3.67 | 3.69 | 3.71 | 3.73 | 3.67 | 3.69 | 3.72 | 3.74 | 3.76 |
| 34 | 3.75 | 3.78 | 3.80 | 3.82 | 3.84 | 3.78 | 3.80 | 3.83 | 3.85 | 3.87 |
| 35 | 3.86 | 3.89 | 3.91 | 3.93 | 3.95 | 3.89 | 3.91 | 3.94 | 3.96 | 3.98 |

Table 47.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 690 mm. | | | | | HEIGHT OF THE BAROMETER 695 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 |
| 1 | .11 | .14 | .16 | .18 | .20 | .11 | .14 | .16 | .18 | .20 |
| 2 | .23 | .25 | .27 | .29 | .32 | .23 | .25 | .27 | .30 | .32 |
| 3 | .34 | .36 | .38 | .41 | .43 | .34 | .36 | .39 | .41 | .43 |
| 4 | .45 | .47 | .50 | .52 | .54 | .45 | .48 | .50 | .52 | .54 |
| 5 | 0.56 | 0.59 | 0.61 | 0.63 | 0.65 | 0.57 | 0.59 | 0.61 | 0.64 | 0.66 |
| 6 | .68 | .70 | .72 | .74 | .77 | .68 | .70 | .73 | .75 | .77 |
| 7 | .79 | .81 | .83 | .86 | .88 | .79 | .82 | .84 | .86 | .88 |
| 8 | .90 | .92 | .95 | .97 | .99 | .91 | .93 | .95 | .98 | 1.00 |
| 9 | 1.01 | 1.04 | 1.06 | 1.08 | 1.10 | 1.02 | 1.04 | 1.07 | 1.09 | 1.11 |
| 10 | 1.13 | 1.15 | 1.17 | 1.19 | 1.22 | 1.13 | 1.16 | 1.18 | 1.20 | 1.22 |
| 11 | 1.24 | 1.26 | 1.28 | 1.31 | 1.33 | 1.25 | 1.27 | 1.29 | 1.31 | 1.34 |
| 12 | 1.35 | 1.37 | 1.39 | 1.42 | 1.44 | 1.36 | 1.38 | 1.41 | 1.43 | 1.45 |
| 13 | 1.46 | 1.48 | 1.51 | 1.53 | 1.55 | 1.47 | 1.50 | 1.52 | 1.54 | 1.56 |
| 14 | 1.57 | 1.60 | 1.62 | 1.64 | 1.66 | 1.59 | 1.61 | 1.63 | 1.65 | 1.68 |
| 15 | 1.69 | 1.71 | 1.73 | 1.75 | 1.78 | 1.70 | 1.72 | 1.74 | 1.77 | 1.79 |
| 16 | 1.80 | 1.82 | 1.84 | 1.87 | 1.89 | 1.81 | 1.83 | 1.86 | 1.88 | 1.90 |
| 17 | 1.91 | 1.93 | 1.96 | 1.98 | 2.00 | 1.92 | 1.95 | 1.97 | 1.99 | 2.01 |
| 18 | 2.02 | 2.05 | 2.07 | 2.09 | 2.11 | 2.04 | 2.06 | 2.08 | 2.11 | 2.13 |
| 19 | 2.13 | 2.16 | 2.18 | 2.20 | 2.22 | 2.15 | 2.17 | 2.20 | 2.22 | 2.24 |
| 20 | 2.25 | 2.27 | 2.29 | 2.31 | 2.34 | 2.26 | 2.29 | 2.31 | 2.33 | 2.35 |
| 21 | 2.36 | 2.38 | 2.40 | 2.43 | 2.45 | 2.38 | 2.40 | 2.42 | 2.44 | 2.47 |
| 22 | 2.47 | 2.49 | 2.52 | 2.54 | 2.56 | 2.49 | 2.51 | 2.53 | 2.56 | 2.58 |
| 23 | 2.58 | 2.60 | 2.63 | 2.65 | 2.67 | 2.60 | 2.62 | 2.65 | 2.67 | 2.69 |
| 24 | 2.69 | 2.72 | 2.74 | 2.76 | 2.78 | 2.71 | 2.74 | 2.76 | 2.78 | 2.80 |
| 25 | 2.81 | 2.83 | 2.85 | 2.87 | 2.90 | 2.83 | 2.85 | 2.87 | 2.89 | 2.92 |
| 26 | 2.92 | 2.94 | 2.96 | 2.99 | 3.01 | 2.94 | 2.96 | 2.98 | 3.01 | 3.03 |
| 27 | 3.03 | 3.05 | 3.07 | 3.10 | 3.12 | 3.05 | 3.07 | 3.10 | 3.12 | 3.14 |
| 28 | 3.14 | 3.16 | 3.19 | 3.21 | 3.23 | 3.16 | 3.19 | 3.21 | 3.23 | 3.25 |
| 29 | 3.25 | 3.27 | 3.30 | 3.32 | 3.34 | 3.28 | 3.30 | 3.32 | 3.34 | 3.37 |
| 30 | 3.36 | 3.39 | 3.41 | 3.43 | 3.45 | 3.39 | 3.41 | 3.43 | 3.46 | 3.48 |
| 31 | 3.48 | 3.50 | 3.52 | 3.54 | 3.56 | 3.50 | 3.52 | 3.55 | 3.57 | 3.59 |
| 32 | 3.59 | 3.61 | 3.63 | 3.65 | 3.68 | 3.61 | 3.64 | 3.66 | 3.68 | 3.70 |
| 33 | 3.70 | 3.72 | 3.74 | 3.77 | 3.79 | 3.73 | 3.75 | 3.77 | 3.79 | 3.81 |
| 34 | 3.81 | 3.83 | 3.85 | 3.88 | 3.90 | 3.84 | 3.86 | 3.88 | 3.90 | 3.93 |
| 35 | 3.92 | 3.94 | 3.97 | 3.99 | 4.01 | 3.95 | 3.97 | 3.99 | 4.02 | 4.04 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 700 mm. | | | | | HEIGHT OF THE BAROMETER 705 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 |
| 1 | .11 | .14 | .16 | .18 | .21 | .12 | .14 | .16 | .18 | .21 |
| 2 | .23 | .25 | .27 | .30 | .32 | .23 | .25 | .28 | .30 | .32 |
| 3 | .34 | .37 | .39 | .41 | .43 | .35 | .37 | .39 | .41 | .44 |
| 4 | .46 | .48 | .50 | .53 | .55 | .46 | .48 | .51 | .53 | .55 |
| 5 | 0.57 | 0.59 | 0.62 | 0.64 | 0.66 | 0.58 | 0.60 | 0.62 | 0.64 | 0.67 |
| 6 | .69 | .71 | .73 | .75 | .78 | .69 | .71 | .74 | .76 | .78 |
| 7 | .80 | .82 | .85 | .87 | .89 | .81 | .83 | .85 | .87 | .90 |
| 8 | .91 | .94 | .96 | .98 | 1.00 | .92 | .94 | .97 | .99 | 1.01 |
| 9 | 1.03 | 1.05 | 1.07 | 1.10 | 1.12 | 1.04 | 1.06 | 1.08 | 1.10 | 1.13 |
| 10 | 1.14 | 1.16 | 1.19 | 1.21 | 1.23 | 1.15 | 1.17 | 1.20 | 1.22 | 1.24 |
| 11 | 1.26 | 1.28 | 1.30 | 1.32 | 1.35 | 1.26 | 1.29 | 1.31 | 1.33 | 1.36 |
| 12 | 1.37 | 1.39 | 1.42 | 1.44 | 1.46 | 1.38 | 1.40 | 1.43 | 1.45 | 1.47 |
| 13 | 1.48 | 1.51 | 1.53 | 1.55 | 1.57 | 1.49 | 1.52 | 1.54 | 1.56 | 1.59 |
| 14 | 1.60 | 1.62 | 1.64 | 1.67 | 1.69 | 1.61 | 1.63 | 1.65 | 1.68 | 1.70 |
| 15 | 1.71 | 1.73 | 1.76 | 1.78 | 1.80 | 1.72 | 1.75 | 1.77 | 1.79 | 1.81 |
| 16 | 1.82 | 1.85 | 1.87 | 1.89 | 1.92 | 1.84 | 1.86 | 1.88 | 1.91 | 1.93 |
| 17 | 1.94 | 1.96 | 1.98 | 2.01 | 2.03 | 1.95 | 1.98 | 2.00 | 2.02 | 2.04 |
| 18 | 2.05 | 2.07 | 2.10 | 2.12 | 2.14 | 2.07 | 2.09 | 2.11 | 2.14 | 2.16 |
| 19 | 2.17 | 2.19 | 2.21 | 2.23 | 2.26 | 2.18 | 2.20 | 2.23 | 2.25 | 2.27 |
| 20 | 2.28 | 2.30 | 2.32 | 2.35 | 2.37 | 2.30 | 2.32 | 2.34 | 2.36 | 2.39 |
| 21 | 2.39 | 2.42 | 2.44 | 2.46 | 2.48 | 2.41 | 2.43 | 2.46 | 2.48 | 2.50 |
| 22 | 2.51 | 2.53 | 2.55 | 2.57 | 2.60 | 2.52 | 2.55 | 2.57 | 2.59 | 2.62 |
| 23 | 2.62 | 2.64 | 2.67 | 2.69 | 2.71 | 2.64 | 2.66 | 2.68 | 2.71 | 2.73 |
| 24 | 2.73 | 2.76 | 2.78 | 2.80 | 2.82 | 2.75 | 2.78 | 2.80 | 2.82 | 2.84 |
| 25 | 2.85 | 2.87 | 2.89 | 2.91 | 2.94 | 2.87 | 2.89 | 2.91 | 2.94 | 2.96 |
| 26 | 2.96 | 2.98 | 3.01 | 3.03 | 3.05 | 2.98 | 3.00 | 3.03 | 3.05 | 3.07 |
| 27 | 3.07 | 3.10 | 3.12 | 3.14 | 3.16 | 3.10 | 3.12 | 3.14 | 3.16 | 3.19 |
| 28 | 3.19 | 3.21 | 3.23 | 3.25 | 3.28 | 3.21 | 3.23 | 3.25 | 3.28 | 3.30 |
| 29 | 3.30 | 3.32 | 3.34 | 3.37 | 3.39 | 3.32 | 3.35 | 3.37 | 3.39 | 3.41 |
| 30 | 3.41 | 3.44 | 3.46 | 3.48 | 3.50 | 3.44 | 3.46 | 3.48 | 3.51 | 3.53 |
| 31 | 3.53 | 3.55 | 3.57 | 3.59 | 3.62 | 3.55 | 3.57 | 3.60 | 3.62 | 3.64 |
| 32 | 3.64 | 3.66 | 3.68 | 3.71 | 3.73 | 3.66 | 3.69 | 3.71 | 3.73 | 3.76 |
| 33 | 3.75 | 3.77 | 3.80 | 3.82 | 3.84 | 3.78 | 3.80 | 3.82 | 3.85 | 3.87 |
| 34 | 3.87 | 3.89 | 3.91 | 3.93 | 3.96 | 3.89 | 3.92 | 3.94 | 3.96 | 3.98 |
| 35 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.01 | 4.03 | 4.05 | 4.07 | 4.10 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 710 mm. | | | | | HEIGHT OF THE BAROMETER 715 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 |
| 1 | .12 | .14 | .16 | .19 | .21 | .12 | .14 | .16 | .19 | .21 |
| 2 | .23 | .26 | .28 | .30 | .32 | .23 | .26 | .28 | .30 | .33 |
| 3 | .35 | .37 | .39 | .42 | .44 | .35 | .37 | .40 | .42 | .44 |
| 4 | .46 | .49 | .51 | .53 | .56 | .47 | .49 | .51 | .54 | .56 |
| 5 | 0.58 | 0.60 | 0.63 | 0.65 | 0.67 | 0.58 | 0.61 | 0.63 | 0.65 | 0.68 |
| 6 | .70 | .72 | .74 | .76 | .79 | .70 | .72 | .75 | .77 | .79 |
| 7 | .81 | .83 | .86 | .88 | .90 | .82 | .84 | .86 | .89 | .91 |
| 8 | .93 | .95 | .97 | 1.00 | 1.02 | .93 | .96 | .98 | 1.00 | 1.03 |
| 9 | 1.04 | 1.07 | 1.09 | 1.11 | 1.13 | 1.05 | 1.07 | 1.10 | 1.12 | 1.14 |
| 10 | 1.16 | 1.18 | 1.20 | 1.23 | 1.25 | 1.17 | 1.19 | 1.21 | 1.24 | 1.26 |
| 11 | 1.27 | 1.30 | 1.32 | 1.34 | 1.37 | 1.28 | 1.31 | 1.33 | 1.35 | 1.38 |
| 12 | 1.39 | 1.41 | 1.44 | 1.46 | 1.48 | 1.40 | 1.42 | 1.45 | 1.47 | 1.49 |
| 13 | 1.50 | 1.53 | 1.55 | 1.57 | 1.60 | 1.52 | 1.54 | 1.56 | 1.58 | 1.61 |
| 14 | 1.62 | 1.64 | 1.67 | 1.69 | 1.71 | 1.63 | 1.65 | 1.68 | 1.70 | 1.72 |
| 15 | 1.74 | 1.76 | 1.78 | 1.80 | 1.83 | 1.75 | 1.77 | 1.79 | 1.82 | 1.84 |
| 16 | 1.85 | 1.87 | 1.90 | 1.92 | 1.94 | 1.86 | 1.89 | 1.91 | 1.93 | 1.96 |
| 17 | 1.97 | 1.99 | 2.01 | 2.04 | 2.06 | 1.98 | 2.00 | 2.03 | 2.05 | 2.07 |
| 18 | 2.08 | 2.10 | 2.13 | 2.15 | 2.17 | 2.10 | 2.12 | 2.14 | 2.17 | 2.19 |
| 19 | 2.20 | 2.22 | 2.24 | 2.27 | 2.29 | 2.21 | 2.24 | 2.26 | 2.28 | 2.30 |
| 20 | 2.31 | 2.33 | 2.36 | 2.38 | 2.40 | 2.33 | 2.35 | 2.37 | 2.40 | 2.42 |
| 21 | 2.43 | 2.45 | 2.47 | 2.50 | 2.52 | 2.44 | 2.47 | 2.49 | 2.51 | 2.54 |
| 22 | 2.54 | 2.57 | 2.59 | 2.61 | 2.63 | 2.56 | 2.58 | 2.61 | 2.63 | 2.65 |
| 23 | 2.66 | 2.68 | 2.70 | 2.73 | 2.75 | 2.68 | 2.70 | 2.72 | 2.75 | 2.77 |
| 24 | 2.77 | 2.80 | 2.82 | 2.84 | 2.86 | 2.79 | 2.81 | 2.84 | 2.86 | 2.88 |
| 25 | 2.89 | 2.91 | 2.93 | 2.96 | 2.98 | 2.91 | 2.93 | 2.95 | 2.98 | 3.00 |
| 26 | 3.00 | 3.03 | 3.05 | 3.07 | 3.09 | 3.02 | 3.05 | 3.07 | 3.09 | 3.12 |
| 27 | 3.12 | 3.14 | 3.16 | 3.19 | 3.21 | 3.14 | 3.16 | 3.19 | 3.21 | 3.23 |
| 28 | 3.23 | 3.25 | 3.28 | 3.30 | 3.32 | 3.25 | 3.28 | 3.30 | 3.32 | 3.35 |
| 29 | 3.35 | 3.37 | 3.39 | 3.42 | 3.44 | 3.37 | 3.39 | 3.42 | 3.44 | 3.46 |
| 30 | 3.46 | 3.48 | 3.51 | 3.53 | 3.55 | 3.49 | 3.51 | 3.53 | 3.56 | 3.58 |
| 31 | 3.58 | 3.60 | 3.62 | 3.65 | 3.67 | 3.60 | 3.62 | 3.65 | 3.67 | 3.69 |
| 32 | 3.69 | 3.71 | 3.74 | 3.76 | 3.78 | 3.72 | 3.74 | 3.76 | 3.79 | 3.81 |
| 33 | 3.81 | 3.83 | 3.85 | 3.87 | 3.90 | 3.83 | 3.86 | 3.88 | 3.90 | 3.92 |
| 34 | 3.92 | 3.94 | 3.97 | 3.99 | 4.01 | 3.95 | 3.97 | 3.99 | 4.02 | 4.04 |
| 35 | 4.03 | 4.06 | 4.08 | 4.10 | 4.13 | 4.06 | 4.09 | 4.11 | 4.13 | 4.16 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| Attached Thermometer. | HEIGHT OF THE BAROMETER 720 mm. | | | | | HEIGHT OF THE BAROMETER 725 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 | 0.00 | 0.02 | 0.05 | 0.07 | 0.09 |
| 1 | .12 | .14 | .16 | .19 | .21 | .12 | .14 | .17 | .19 | .21 |
| 2 | .24 | .26 | .28 | .31 | .33 | .24 | .26 | .28 | .31 | .33 |
| 3 | .35 | .38 | .40 | .42 | .45 | .36 | .38 | .40 | .43 | .45 |
| 4 | .47 | .49 | .52 | .54 | .56 | .47 | .50 | .52 | .54 | .57 |
| 5 | 0.59 | 0.61 | 0.63 | 0.66 | 0.68 | 0.59 | 0.62 | 0.64 | 0.66 | 0.69 |
| 6 | .71 | .73 | .75 | .78 | .80 | .71 | .73 | .76 | .78 | .80 |
| 7 | .82 | .85 | .87 | .89 | .92 | .83 | .85 | .88 | .90 | .92 |
| 8 | .94 | .96 | .99 | 1.01 | 1.03 | .95 | .97 | .99 | 1.02 | 1.04 |
| 9 | 1.06 | 1.08 | 1.10 | 1.13 | 1.15 | 1.06 | 1.09 | 1.11 | 1.14 | 1.16 |
| 10 | 1.17 | 1.20 | 1.22 | 1.24 | 1.27 | 1.18 | 1.21 | 1.23 | 1.25 | 1.28 |
| 11 | 1.29 | 1.31 | 1.34 | 1.36 | 1.39 | 1.30 | 1.32 | 1.35 | 1.37 | 1.39 |
| 12 | 1.41 | 1.43 | 1.46 | 1.48 | 1.50 | 1.42 | 1.44 | 1.47 | 1.49 | 1.51 |
| 13 | 1.53 | 1.55 | 1.57 | 1.60 | 1.62 | 1.54 | 1.56 | 1.58 | 1.61 | 1.63 |
| 14 | 1.64 | 1.67 | 1.69 | 1.71 | 1.74 | 1.65 | 1.68 | 1.70 | 1.73 | 1.75 |
| 15 | 1.76 | 1.78 | 1.81 | 1.83 | 1.85 | 1.77 | 1.80 | 1.82 | 1.84 | 1.87 |
| 16 | 1.88 | 1.90 | 1.92 | 1.95 | 1.97 | 1.89 | 1.91 | 1.94 | 1.96 | 1.98 |
| 17 | 1.99 | 2.02 | 2.04 | 2.06 | 2.09 | 2.01 | 2.03 | 2.05 | 2.08 | 2.10 |
| 18 | 2.11 | 2.13 | 2.16 | 2.18 | 2.20 | 2.13 | 2.15 | 2.17 | 2.20 | 2.22 |
| 19 | 2.23 | 2.25 | 2.27 | 2.30 | 2.32 | 2.24 | 2.27 | 2.29 | 2.31 | 2.34 |
| 20 | 2.34 | 2.37 | 2.39 | 2.41 | 2.44 | 2.36 | 2.38 | 2.41 | 2.43 | 2.45 |
| 21 | 2.46 | 2.48 | 2.51 | 2.53 | 2.55 | 2.48 | 2.50 | 2.53 | 2.55 | 2.57 |
| 22 | 2.58 | 2.60 | 2.62 | 2.65 | 2.67 | 2.60 | 2.62 | 2.64 | 2.67 | 2.69 |
| 23 | 2.69 | 2.72 | 2.74 | 2.76 | 2.79 | 2.71 | 2.74 | 2.76 | 2.78 | 2.81 |
| 24 | 2.81 | 2.83 | 2.86 | 2.88 | 2.90 | 2.83 | 2.85 | 2.88 | 2.90 | 2.92 |
| 25 | 2.93 | 2.95 | 2.97 | 3.00 | 3.02 | 2.95 | 2.97 | 3.00 | 3.02 | 3.04 |
| 26 | 3.04 | 3.07 | 3.09 | 3.11 | 3.14 | 3.07 | 3.09 | 3.11 | 3.14 | 3.16 |
| 27 | 3.16 | 3.18 | 3.21 | 3.23 | 3.25 | 3.18 | 3.21 | 3.23 | 3.25 | 3.28 |
| 28 | 3.28 | 3.30 | 3.32 | 3.35 | 3.37 | 3.30 | 3.32 | 3.35 | 3.37 | 3.39 |
| 29 | 3.39 | 3.42 | 3.44 | 3.46 | 3.49 | 3.42 | 3.44 | 3.46 | 3.49 | 3.51 |
| 30 | 3.51 | 3.53 | 3.56 | 3.58 | 3.60 | 3.53 | 3.56 | 3.58 | 3.60 | 3.63 |
| 31 | 3.63 | 3.65 | 3.67 | 3.70 | 3.72 | 3.65 | 3.68 | 3.70 | 3.72 | 3.75 |
| 32 | 3.74 | 3.77 | 3.79 | 3.81 | 3.84 | 3.77 | 3.79 | 3.82 | 3.84 | 3.86 |
| 33 | 3.86 | 3.88 | 3.91 | 3.93 | 3.95 | 3.89 | 3.91 | 3.93 | 3.96 | 3.98 |
| 24 | 3.98 | 4.00 | 4.02 | 4.05 | 4.07 | 4.00 | 4.03 | 4.05 | 4.07 | 4.10 |
| 35 | 4.09 | 4.11 | 4.14 | 4.16 | 4.18 | 4.12 | 4.14 | 4.17 | 4.19 | 4.21 |

TABLE 47.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE. THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 730 mm. | | | | | HEIGHT OF THE BAROMETER 735 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°0 | 0°2 | 0°4 | 0°6 | 0°8 | 0°0 | 0°2 | 0°4 | 0°6 | 0°8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 |
| 1 | .12 | .14 | .17 | .19 | .21 | .12 | .14 | .17 | .19 | .22 |
| 2 | .24 | .26 | .29 | .31 | .33 | .24 | .26 | .29 | .31 | .34 |
| 3 | .36 | .38 | .41 | .43 | .45 | .36 | .38 | .41 | .43 | .46 |
| 4 | .48 | .50 | .52 | .55 | .57 | .48 | .50 | .53 | .55 | .58 |
| 5 | 0.60 | 0.62 | 0.64 | 0.67 | 0.69 | 0.60 | 0.62 | 0.65 | 0.67 | 0.70 |
| 6 | .71 | .74 | .76 | .79 | .81 | .72 | .74 | .77 | .79 | .82 |
| 7 | .83 | .86 | .88 | .91 | .93 | .84 | .86 | .89 | .91 | .94 |
| 8 | .95 | .98 | 1.00 | 1.02 | 1.05 | .96 | .98 | 1.01 | 1.03 | 1.06 |
| 9 | 1.07 | 1.10 | 1.12 | 1.14 | 1.17 | 1.08 | 1.10 | 1.13 | 1.15 | 1.17 |
| 10 | 1.19 | 1.21 | 1.24 | 1.26 | 1.29 | 1.20 | 1.22 | 1.25 | 1.27 | 1.29 |
| 11 | 1.31 | 1.33 | 1.36 | 1.38 | 1.40 | 1.32 | 1.34 | 1.37 | 1.39 | 1.41 |
| 12 | 1.43 | 1.45 | 1.48 | 1.50 | 1.52 | 1.44 | 1.46 | 1.49 | 1.51 | 1.53 |
| 13 | 1.55 | 1.57 | 1.59 | 1.62 | 1.64 | 1.56 | 1.58 | 1.61 | 1.63 | 1.65 |
| 14 | 1.67 | 1.69 | 1.71 | 1.74 | 1.76 | 1.68 | 1.70 | 1.72 | 1.75 | 1.77 |
| 15 | 1.78 | 1.81 | 1.83 | 1.86 | 1.88 | 1.80 | 1.82 | 1.84 | 1.87 | 1.89 |
| 16 | 1.90 | 1.93 | 1.95 | 1.97 | 2.00 | 1.92 | 1.94 | 1.96 | 1.99 | 2.01 |
| 17 | 2.02 | 2.05 | 2.07 | 2.09 | 2.12 | 2.04 | 2.06 | 2.08 | 2.11 | 2.13 |
| 18 | 2.14 | 2.16 | 2.19 | 2.21 | 2.23 | 2.15 | 2.18 | 2.20 | 2.23 | 2.25 |
| 19 | 2.26 | 2.28 | 2.31 | 2.33 | 2.35 | 2.27 | 2.30 | 2.32 | 2.35 | 2.37 |
| 20 | 2.38 | 2.40 | 2.42 | 2.45 | 2.47 | 2.39 | 2.42 | 2.44 | 2.46 | 2.49 |
| 21 | 2.50 | 2.52 | 2.54 | 2.57 | 2.59 | 2.51 | 2.54 | 2.56 | 2.58 | 2.61 |
| 22 | 2.61 | 2.64 | 2.66 | 2.68 | 2.71 | 2.63 | 2.66 | 2.68 | 2.70 | 2.73 |
| 23 | 2.73 | 2.76 | 2.78 | 2.80 | 2.83 | 2.75 | 2.77 | 2.80 | 2.82 | 2.85 |
| 24 | 2.85 | 2.87 | 2.90 | 2.92 | 2.94 | 2.87 | 2.89 | 2.92 | 2.94 | 2.97 |
| 25 | 2.97 | 2.99 | 3.02 | 3.04 | 3.06 | 2.99 | 3.01 | 3.04 | 3.06 | 3.08 |
| 26 | 3.09 | 3.11 | 3.13 | 3.16 | 3.18 | 3.11 | 3.13 | 3.16 | 3.18 | 3.20 |
| 27 | 3.20 | 3.23 | 3.25 | 3.28 | 3.30 | 3.23 | 3.25 | 3.27 | 3.30 | 3.32 |
| 28 | 3.32 | 3.35 | 3.37 | 3.39 | 3.42 | 3.35 | 3.37 | 3.39 | 3.42 | 3.44 |
| 29 | 3.44 | 3.46 | 3.49 | 3.51 | 3.54 | 3.46 | 3.49 | 3.51 | 3.54 | 3.56 |
| 30 | 3.56 | 3.58 | 3.61 | 3.63 | 3.65 | 3.58 | 3.61 | 3.63 | 3.65 | 3.68 |
| 31 | 3.68 | 3.70 | 3.72 | 3.75 | 3.77 | 3.70 | 3.73 | 3.75 | 3.77 | 3.80 |
| 32 | 3.79 | 3.82 | 3.84 | 3.87 | 3.89 | 3.82 | 3.84 | 3.87 | 3.89 | 3.92 |
| 33 | 3.91 | 3.94 | 3.96 | 3.98 | 4.01 | 3.94 | 3.96 | 3.99 | 4.01 | 4.03 |
| 34 | 4.03 | 4.05 | 4.08 | 4.10 | 4.12 | 4.06 | 4.08 | 4.11 | 4.13 | 4.15 |
| 35 | 4.15 | 4.17 | 4.20 | 4.22 | 4.24 | 4.18 | 4.20 | 4.22 | 4.25 | 4.27 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 740 mm. | | | | | HEIGHT OF THE BAROMETER 745 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 |
| 1 | .12 | .15 | .17 | .19 | .22 | .12 | .15 | .17 | .19 | .22 |
| 2 | .24 | .27 | .29 | .31 | .34 | .24 | .27 | .29 | .32 | .34 |
| 3 | .36 | .39 | .41 | .44 | .46 | .37 | .39 | .41 | .44 | .46 |
| 4 | .48 | .51 | .53 | .56 | .58 | .49 | .51 | .54 | .56 | .58 |
| 5 | 0.60 | 0.63 | 0.65 | 0.68 | 0.70 | 0.61 | 0.63 | 0.66 | 0.68 | 0.71 |
| 6 | .72 | .75 | .77 | .80 | .82 | .73 | .75 | .78 | .80 | .83 |
| 7 | .85 | .87 | .89 | .92 | .94 | .85 | .88 | .90 | .92 | .95 |
| 8 | .97 | .99 | 1.01 | 1.04 | 1.06 | .97 | 1.00 | 1.02 | 1.05 | 1.07 |
| 9 | 1.09 | 1.11 | 1.13 | 1.16 | 1.18 | 1.09 | 1.12 | 1.14 | 1.17 | 1.19 |
| 10 | 1.21 | 1.23 | 1.26 | 1.28 | 1.30 | 1.22 | 1.24 | 1.26 | 1.29 | 1.31 |
| 11 | 1.33 | 1.35 | 1.38 | 1.40 | 1.42 | 1.34 | 1.36 | 1.38 | 1.41 | 1.43 |
| 12 | 1.45 | 1.47 | 1.50 | 1.52 | 1.54 | 1.46 | 1.48 | 1.51 | 1.53 | 1.55 |
| 13 | 1.57 | 1.59 | 1.62 | 1.64 | 1.66 | 1.58 | 1.60 | 1.63 | 1.65 | 1.68 |
| 14 | 1.69 | 1.71 | 1.74 | 1.76 | 1.78 | 1.70 | 1.72 | 1.75 | 1.77 | 1.80 |
| 15 | 1.81 | 1.83 | 1.86 | 1.88 | 1.90 | 1.82 | 1.85 | 1.87 | 1.89 | 1.92 |
| 16 | 1.93 | 1.95 | 1.98 | 2.00 | 2.03 | 1.94 | 1.97 | 1.99 | 2.01 | 2.04 |
| 17 | 2.05 | 2.07 | 2.10 | 2.12 | 2.15 | 2.06 | 2.09 | 2.11 | 2.14 | 2.16 |
| 18 | 2.17 | 2.19 | 2.22 | 2.24 | 2.27 | 2.18 | 2.21 | 2.23 | 2.26 | 2.28 |
| 19 | 2.29 | 2.31 | 2.34 | 2.36 | 2.39 | 2.31 | 2.33 | 2.35 | 2.38 | 2.40 |
| 20 | 2.41 | 2.43 | 2.46 | 2.48 | 2.51 | 2.43 | 2.45 | 2.47 | 2.50 | 2.52 |
| 21 | 2.53 | 2.55 | 2.58 | 2.60 | 2.63 | 2.55 | 2.57 | 2.59 | 2.62 | 2.64 |
| 22 | 2.65 | 2.67 | 2.70 | 2.72 | 2.75 | 2.67 | 2.69 | 2.72 | 2.74 | 2.76 |
| 23 | 2.77 | 2.79 | 2.82 | 2.84 | 2.87 | 2.79 | 2.81 | 2.84 | 2.86 | 2.88 |
| 24 | 2.89 | 2.91 | 2.94 | 2.96 | 2.99 | 2.91 | 2.93 | 2.96 | 2.98 | 3.01 |
| 25 | 3.01 | 3.03 | 3.06 | 3.08 | 3.11 | 3.03 | 3.05 | 3.08 | 3.10 | 3.13 |
| 26 | 3.13 | 3.15 | 3.18 | 3.20 | 3.22 | 3.15 | 3.17 | 3.20 | 3.22 | 3.25 |
| 27 | 3.25 | 3.27 | 3.30 | 3.32 | 3.34 | 3.27 | 3.29 | 3.32 | 3.34 | 3.37 |
| 28 | 3.37 | 3.39 | 3.42 | 3.44 | 3.46 | 3.39 | 3.42 | 3.44 | 3.46 | 3.49 |
| 29 | 3.49 | 3.51 | 3.54 | 3.56 | 3.58 | 3.51 | 3.54 | 3.56 | 3.58 | 3.61 |
| 30 | 3.61 | 3.63 | 3.66 | 3.68 | 3.70 | 3.63 | 3.66 | 3.68 | 3.70 | 3.73 |
| 31 | 3.73 | 3.75 | 3.78 | 3.80 | 3.82 | 3.75 | 3.78 | 3.80 | 3.82 | 3.85 |
| 32 | 3.85 | 3.87 | 3.89 | 3.92 | 3.94 | 3.87 | 3.90 | 3.92 | 3.95 | 3.97 |
| 33 | 3.97 | 3.99 | 4.01 | 4.04 | 4.06 | 3.99 | 4.02 | 4.04 | 4.07 | 4.09 |
| 34 | 4.09 | 4.11 | 4.13 | 4.16 | 4.18 | 4.11 | 4.14 | 4.16 | 4.19 | 4.21 |
| 35 | 4.21 | 4.23 | 4.25 | 4.28 | 4.30 | 4.23 | 4.26 | 4.28 | 4.31 | 4.33 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 750 mm. | | | | | HEIGHT OF THE BAROMETER 755 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 |
| 1 | .12 | .15 | .17 | .20 | .22 | .12 | .15 | .17 | .20 | .22 |
| 2 | .25 | .27 | .29 | .32 | .34 | .25 | .27 | .30 | .32 | .35 |
| 3 | .37 | .39 | .42 | .44 | .47 | .37 | .39 | .42 | .44 | .47 |
| 4 | .49 | .51 | .54 | .56 | .59 | .49 | .52 | .54 | .57 | .59 |
| 5 | 0.61 | 0.64 | 0.66 | 0.69 | 0.71 | 0.62 | 0.64 | 0.67 | 0.69 | 0.71 |
| 6 | .73 | .76 | .78 | .81 | .83 | .74 | .76 | .79 | .81 | .84 |
| 7 | .86 | .88 | .91 | .93 | .95 | .86 | .89 | .91 | .94 | .96 |
| 8 | .98 | 1.00 | 1.03 | 1.05 | 1.08 | .99 | 1.01 | 1.03 | 1.06 | 1.08 |
| 9 | 1.10 | 1.13 | 1.15 | 1.17 | 1.20 | 1.11 | 1.13 | 1.16 | 1.18 | 1.21 |
| 10 | 1.22 | 1.25 | 1.27 | 1.30 | 1.32 | 1.23 | 1.26 | 1.28 | 1.31 | 1.33 |
| 11 | 1.35 | 1.37 | 1.39 | 1.42 | 1.44 | 1.35 | 1.38 | 1.40 | 1.43 | 1.45 |
| 12 | 1.47 | 1.49 | 1.52 | 1.54 | 1.56 | 1.48 | 1.50 | 1.53 | 1.55 | 1.58 |
| 13 | 1.59 | 1.61 | 1.64 | 1.66 | 1.69 | 1.60 | 1.62 | 1.65 | 1.67 | 1.70 |
| 14 | 1.71 | 1.74 | 1.76 | 1.78 | 1.81 | 1.72 | 1.75 | 1.77 | 1.80 | 1.82 |
| 15 | 1.83 | 1.86 | 1.88 | 1.91 | 1.93 | 1.85 | 1.87 | 1.89 | 1.92 | 1.94 |
| 16 | 1.96 | 1.98 | 2.00 | 2.03 | 2.05 | 1.97 | 1.99 | 2.02 | 2.04 | 2.07 |
| 17 | 2.08 | 2.10 | 2.13 | 2.15 | 2.17 | 2.09 | 2.12 | 2.14 | 2.16 | 2.19 |
| 18 | 2.20 | 2.22 | 2.25 | 2.27 | 2.30 | 2.21 | 2.24 | 2.26 | 2.29 | 2.31 |
| 19 | 2.32 | 2.34 | 2.37 | 2.39 | 2.42 | 2.34 | 2.36 | 2.38 | 2.41 | 2.43 |
| 20 | 2.44 | 2.47 | 2.49 | 2.52 | 2.54 | 2.46 | 2.48 | 2.51 | 2.53 | 2.56 |
| 21 | 2.56 | 2.59 | 2.61 | 2.64 | 2.66 | 2.58 | 2.61 | 2.63 | 2.65 | 2.68 |
| 22 | 2.69 | 2.71 | 2.73 | 2.76 | 2.78 | 2.70 | 2.73 | 2.75 | 2.78 | 2.80 |
| 23 | 2.81 | 2.83 | 2.86 | 2.88 | 2.90 | 2.83 | 2.85 | 2.87 | 2.90 | 2.92 |
| 24 | 2.93 | 2.95 | 2.98 | 3.00 | 3.03 | 2.95 | 2.97 | 3.00 | 3.02 | 3.05 |
| 25 | 3.05 | 3.07 | 3.10 | 3.12 | 3.15 | 3.07 | 3.09 | 3.12 | 3.14 | 3.17 |
| 26 | 3.17 | 3.20 | 3.22 | 3.24 | 3.27 | 3.19 | 3.22 | 3.24 | 3.27 | 3.29 |
| 27 | 3.29 | 3.32 | 3.34 | 3.37 | 3.39 | 3.31 | 3.34 | 3.36 | 3.39 | 3.41 |
| 28 | 3.41 | 3.44 | 3.46 | 3.49 | 3.51 | 3.44 | 3.46 | 3.49 | 3.51 | 3.53 |
| 29 | 3.54 | 3.56 | 3.58 | 3.61 | 3.63 | 3.56 | 3.58 | 3.61 | 3.63 | 3.66 |
| 30 | 3.66 | 3.68 | 3.71 | 3.73 | 3.75 | 3.68 | 3.71 | 3.73 | 3.75 | 3.78 |
| 31 | 3.78 | 3.80 | 3.83 | 3.85 | 3.87 | 3.80 | 3.83 | 3.85 | 3.88 | 3.90 |
| 32 | 3.90 | 3.92 | 3.95 | 3.97 | 4.00 | 3.92 | 3.95 | 3.97 | 4.00 | 4.02 |
| 33 | 4.02 | 4.04 | 4.07 | 4.09 | 4.12 | 4.05 | 4.07 | 4.10 | 4.12 | 4.14 |
| 34 | 4.14 | 4.17 | 4.19 | 4.21 | 4.24 | 4.17 | 4.19 | 4.22 | 4.24 | 4.27 |
| 35 | 4.26 | 4.29 | 4.31 | 4.33 | 4.36 | 4.29 | 4.31 | 4.34 | 4.36 | 4.39 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| Attached Thermometer. | HEIGHT OF THE BAROMETER 760 mm. | | | | | HEIGHT OF THE BAROMETER 765 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.02 | 0.05 | 0.07 | 0.10 | 0.00 | 0.03 | 0.05 | 0.07 | 0.10 |
| 1 | .12 | .15 | .17 | .20 | .22 | .13 | .15 | .17 | .20 | .22 |
| 2 | .25 | .27 | .30 | .32 | .35 | .25 | .27 | .30 | .32 | .35 |
| 3 | .37 | .40 | .42 | .45 | .47 | .37 | .40 | .42 | .45 | .47 |
| 4 | .50 | .52 | .55 | .57 | .60 | .50 | .52 | .55 | .57 | .60 |
| 5 | 0.62 | 0.65 | 0.67 | 0.69 | 0.72 | 0.62 | 0.65 | 0.67 | 0.70 | 0.72 |
| 6 | .74 | .77 | .79 | .82 | .84 | .75 | .77 | .80 | .82 | .85 |
| 7 | .87 | .89 | .92 | .94 | .97 | .87 | .90 | .92 | .95 | .97 |
| 8 | .99 | 1.02 | 1.04 | 1.07 | 1.09 | 1.00 | 1.02 | 1.05 | 1.07 | 1.10 |
| 9 | 1.12 | 1.14 | 1.17 | 1.19 | 1.21 | 1.12 | 1.15 | 1.17 | 1.20 | 1.22 |
| 10 | 1.24 | 1.26 | 1.29 | 1.31 | 1.34 | 1.25 | 1.27 | 1.30 | 1.32 | 1.35 |
| 11 | 1.36 | 1.39 | 1.41 | 1.44 | 1.46 | 1.37 | 1.40 | 1.42 | 1.45 | 1.47 |
| 12 | 1.49 | 1.51 | 1.54 | 1.56 | 1.59 | 1.50 | 1.52 | 1.55 | 1.57 | 1.60 |
| 13 | 1.61 | 1.64 | 1.66 | 1.68 | 1.71 | 1.62 | 1.65 | 1.67 | 1.70 | 1.72 |
| 14 | 1.73 | 1.76 | 1.78 | 1.81 | 1.83 | 1.75 | 1.77 | 1.80 | 1.82 | 1.85 |
| 15 | 1.86 | 1.88 | 1.91 | 1.93 | 1.96 | 1.87 | 1.89 | 1.92 | 1.94 | 1.97 |
| 16 | 1.98 | 2.01 | 2.03 | 2.06 | 2.08 | 1.99 | 2.02 | 2.04 | 2.07 | 2.09 |
| 17 | 2.10 | 2.13 | 2.15 | 2.18 | 2.20 | 2.12 | 2.14 | 2.17 | 2.19 | 2.22 |
| 18 | 2.23 | 2.25 | 2.28 | 2.30 | 2.33 | 2.24 | 2.27 | 2.29 | 2.32 | 2.34 |
| 19 | 2.35 | 2.38 | 2.40 | 2.43 | 2.45 | 2.37 | 2.39 | 2.42 | 2.44 | 2.47 |
| 20 | 2.47 | 2.50 | 2.52 | 2.55 | 2.57 | 2.49 | 2.52 | 2.54 | 2.57 | 2.59 |
| 21 | 2.60 | 2.62 | 2.65 | 2.67 | 2.70 | 2.62 | 2.64 | 2.66 | 2.69 | 2.71 |
| 22 | 2.72 | 2.75 | 2.77 | 2.80 | 2.82 | 2.74 | 2.76 | 2.79 | 2.81 | 2.84 |
| 23 | 2.84 | 2.87 | 2.89 | 2.92 | 2.94 | 2.86 | 2.89 | 2.91 | 2.94 | 2.96 |
| 24 | 2.97 | 2.99 | 3.02 | 3.04 | 3.07 | 2.99 | 3.01 | 3.04 | 3.06 | 3.09 |
| 25 | 3.09 | 3.12 | 3.14 | 3.16 | 3.19 | 3.11 | 3.14 | 3.16 | 3.19 | 3.21 |
| 26 | 3.21 | 3.24 | 3.26 | 3.29 | 3.31 | 3.23 | 3.26 | 3.28 | 3.31 | 3.33 |
| 27 | 3.34 | 3.36 | 3.39 | 3.41 | 3.43 | 3.36 | 3.38 | 3.41 | 3 43 | 3.46 |
| 28 | 3.46 | 3.48 | 3.51 | 3.53 | 3.56 | 3.48 | 3.51 | 3.53 | 3.56 | 3.58 |
| 29 | 3.58 | 3.61 | 3.63 | 3.66 | 3.68 | 3.61 | 3.63 | 3.66 | 3.68 | 3.70 |
| 30 | 3.71 | 3.73 | 3.75 | 3.78 | 3.80 | 3.73 | 3.75 | 3.78 | 3.80 | 3.83 |
| 31 | 3.83 | 3.85 | 3.88 | 3.90 | 3.93 | 3.85 | 3.88 | 3.90 | 3.93 | 3.95 |
| 32 | 3.95 | 3.98 | 4.00 | 4.02 | 4.05 | 3.98 | 4.00 | 4.03 | 4.05 | 4.08 |
| 33 | 4.07 | 4.10 | 4.12 | 4.15 | 4.17 | 4.10 | 4.13 | 4.15 | 4.17 | 4.20 |
| 34 | 4.20 | 4.22 | 4.25 | 4.27 | 4.29 | 4.22 | 4.25 | 4.27 | 4.30 | 4.32 |
| 35 | 4.32 | 4.34 | 4.37 | 4.39 | 4.42 | 4.35 | 4.37 | 4.40 | 4.42 | 4.45 |

TABLE 47.

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| Attached Thermometer. | HEIGHT OF THE BAROMETER 770 mm. 0°0 | 0°2 | 0°4 | 0°6 | 0°8 | HEIGHT OF THE BAROMETER 775 mm. 0°0 | 0°2 | 0°4 | 0°6 | 0°8 |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.03 | 0.05 | 0.08 | 0.10 | 0.00 | 0.03 | 0.05 | 0.08 | 0.10 |
| 1 | .13 | .15 | .18 | .20 | .23 | .13 | .15 | .18 | .20 | .23 |
| 2 | .25 | .28 | .30 | .33 | .35 | .25 | .28 | .30 | .33 | .35 |
| 3 | .38 | .40 | .43 | .45 | .48 | .38 | .40 | .43 | .46 | .48 |
| 4 | .50 | .53 | .55 | .58 | .60 | .51 | .53 | .56 | .58 | .61 |
| 5 | 0.63 | 0.65 | 0.68 | 0.70 | 0.73 | 0.63 | 0.66 | 0.68 | 0.71 | 0.73 |
| 6 | .75 | .78 | .80 | .83 | .85 | .76 | .78 | .81 | .83 | .86 |
| 7 | .88 | .90 | .93 | .95 | .98 | .89 | .91 | .94 | .96 | .99 |
| 8 | 1.01 | 1.03 | 1.06 | 1.08 | 1.11 | 1.01 | 1.04 | 1.06 | 1.09 | 1.11 |
| 9 | 1.13 | 1.16 | 1.18 | 1.21 | 1.23 | 1.14 | 1.16 | 1.19 | 1.21 | 1.24 |
| 10 | 1.26 | 1.28 | 1.31 | 1.33 | 1.36 | 1.26 | 1.29 | 1.31 | 1.34 | 1.36 |
| 11 | 1.38 | 1.41 | 1.43 | 1.46 | 1.48 | 1.39 | 1.42 | 1.44 | 1.47 | 1.49 |
| 12 | 1.51 | 1.53 | 1.56 | 1.58 | 1.61 | 1.52 | 1.54 | 1.57 | 1.59 | 1.62 |
| 13 | 1.63 | 1.66 | 1.68 | 1.71 | 1.73 | 1.64 | 1.67 | 1.69 | 1.72 | 1.74 |
| 14 | 1.76 | 1.78 | 1.81 | 1.83 | 1.86 | 1.77 | 1.79 | 1.82 | 1.84 | 1.87 |
| 15 | 1.88 | 1.91 | 1.93 | 1.96 | 1.98 | 1.89 | 1.92 | 1.94 | 1.97 | 2.00 |
| 16 | 2.01 | 2.03 | 2.06 | 2.08 | 2.11 | 2.02 | 2.05 | 2.07 | 2.10 | 2.12 |
| 17 | 2.13 | 2.16 | 2.18 | 2.21 | 2.23 | 2.15 | 2.17 | 2.20 | 2.22 | 2.25 |
| 18 | 2.26 | 2.28 | 2.31 | 2.33 | 2.36 | 2.27 | 2.30 | 2.32 | 2.35 | 2.37 |
| 19 | 2.38 | 2.41 | 2.43 | 2.46 | 2.48 | 2.40 | 2.42 | 2.45 | 2.47 | 2.50 |
| 20 | 2.51 | 2.53 | 2.56 | 2.58 | 2.61 | 2.52 | 2.55 | 2.57 | 2.60 | 2.62 |
| 21 | 2.63 | 2.66 | 2.68 | 2.71 | 2.73 | 2.65 | 2.67 | 2.70 | 2.72 | 2.75 |
| 22 | 2.76 | 2.78 | 2.81 | 2.83 | 2.86 | 2.77 | 2.80 | 2.83 | 2.85 | 2.88 |
| 23 | 2.88 | 2.91 | 2.93 | 2.96 | 2.98 | 2.90 | 2.93 | 2.95 | 2.98 | 3.00 |
| 24 | 3.01 | 3.03 | 3.06 | 3.08 | 3.11 | 3.03 | 3.05 | 3.08 | 3.10 | 3.13 |
| 25 | 3.13 | 3.16 | 3.18 | 3.21 | 3.23 | 3.15 | 3.18 | 3.20 | 3.23 | 3.25 |
| 26 | 3.26 | 3.28 | 3.31 | 3.33 | 3.36 | 3.28 | 3.30 | 3.33 | 3.35 | 3.38 |
| 27 | 3.38 | 3.41 | 3.43 | 3.46 | 3.48 | 3.40 | 3.43 | 3.45 | 3.48 | 3.50 |
| 28 | 3.51 | 3.53 | 3.56 | 3.58 | 3.60 | 3.53 | 3.55 | 3.58 | 3.60 | 3.63 |
| 29 | 3.63 | 3.65 | 3.68 | 3.70 | 3.73 | 3.65 | 3.68 | 3.70 | 3.73 | 3.75 |
| 30 | 3.75 | 3.78 | 3.80 | 3.83 | 3.85 | 3.78 | 3.80 | 3.83 | 3.85 | 3.88 |
| 31 | 3.88 | 3.90 | 3.93 | 3.95 | 3.98 | 3.90 | 3.93 | 3.95 | 3.98 | 4.00 |
| 32 | 4.00 | 4.03 | 4.05 | 4.08 | 4.10 | 4.03 | 4.05 | 4.08 | 4.10 | 4.13 |
| 33 | 4.13 | 4.15 | 4.18 | 4.20 | 4.23 | 4.15 | 4.18 | 4.20 | 4.23 | 4.25 |
| 34 | 4.25 | 4.28 | 4.30 | 4.33 | 4.35 | 4.28 | 4.30 | 4.33 | 4.35 | 4.38 |
| 35 | 4.38 | 4.40 | 4.43 | 4.45 | 4.48 | 4.40 | 4.43 | 4.45 | 4.48 | 4.50 |

# REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

## METRIC MEASURES.

FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.

| | HEIGHT OF THE BAROMETER 780 mm. | | | | | HEIGHT OF THE BAROMETER 785 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 | 0°.0 | 0°.2 | 0°.4 | 0°.6 | 0°.8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.03 | 0.05 | 0.08 | 0.10 | 0.00 | 0.03 | 0.05 | 0.08 | 0.10 |
| 1 | .13 | .15 | .18 | .20 | .23 | .13 | .15 | .18 | .21 | .23 |
| 2 | .25 | .28 | .31 | .33 | .36 | .26 | .28 | .31 | .33 | .36 |
| 3 | .38 | .41 | .43 | .46 | .48 | .38 | .41 | .44 | .46 | .49 |
| 4 | .51 | .53 | .56 | .59 | .61 | .51 | .54 | .56 | .59 | .62 |
| 5 | 0.64 | 0.66 | 0.69 | 0.71 | 0.74 | 0.64 | 0.67 | 0.69 | 0.72 | 0.74 |
| 6 | .76 | .79 | .81 | .84 | .87 | .77 | .79 | .82 | .85 | .87 |
| 7 | .89 | .92 | .94 | .97 | .99 | .90 | .92 | .95 | .97 | 1.00 |
| 8 | 1.02 | 1.04 | 1.07 | 1.09 | 1.12 | 1.02 | 1.05 | 1.08 | 1.10 | 1.13 |
| 9 | 1.15 | 1.17 | 1.20 | 1.22 | 1.25 | 1.15 | 1.18 | 1.20 | 1.23 | 1.25 |
| 10 | 1.27 | 1.30 | 1.32 | 1.35 | 1.37 | 1.28 | 1.31 | 1.33 | 1.36 | 1.38 |
| 11 | 1.40 | 1.42 | 1.45 | 1.48 | 1.50 | 1.41 | 1.43 | 1.46 | 1.48 | 1.51 |
| 12 | 1.53 | 1.55 | 1.58 | 1.60 | 1.63 | 1.54 | 1.56 | 1.59 | 1.61 | 1.64 |
| 13 | 1.65 | 1.68 | 1.70 | 1.73 | 1.75 | 1.66 | 1.69 | 1.71 | 1.74 | 1.77 |
| 14 | 1.78 | 1.81 | 1.83 | 1.86 | 1.88 | 1.79 | 1.82 | 1.84 | 1.87 | 1.89 |
| 15 | 1.91 | 1.93 | 1.96 | 1.98 | 2.01 | 1.92 | 1.94 | 1.97 | 2.00 | 2.02 |
| 16 | 2.03 | 2.06 | 2.08 | 2.11 | 2.13 | 2.05 | 2.07 | 2.10 | 2.12 | 2.15 |
| 17 | 2.16 | 2.19 | 2.21 | 2.24 | 2.26 | 2.17 | 2.20 | 2.22 | 2.25 | 2.28 |
| 18 | 2.29 | 2.31 | 2.34 | 2.36 | 2.39 | 2.30 | 2.33 | 2.35 | 2.38 | 2.40 |
| 19 | 2.41 | 2.44 | 2.46 | 2.49 | 2.51 | 2.43 | 2.45 | 2.48 | 2.51 | 2.53 |
| 20 | 2.54 | 2.57 | 2.59 | 2.62 | 2.64 | 2.56 | 2.58 | 2.61 | 2.63 | 2.66 |
| 21 | 2.67 | 2.69 | 2.72 | 2.74 | 2.77 | 2.68 | 2.71 | 2.73 | 2.76 | 2.79 |
| 22 | 2.79 | 2.82 | 2.84 | 2.87 | 2.89 | 2.81 | 2.84 | 2.86 | 2.89 | 2.91 |
| 23 | 2.92 | 2.94 | 2.97 | 3.00 | 3.02 | 2.94 | 2.96 | 2.99 | 3.01 | 3.04 |
| 24 | 3.05 | 3.07 | 3.10 | 3.12 | 3.15 | 3.07 | 3.09 | 3.12 | 3.14 | 3.17 |
| 25 | 3.17 | 3.20 | 3.22 | 3.25 | 3.27 | 3.19 | 3.22 | 3.24 | 3.27 | 3.29 |
| 26 | 3.30 | 3.32 | 3.35 | 3.37 | 3.40 | 3.32 | 3.34 | 3.37 | 3.40 | 3.42 |
| 27 | 3.42 | 3.45 | 3.47 | 3.50 | 3.53 | 3.45 | 3.47 | 3.50 | 3.52 | 3.55 |
| 28 | 3.55 | 3.58 | 3.60 | 3.63 | 3.65 | 3.57 | 3.60 | 3.62 | 3.65 | 3.67 |
| 29 | 3.68 | 3.70 | 3.73 | 3.75 | 3.78 | 3.70 | 3.73 | 3.75 | 3.78 | 3.80 |
| 30 | 3.80 | 3.83 | 3.85 | 3.88 | 3.90 | 3.83 | 3.85 | 3.88 | 3.90 | 3.93 |
| 31 | 3.93 | 3.95 | 3.98 | 4.00 | 4.03 | 3.95 | 3.98 | 4.00 | 4.03 | 4.06 |
| 32 | 4.05 | 4.08 | 4.11 | 4.13 | 4.16 | 4.08 | 4.11 | 4.13 | 4.16 | 4.18 |
| 33 | 4.18 | 4.21 | 4.23 | 4.26 | 4.28 | 4.21 | 4.23 | 4.26 | 4.28 | 4.31 |
| 34 | 4.31 | 4.33 | 4.36 | 4.38 | 4.41 | 4.33 | 4.36 | 4.39 | 4.41 | 4.44 |
| 35 | 4.43 | 4.46 | 4.48 | 4.51 | 4.53 | 4.46 | 4.49 | 4.51 | 4.54 | 4.56 |

## REDUCTION OF THE BAROMETER TO STANDARD TEMPERATURE.

### METRIC MEASURES.

**FOR TEMPERATURES ABOVE 0° CENTIGRADE, THE CORRECTION IS TO BE SUBTRACTED.**

| | HEIGHT OF THE BAROMETER 790 mm. | | | | | HEIGHT OF THE BAROMETER 795 mm. | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Attached Thermometer. | 0°0 | 0°2 | 0°4 | 0°6 | 0°8 | 0°0 | 0°2 | 0°4 | 0°6 | 0°8 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 0.00 | 0.03 | 0.05 | 0.08 | 0.10 | 0.00 | 0.03 | 0.05 | 0.08 | 0.10 |
| 1 | .13 | .15 | .18 | .21 | .23 | .13 | .16 | .18 | .21 | .23 |
| 2 | .26 | .28 | .31 | .34 | .36 | .26 | .29 | .31 | .34 | .36 |
| 3 | .39 | .41 | .44 | .46 | .49 | .39 | .42 | .44 | .47 | .49 |
| 4 | .52 | .54 | .57 | .59 | .62 | .52 | .55 | .57 | .60 | .62 |
| 5 | 0.64 | 0.67 | 0.70 | 0.72 | 0.75 | 0.65 | 0.67 | 0.70 | 0.73 | 0.75 |
| 6 | .77 | .80 | .83 | .85 | .88 | .78 | .80 | .83 | .86 | .88 |
| 7 | .90 | .93 | .95 | .98 | 1.01 | .91 | .93 | .96 | .99 | 1.01 |
| 8 | 1.03 | 1.06 | 1.08 | 1.11 | 1.13 | 1.04 | 1.06 | 1.09 | 1.12 | 1.14 |
| 9 | 1.16 | 1.19 | 1.21 | 1.24 | 1.26 | 1.17 | 1.19 | 1.22 | 1.24 | 1.27 |
| 10 | 1.29 | 1.31 | 1.34 | 1.37 | 1.39 | 1.30 | 1.32 | 1.35 | 1.37 | 1.40 |
| 11 | 1.42 | 1.44 | 1.47 | 1.49 | 1.52 | 1.43 | 1.45 | 1.48 | 1.50 | 1.53 |
| 12 | 1.55 | 1.57 | 1.60 | 1.62 | 1.65 | 1.56 | 1.58 | 1.61 | 1.63 | 1.66 |
| 13 | 1.67 | 1.70 | 1.73 | 1.75 | 1.78 | 1.68 | 1.71 | 1.74 | 1.76 | 1.79 |
| 14 | 1.80 | 1.83 | 1.85 | 1.88 | 1.91 | 1.81 | 1.84 | 1.87 | 1.89 | 1.92 |
| 15 | 1.93 | 1.96 | 1.98 | 2.01 | 2.03 | 1.94 | 1.97 | 1.99 | 2.02 | 2.05 |
| 16 | 2.06 | 2.09 | 2.11 | 2.14 | 2.16 | 2.07 | 2.10 | 2.12 | 2.15 | 2.18 |
| 17 | 2.19 | 2.21 | 2.24 | 2.26 | 2.29 | 2.20 | 2.23 | 2.25 | 2.28 | 2.30 |
| 18 | 2.32 | 2.34 | 2.37 | 2.39 | 2.42 | 2.33 | 2.36 | 2.38 | 2.41 | 2.43 |
| 19 | 2.44 | 2.47 | 2.50 | 2.52 | 2.55 | 2.46 | 2.49 | 2.51 | 2.54 | 2.56 |
| 20 | 2.57 | 2.60 | 2.62 | 2.65 | 2.67 | 2.59 | 2.61 | 2.64 | 2.67 | 2.69 |
| 21 | 2.70 | 2.73 | 2.75 | 2.78 | 2.80 | 2.72 | 2.74 | 2.77 | 2.79 | 2.82 |
| 22 | 2.83 | 2.85 | 2.88 | 2.91 | 2.93 | 2.85 | 2.87 | 2.90 | 2.92 | 2.95 |
| 23 | 2.96 | 2.98 | 3.01 | 3.03 | 3.06 | 2.98 | 3.00 | 3.03 | 3.05 | 3.08 |
| 24 | 3.08 | 3.11 | 3.14 | 3.16 | 3.19 | 3.10 | 3.13 | 3.16 | 3.18 | 3.21 |
| 25 | 3.21 | 3.24 | 3.26 | 3.29 | 3.31 | 3.23 | 3.26 | 3.28 | 3.31 | 3.34 |
| 26 | 3.34 | 3.37 | 3.39 | 3.42 | 3.44 | 3.36 | 3.39 | 3.41 | 3.44 | 3.46 |
| 27 | 3.47 | 3.49 | 3.52 | 3.54 | 3.57 | 3.49 | 3.52 | 3.54 | 3.57 | 3.59 |
| 28 | 3.60 | 3.62 | 3.65 | 3.67 | 3.70 | 3.62 | 3.64 | 3.67 | 3.70 | 3.72 |
| 29 | 3.72 | 3.75 | 3.77 | 3.80 | 3.83 | 3.75 | 3.77 | 3.80 | 3.82 | 3.85 |
| 30 | 3.85 | 3.88 | 3.90 | 3.93 | 3.95 | 3.88 | 3.90 | 3.93 | 3.95 | 3.98 |
| 31 | 3.98 | 4.00 | 4.03 | 4.06 | 4.08 | 4.00 | 4.03 | 4.06 | 4.08 | 4.11 |
| 32 | 4.11 | 4.13 | 4.16 | 4.18 | 4.21 | 4.13 | 4.16 | 4.18 | 4.21 | 4.24 |
| 33 | 4.23 | 4.26 | 4.29 | 4.31 | 4.34 | 4.26 | 4.29 | 4.31 | 4.34 | 4.36 |
| 34 | 4.36 | 4.39 | 4.41 | 4.44 | 4.46 | 4.39 | 4.42 | 4.44 | 4.47 | 4.49 |
| 35 | 4.49 | 4.51 | 4.54 | 4.57 | 4.59 | 4.52 | 4.54 | 4.57 | 4.59 | 4.62 |

# CORRECTIONS TO REDUCE BAROMETRIC READINGS TO STANDARD GRAVITY.

$$C = \frac{(g_l - g)}{g} B$$

(WITH $g_l < g$ THE CORRECTION IS TO BE SUBTRACTED; WITH $g_l > g$, IT IS TO BE ADDED.)

| $g_l - g$ | BAROMETER READING $B$. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |
| Dynes. | | | | | | | | | | |
| 0.1 | 0.00010 | 0.00020 | 0.00031 | 0.00041 | 0.00051 | 0.00061 | 0.00071 | 0.00082 | 0.00092 | 0.00102 |
| 0.2 | 00020 | 00041 | 00061 | 00082 | 00102 | 00122 | 00143 | 00163 | 00184 | 00204 |
| 0.3 | 00031 | 00061 | 00092 | 00122 | 00153 | 00184 | 00214 | 00245 | 00275 | 00306 |
| 0.4 | 00041 | 00082 | 00122 | 00163 | 00204 | 00245 | 00286 | 00326 | 00367 | 00408 |
| 0.5 | 00051 | 00102 | 00153 | 00204 | 00255 | 00306 | 00357 | 00408 | 00459 | 00510 |
| 0.6 | 0.00061 | 0.00122 | 0.00184 | 0.00245 | 0.00306 | 0.00367 | 0.00428 | 0.00489 | 0.00551 | 0.00612 |
| 0.7 | 00071 | 00143 | 00214 | 00286 | 00357 | 00428 | 00500 | 00571 | 00642 | 00714 |
| 0.8 | 00082 | 00163 | 00245 | 00326 | 00408 | 00489 | 00571 | 00653 | 00734 | 00816 |
| 0.9 | 00092 | 00184 | 00275 | 00367 | 00459 | 00551 | 00642 | 00734 | 00826 | 00918 |
| 1.0 | 00102 | 00204 | 00306 | 00408 | 00510 | 00612 | 00714 | 00816 | 00918 | 01020 |
| 1.1 | 0.00112 | 0.00224 | 0.00337 | 0.00449 | 0.00561 | 0.00673 | 0.00785 | 0.00897 | 0.01010 | 0.01122 |
| 1.2 | 00122 | 00245 | 00367 | 00489 | 00612 | 00734 | 00857 | 00979 | 01101 | 01224 |
| 1.3 | 00133 | 00265 | 00398 | 00530 | 00663 | 00795 | 00928 | 01061 | 01193 | 01326 |
| 1.4 | 00143 | 00286 | 00428 | 00571 | 00714 | 00857 | 00999 | 01142 | 01285 | 01428 |
| 1.5 | 00153 | 00306 | 00459 | 00612 | 00765 | 00918 | 01071 | 01224 | 01377 | 01530 |
| 1.6 | 0.00163 | 0.00326 | 0.00489 | 0.00653 | 0.00816 | 0.00979 | 0.01142 | 0.01305 | 0.01468 | 0.01632 |
| 1.7 | 00173 | 00347 | 00520 | 00693 | 00867 | 01040 | 01213 | 01387 | 01560 | 01734 |
| 1.8 | 00184 | 00367 | 00551 | 00734 | 00918 | 01101 | 01285 | 01468 | 01652 | 01835 |
| 1.9 | 00194 | 00387 | 00581 | 00775 | 00969 | 01162 | 01356 | 01550 | 01744 | 01937 |
| 2.0 | 00204 | 00408 | 00612 | 00816 | 01020 | 01224 | 01428 | 01632 | 01835 | 02039 |
| 2.1 | 0.00214 | 0.00428 | 0.00642 | 0.00857 | 0.01071 | 0.01285 | 0.01499 | 0.01713 | 0.01927 | 0.02141 |
| 2.2 | 00224 | 00449 | 00673 | 00897 | 01122 | 01346 | 01570 | 01795 | 02019 | 02243 |
| 2.3 | 00235 | 00469 | 00704 | 00938 | 01173 | 01407 | 01642 | 01876 | 02111 | 02345 |
| 2.4 | 00245 | 00489 | 00734 | 00979 | 01224 | 01468 | 01713 | 01958 | 02203 | 02447 |
| 2.5 | 00255 | 00510 | 00765 | 01020 | 01275 | 01530 | 01785 | 02039 | 02294 | 02549 |
| 2.6 | 0.00265 | 0.00530 | 0.00795 | 0.01061 | 0.01326 | 0.01591 | 0.01856 | 0.02121 | 0.02386 | 0.02651 |
| 2.7 | 00275 | 00551 | 00826 | 01101 | 01377 | 01652 | 01927 | 02203 | 02478 | 02753 |
| 2.8 | 00286 | 00571 | 00857 | 01142 | 01428 | 01713 | 01999 | 02284 | 02570 | 02855 |
| 2.9 | 00296 | 00591 | 00887 | 01183 | 01479 | 01774 | 02070 | 02366 | 02661 | 02958 |
| 3.0 | 00306 | 00612 | 00918 | 01224 | 01530 | 01835 | 02141 | 02447 | 02753 | 03059 |
| 3.1 | 0.00316 | 0.00632 | 0.00948 | 0.01264 | 0.01581 | 0.01897 | 0.02213 | 0.02529 | 0.02845 | 0.03161 |
| 3.2 | 00326 | 00653 | 00979 | 01305 | 01632 | 01958 | 02284 | 02610 | 02937 | 03263 |
| 3.3 | 00337 | 00673 | 01010 | 01346 | 01683 | 02019 | 02356 | 02692 | 03029 | 03365 |
| 3.4 | 00347 | 00693 | 01040 | 01387 | 01734 | 02080 | 02427 | 02774 | 03120 | 03467 |
| 3.5 | 00357 | 00714 | 01071 | 01428 | 01785 | 02141 | 02498 | 02855 | 03212 | 03569 |
| 3.6 | 0.00367 | 0.00734 | 0.01101 | 0.01468 | 0.01835 | 0.02203 | 0.02570 | 0.02937 | 0.03304 | 0.03671 |
| 3.7 | 00377 | 00755 | 01132 | 01509 | 01886 | 02264 | 02641 | 03018 | 03396 | 03773 |
| 3.8 | 00387 | 00775 | 01162 | 01550 | 01937 | 02325 | 02712 | 03100 | 03487 | 03875 |
| 3.9 | 00398 | 00795 | 01193 | 01591 | 01988 | 02386 | 02784 | 03182 | 03579 | 03977 |
| 4.0 | 00408 | 00816 | 01224 | 01632 | 02039 | 02447 | 02855 | 03263 | 03671 | 04079 |

# REDUCTION OF THE BAROMETER TO STANDARD GRAVITY.

## ENGLISH MEASURES.

### FROM LATITUDE 0° TO 45°, THE CORRECTION IS TO BE SUBTRACTED.

| Latitude. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 0° | −0.051 | −0.054 | −0.056 | −0.059 | −0.062 | −0.064 | −0.067 | −0.070 | −0.072 | −0.075 | −0.078 | −0.080 |
| 5 | −0.050 | −0.053 | −0.055 | −0.058 | −0.061 | −0.063 | −0.066 | −0.069 | −0.071 | −0.074 | −0.077 | −0.079 |
| 6 | 0.050 | 0.052 | 0.055 | 0.058 | 0.060 | 0.063 | 0.066 | 0.068 | 0.071 | 0.073 | 0.076 | 0.079 |
| 7 | 0.049 | 0.052 | 0.055 | 0.057 | 0.060 | 0.062 | 0.065 | 0.068 | 0.070 | 0.073 | 0.075 | 0.078 |
| 8 | 0.049 | 0.052 | 0.054 | 0.057 | 0.059 | 0.062 | 0.064 | 0.067 | 0.070 | 0.072 | 0.075 | 0.077 |
| 9 | 0.048 | 0.051 | 0.054 | 0.056 | 0.059 | 0.061 | 0.064 | 0.066 | 0.069 | 0.071 | 0.074 | 0.076 |
| 10 | −0.048 | −0.050 | −0.053 | −0.055 | −0.058 | −0.060 | −0.063 | −0.066 | −0.068 | −0.071 | −0.073 | −0.076 |
| 11 | 0.047 | 0.050 | 0.052 | 0.055 | 0.057 | 0.060 | 0.062 | 0.065 | 0.067 | 0.070 | 0.072 | 0.075 |
| 12 | 0.047 | 0.049 | 0.051 | 0.054 | 0.056 | 0.059 | 0.061 | 0.064 | 0.066 | 0.069 | 0.071 | 0.074 |
| 13 | 0.046 | 0.048 | 0.051 | 0.053 | 0.055 | 0.058 | 0.060 | 0.063 | 0.065 | 0.068 | 0.070 | 0.072 |
| 14 | 0.045 | 0.047 | 0.050 | 0.052 | 0.055 | 0.057 | 0.059 | 0.062 | 0.064 | 0.066 | 0.069 | 0.071 |
| 15 | −0.044 | −0.047 | −0.049 | −0.051 | −0.053 | −0.056 | −0.058 | −0.060 | −0.063 | −0.065 | −0.067 | −0.070 |
| 16 | 0.043 | 0.046 | 0.048 | 0.050 | 0.052 | 0.055 | 0.057 | 0.059 | 0.062 | 0.064 | 0.066 | 0.068 |
| 17 | 0.042 | 0.045 | 0.047 | 0.049 | 0.051 | 0.053 | 0.056 | 0.058 | 0.060 | 0.062 | 0.065 | 0.067 |
| 18 | 0.041 | 0.044 | 0.046 | 0.048 | 0.050 | 0.052 | 0.054 | 0.057 | 0.059 | 0.061 | 0.063 | 0.065 |
| 19 | 0.040 | 0.042 | 0.045 | 0.047 | 0.049 | 0.051 | 0.053 | 0.055 | 0.057 | 0.059 | 0.062 | 0.064 |
| 20 | −0.039 | −0.041 | −0.043 | −0.045 | −0.047 | −0.050 | −0.052 | −0.054 | −0.056 | −0.058 | −0.060 | −0.062 |
| 21 | 0.038 | 0.040 | 0.042 | 0.044 | 0.046 | 0.048 | 0.050 | 0.052 | 0.054 | 0.056 | 0.058 | 0.060 |
| 22 | 0.037 | 0.039 | 0.041 | 0.043 | 0.045 | 0.047 | 0.049 | 0.050 | 0.052 | 0.054 | 0.056 | 0.058 |
| 23 | 0.036 | 0.038 | 0.039 | 0.041 | 0.043 | 0.045 | 0.047 | 0.049 | 0.051 | 0.053 | 0.054 | 0.056 |
| 24 | 0.034 | 0.036 | 0.038 | 0.040 | 0.042 | 0.043 | 0.045 | 0.047 | 0.049 | 0.051 | 0.052 | 0.054 |
| 25 | −0.033 | −0.035 | −0.037 | −0.038 | −0.040 | −0.042 | −0.043 | −0.045 | −0.047 | −0.049 | −0.050 | −0.052 |
| 26 | 0.032 | 0.033 | 0.035 | 0.037 | 0.038 | 0.040 | 0.042 | 0.043 | 0.045 | 0.047 | 0.048 | 0.050 |
| 27 | 0.030 | 0.032 | 0.033 | 0.035 | 0.037 | 0.038 | 0.040 | 0.041 | 0.043 | 0.045 | 0.046 | 0.048 |
| 28 | 0.029 | 0.030 | 0.032 | 0.033 | 0.035 | 0.036 | 0.038 | 0.039 | 0.041 | 0.043 | 0.044 | 0.046 |
| 29 | 0.027 | 0.029 | 0.030 | 0.032 | 0.033 | 0.035 | 0.036 | 0.037 | 0.039 | 0.040 | 0.042 | 0.043 |
| 30 | −0.026 | −0.027 | −0.029 | −0.030 | −0.031 | −0.033 | −0.034 | −0.035 | −0.037 | −0.038 | −0.040 | −0.041 |
| 31 | 0.024 | 0.026 | 0.027 | 0.028 | 0.030 | 0.031 | 0.032 | 0.033 | 0.035 | 0.036 | 0.037 | 0.038 |
| 32 | 0.023 | 0.024 | 0.025 | 0.026 | 0.028 | 0.029 | 0.030 | 0.031 | 0.032 | 0.034 | 0.035 | 0.036 |
| 33 | 0.021 | 0.022 | 0.023 | 0.025 | 0.026 | 0.027 | 0.028 | 0.029 | 0.030 | 0.031 | 0.032 | 0.034 |
| 34 | 0.020 | 0.021 | 0.022 | 0.023 | 0.024 | 0.025 | 0.026 | 0.027 | 0.028 | 0.029 | 0.030 | 0.031 |
| 35 | −0.018 | −0.019 | −0.020 | −0.021 | −0.022 | −0.023 | −0.024 | −0.025 | −0.026 | −0.027 | −0.027 | −0.028 |
| 36 | 0.016 | 0.017 | 0.018 | 0.019 | 0.020 | 0.021 | 0.022 | 0.022 | 0.023 | 0.024 | 0.025 | 0.026 |
| 37 | 0.015 | 0.015 | 0.016 | 0.017 | 0.018 | 0.019 | 0.019 | 0.020 | 0.021 | 0.022 | 0.022 | 0.023 |
| 38 | 0.013 | 0.014 | 0.014 | 0.015 | 0.016 | 0.016 | 0.017 | 0.018 | 0.018 | 0.019 | 0.020 | 0.020 |
| 39 | 0.011 | 0.012 | 0.012 | 0.013 | 0.014 | 0.014 | 0.015 | 0.015 | 0.016 | 0.017 | 0.017 | 0.018 |
| 40 | −0.010 | −0.010 | −0.011 | −0.011 | −0.012 | −0.012 | −0.013 | −0.013 | −0.014 | −0.014 | −0.015 | −0.015 |
| 41 | 0.008 | 0.008 | 0.009 | 0.009 | 0.009 | 0.010 | 0.010 | 0.011 | 0.011 | 0.012 | 0.012 | 0.012 |
| 42 | 0.006 | 0.006 | 0.007 | 0.007 | 0.007 | 0.008 | 0.008 | 0.008 | 0.009 | 0.009 | 0.009 | 0.010 |
| 43 | 0.004 | 0.005 | 0.005 | 0.005 | 0.005 | 0.005 | 0.006 | 0.006 | 0.006 | 0.006 | 0.007 | 0.007 |
| 44 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| 45 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |

# REDUCTION OF THE BAROMETER TO STANDARD GRAVITY.

## ENGLISH MEASURES.

FROM LATITUDE 46° TO 90° THE CORRECTION IS TO BE ADDED.

| Latitude. | HEIGHT OF THE BAROMETER IN INCHES. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| 45° | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 | −0.001 |
| 46 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 | +0.001 |
| 47 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.004 | 0.004 | 0.004 | 0.004 | 0.004 |
| 48 | 0.004 | 0.005 | 0.005 | 0.005 | 0.005 | 0.006 | 0.006 | 0.006 | 0.006 | 0.006 | 0.007 | 0.007 |
| 49 | 0.006 | 0.006 | 0.007 | 0.007 | 0.007 | 0.008 | 0.008 | 0.008 | 0.009 | 0.009 | 0.009 | 0.010 |
| 50 | 0.008 | 0.008 | 0.009 | 0.009 | 0.010 | 0.010 | 0.010 | 0.011 | 0.011 | 0.012 | 0.012 | 0.012 |
| 51 | +0.010 | +0.010 | +0.011 | +0.011 | +0.012 | +0.012 | +0.013 | +0.013 | +0.014 | +0.014 | +0.015 | +0.015 |
| 52 | 0.011 | 0.012 | 0.012 | 0.013 | 0.014 | 0.014 | 0.015 | 0.015 | 0.016 | 0.016 | 0.017 | 0.018 |
| 53 | 0.013 | 0.014 | 0.014 | 0.015 | 0.016 | 0.016 | 0.017 | 0.018 | 0.018 | 0.019 | 0.020 | 0.020 |
| 54 | 0.015 | 0.015 | 0.016 | 0.017 | 0.018 | 0.019 | 0.019 | 0.020 | 0.021 | 0.022 | 0.022 | 0.023 |
| 55 | 0.016 | 0.017 | 0.018 | 0.019 | 0.020 | 0.021 | 0.021 | 0.022 | 0.023 | 0.024 | 0.025 | 0.026 |
| 56 | +0.018 | +0.019 | +0.020 | +0.021 | +0.022 | +0.023 | +0.024 | +0.024 | +0.026 | +0.026 | +0.027 | +0.028 |
| 57 | 0.020 | 0.021 | 0.022 | 0.023 | 0.024 | 0.025 | 0.026 | 0.027 | 0.028 | 0.029 | 0.030 | 0.031 |
| 58 | 0.021 | 0.022 | 0.023 | 0.025 | 0.026 | 0.027 | 0.028 | 0.029 | 0.030 | 0.031 | 0.032 | 0.033 |
| 59 | 0.023 | 0.024 | 0.025 | 0.026 | 0.028 | 0.029 | 0.030 | 0.031 | 0.032 | 0.033 | 0.035 | 0.036 |
| 60 | 0.024 | 0.026 | 0.027 | 0.028 | 0.029 | 0.031 | 0.032 | 0.033 | 0.034 | 0.036 | 0.037 | 0.038 |
| 61 | +0.026 | +0.027 | +0.028 | +0.030 | +0.031 | +0.033 | +0.034 | +0.035 | +0.037 | +0.038 | +0.039 | +0.041 |
| 62 | 0.027 | 0.029 | 0.030 | 0.032 | 0.033 | 0.034 | 0.036 | 0.037 | 0.039 | 0.040 | 0.042 | 0.043 |
| 63 | 0.029 | 0.030 | 0.032 | 0.033 | 0.035 | 0.036 | 0.038 | 0.039 | 0.041 | 0.042 | 0.044 | 0.045 |
| 64 | 0.030 | 0.032 | 0.033 | 0.035 | 0.036 | 0.038 | 0.040 | 0.041 | 0.043 | 0.044 | 0.046 | 0.047 |
| 65 | 0.031 | 0.033 | 0.035 | 0.036 | 0.038 | 0.040 | 0.041 | 0.043 | 0.045 | 0.046 | 0.048 | 0.050 |
| 66 | +0.033 | +0.034 | +0.036 | +0.038 | +0.040 | +0.041 | +0.043 | +0.045 | +0.047 | +0.048 | +0.050 | +0.052 |
| 67 | 0.034 | 0.036 | 0.038 | 0.039 | 0.041 | 0.043 | 0.045 | 0.047 | 0.048 | 0.050 | 0.052 | 0.054 |
| 68 | 0.035 | 0.037 | 0.039 | 0.041 | 0.043 | 0.045 | 0.046 | 0.048 | 0.050 | 0.052 | 0.054 | 0.056 |
| 69 | 0.036 | 0.038 | 0.040 | 0.042 | 0.044 | 0.046 | 0.048 | 0.050 | 0.052 | 0.054 | 0.056 | 0.058 |
| 70 | 0.038 | 0.040 | 0.042 | 0.044 | 0.046 | 0.048 | 0.050 | 0.052 | 0.053 | 0.055 | 0.057 | 0.059 |
| 71 | +0.039 | +0.041 | +0.043 | +0.045 | +0.047 | +0.049 | +0.051 | +0.053 | +0.055 | +0.057 | +0.059 | +0.061 |
| 72 | 0.040 | 0.042 | 0.044 | 0.046 | 0.048 | 0.050 | 0.052 | 0.054 | 0.057 | 0.059 | 0.061 | 0.063 |
| 73 | 0.041 | 0.043 | 0.045 | 0.047 | 0.049 | 0.052 | 0.054 | 0.056 | 0.058 | 0.060 | 0.062 | 0.064 |
| 74 | 0.042 | 0.044 | 0.046 | 0.048 | 0.051 | 0.053 | 0.055 | 0.057 | 0.059 | 0.062 | 0.064 | 0.066 |
| 75 | 0.043 | 0.045 | 0.047 | 0.049 | 0.052 | 0.054 | 0.056 | 0.058 | 0.061 | 0.063 | 0.065 | 0.067 |
| 76 | +0.044 | +0.046 | +0.048 | +0.050 | +0.053 | +0.055 | +0.057 | +0.060 | +0.062 | +0.064 | +0.066 | +0.069 |
| 77 | 0.044 | 0.047 | 0.049 | 0.051 | 0.054 | 0.056 | 0.058 | 0.061 | 0.063 | 0.065 | 0.068 | 0.070 |
| 78 | 0.045 | 0.047 | 0.050 | 0.052 | 0.055 | 0.057 | 0.059 | 0.062 | 0.064 | 0.066 | 0.069 | 0.071 |
| 79 | 0.046 | 0.048 | 0.051 | 0.053 | 0.055 | 0.058 | 0.060 | 0.063 | 0.065 | 0.067 | 0.070 | 0.072 |
| 80 | 0.046 | 0.049 | 0.051 | 0.054 | 0.056 | 0.059 | 0.061 | 0.063 | 0.066 | 0.068 | 0.071 | 0.073 |
| 81 | +0.047 | +0.049 | +0.052 | +0.054 | +0.057 | +0.059 | +0.062 | +0.064 | +0.067 | +0.069 | +0.072 | +0.074 |
| 82 | 0.047 | 0.050 | 0.052 | 0.055 | 0.057 | 0.060 | 0.062 | 0.065 | 0.067 | 0.070 | 0.072 | 0.075 |
| 83 | 0.048 | 0.050 | 0.053 | 0.056 | 0.058 | 0.061 | 0.063 | 0.066 | 0.068 | 0.071 | 0.073 | 0.076 |
| 84 | 0.048 | 0.051 | 0.053 | 0.056 | 0.059 | 0.061 | 0.064 | 0.066 | 0.069 | 0.071 | 0.074 | 0.076 |
| 85 | 0.049 | 0.051 | 0.054 | 0.056 | 0.059 | 0.061 | 0.064 | 0.067 | 0.069 | 0.072 | 0.074 | 0.077 |
| 90 | +0.049 | +0.052 | +0.055 | +0.057 | +0.060 | +0.062 | +0.065 | +0.068 | +0.070 | +0.073 | +0.075 | +0.078 |

# REDUCTION OF THE BAROMETER TO STANDARD GRAVITY.

## METRIC MEASURES.

FROM LATITUDE 0° TO 45°, THE CORRECTION IS TO BE SUBTRACTED.

| Latitude. | HEIGHT OF THE BAROMETER IN MILLIMETERS. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 520 | 540 | 560 | 580 | 600 | 620 | 640 | 660 | 680 | 700 | 720 | 740 | 760 | 780 |
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | −1.39 | −1.45 | −1.50 | −1.55 | −1.61 | −1.66 | −1.71 | −1.77 | −1.82 | −1.87 | −1.93 | −1.98 | −2.04 | −2.09 |
| 5 | −1.37 | −1.42 | −1.48 | −1.53 | −1.58 | −1.64 | −1.69 | −1.74 | −1.79 | −1.85 | −1.90 | −1.95 | −2.00 | −2.06 |
| 6 | 1.36 | 1.42 | 1.47 | 1.52 | 1.57 | 1.63 | 1.68 | 1.73 | 1.78 | 1.83 | 1.89 | 1.94 | 1.99 | 2.04 |
| 7 | 1.35 | 1.40 | 1.46 | 1.51 | 1.56 | 1.61 | 1.66 | 1.72 | 1.77 | 1.82 | 1.87 | 1.92 | 1.98 | 2.03 |
| 8 | 1.34 | 1.39 | 1.44 | 1.49 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.91 | 1.96 | 2.01 |
| 9 | 1.33 | 1.38 | 1.43 | 1.48 | 1.53 | 1.58 | 1.63 | 1.68 | 1.73 | 1.78 | 1.84 | 1.89 | 1.94 | 1.99 |
| 10 | −1.31 | −1.36 | −1.41 | −1.46 | −1.51 | −1.56 | −1.61 | −1.66 | −1.71 | −1.76 | −1.81 | −1.86 | −1.92 | −1.97 |
| 11 | 1.29 | 1.34 | 1.39 | 1.44 | 1.49 | 1.54 | 1.59 | 1.64 | 1.69 | 1.74 | 1.79 | 1.84 | 1.89 | 1.94 |
| 12 | 1.27 | 1.32 | 1.37 | 1.42 | 1.47 | 1.52 | 1.57 | 1.62 | 1.67 | 1.72 | 1.76 | 1.81 | 1.86 | 1.91 |
| 13 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.54 | 1.59 | 1.64 | 1.69 | 1.74 | 1.78 | 1.83 | 1.88 |
| 14 | 1.23 | 1.28 | 1.33 | 1.38 | 1.42 | 1.47 | 1.52 | 1.56 | 1.61 | 1.66 | 1.71 | 1.75 | 1.80 | 1.85 |
| 15 | −1.21 | −1.26 | −1.30 | −1.35 | −1.40 | −1.44 | −1.49 | −1.54 | −1.58 | −1.63 | −1.67 | −1.72 | −1.77 | −1.81 |
| 16 | 1.19 | 1.23 | 1.28 | 1.32 | 1.37 | 1.41 | 1.46 | 1.50 | 1.55 | 1.60 | 1.64 | 1.69 | 1.73 | 1.78 |
| 17 | 1.16 | 1.20 | 1.25 | 1.29 | 1.34 | 1.38 | 1.43 | 1.47 | 1.52 | 1.56 | 1.60 | 1.65 | 1.69 | 1.74 |
| 18 | 1.13 | 1.18 | 1.22 | 1.26 | 1.31 | 1.35 | 1.39 | 1.44 | 1.48 | 1.52 | 1.57 | 1.61 | 1.65 | 1.70 |
| 19 | 1.10 | 1.15 | 1.19 | 1.23 | 1.27 | 1.32 | 1.36 | 1.40 | 1.44 | 1.48 | 1.53 | 1.57 | 1.61 | 1.65 |
| 20 | −1.07 | −1.11 | −1.16 | −1.20 | −1.24 | −1.28 | −1.32 | −1.36 | −1.40 | −1.44 | −1.49 | −1.53 | −1.57 | −1.61 |
| 21 | 1.04 | 1.08 | 1.12 | 1.16 | 1.20 | 1.24 | 1.28 | 1.32 | 1.36 | 1.40 | 1.44 | 1.48 | 1.52 | 1.56 |
| 22 | 1.01 | 1.05 | 1.09 | 1.13 | 1.16 | 1.20 | 1.24 | 1.28 | 1.32 | 1.36 | 1.40 | 1.44 | 1.48 | 1.51 |
| 23 | 0.98 | 1.01 | 1.05 | 1.09 | 1.13 | 1.16 | 1.20 | 1.24 | 1.28 | 1.31 | 1.35 | 1.39 | 1.43 | 1.46 |
| 24 | 0.94 | 0.98 | 1.01 | 1.05 | 1.08 | 1.12 | 1.16 | 1.19 | 1.23 | 1.27 | 1.30 | 1.34 | 1.37 | 1.41 |
| 25 | −0.90 | −0.94 | −0.97 | −1.01 | −1.04 | −1.08 | −1.11 | −1.15 | −1.18 | −1.22 | −1.25 | −1.29 | −1.32 | −1.36 |
| 26 | 0.87 | 0.90 | 0.93 | 0.97 | 1.00 | 1.03 | 1.07 | 1.10 | 1.13 | 1.17 | 1.20 | 1.23 | 1.27 | 1.30 |
| 27 | 0.83 | 0.86 | 0.89 | 0.92 | 0.96 | 0.99 | 1.02 | 1.05 | 1.08 | 1.12 | 1.15 | 1.18 | 1.21 | 1.24 |
| 28 | 0.79 | 0.82 | 0.85 | 0.88 | 0.91 | 0.94 | 0.97 | 1.00 | 1.03 | 1.06 | 1.09 | 1.12 | 1.15 | 1.18 |
| 29 | 0.75 | 0.78 | 0.81 | 0.84 | 0.86 | 0.89 | 0.92 | 0.95 | 0.98 | 1.01 | 1.04 | 1.07 | 1.10 | 1.12 |
| 30 | −0.71 | −0.74 | −0.76 | −0.79 | −0.82 | −0.85 | −0.87 | −0.90 | −0.93 | −0.95 | −0.98 | −1.01 | −1.04 | −1.06 |
| 31 | 0.67 | 0.69 | 0.72 | 0.74 | 0.77 | 0.80 | 0.82 | 0.85 | 0.87 | 0.90 | 0.92 | 0.95 | 0.98 | 1.00 |
| 32 | 0.62 | 0.65 | 0.67 | 0.70 | 0.72 | 0.74 | 0.77 | 0.79 | 0.82 | 0.84 | 0.86 | 0.89 | 0.91 | 0.94 |
| 33 | 0.58 | 0.60 | 0.63 | 0.65 | 0.67 | 0.69 | 0.72 | 0.74 | 0.76 | 0.78 | 0.80 | 0.83 | 0.85 | 0.87 |
| 34 | 0.54 | 0.56 | 0.58 | 0.60 | 0.62 | 0.64 | 0.66 | 0.68 | 0.70 | 0.72 | 0.74 | 0.76 | 0.79 | 0.81 |
| 35 | −0.49 | −0.51 | −0.53 | −0.55 | −0.57 | −0.59 | −0.61 | −0.63 | −0.64 | −0.66 | −0.68 | −0.70 | −0.72 | −0.74 |
| 36 | 0.45 | 0.46 | 0.48 | 0.50 | 0.52 | 0.53 | 0.55 | 0.57 | 0.58 | 0.60 | 0.62 | 0.64 | 0.65 | 0.67 |
| 37 | 0.40 | 0.42 | 0.43 | 0.45 | 0.46 | 0.48 | 0.49 | 0.51 | 0.52 | 0.54 | 0.56 | 0.57 | 0.59 | 0.60 |
| 38 | 0.36 | 0.37 | 0.38 | 0.40 | 0.41 | 0.42 | 0.44 | 0.45 | 0.46 | 0.48 | 0.49 | 0.51 | 0.52 | 0.53 |
| 39 | 0.31 | 0.32 | 0.33 | 0.34 | 0.36 | 0.37 | 0.38 | 0.39 | 0.40 | 0.42 | 0.43 | 0.44 | 0.45 | 0.46 |
| 40 | −0.26 | −0.27 | −0.28 | −0.29 | −0.30 | −0.31 | −0.32 | −0.33 | −0.34 | −0.35 | −0.36 | −0.37 | −0.38 | −0.39 |
| 41 | 0.21 | 0.22 | 0.23 | 0.24 | 0.25 | 0.26 | 0.26 | 0.27 | 0.28 | 0.29 | 0.30 | 0.30 | 0.31 | 0.32 |
| 42 | 0.17 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 | 0.21 | 0.21 | 0.22 | 0.22 | 0.23 | 0.24 | 0.24 | 0.25 |
| 43 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 | 0.14 | 0.15 | 0.15 | 0.16 | 0.16 | 0.16 | 0.17 | 0.17 | 0.18 |
| 44 | 0.07 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.11 |
| 45 | −0.02 | −0.02 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.04 |

## REDUCTION OF THE BAROMETER TO STANDARD GRAVITY.

### METRIC MEASURES.

**FROM LATITUDE 46° TO 90°, THE CORRECTION IS TO BE ADDED.**

| Latitude. | HEIGHT OF THE BAROMETER IN MILLIMETERS. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 520 | 540 | 560 | 580 | 600 | 620 | 640 | 660 | 680 | 700 | 720 | 740 | 760 | 780 |
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 45° | −0.02 | −0.02 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.03 | −0.04 |
| 46 | +0.02 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.03 | +0.04 | +0.04 |
| 47 | 0.07 | 0.08 | 0.08 | 0.08 | 0.08 | 0.09 | 0.09 | 0.09 | 0.09 | 0.10 | 0.10 | 0.10 | 0.10 | 0.11 |
| 48 | 0.12 | 0.12 | 0.13 | 0.13 | 0.14 | 0.14 | 0.15 | 0.15 | 0.16 | 0.16 | 0.17 | 0.17 | 0.18 | 0.18 |
| 49 | 0.17 | 0.17 | 0.18 | 0.19 | 0.19 | 0.20 | 0.21 | 0.21 | 0.22 | 0.23 | 0.23 | 0.24 | 0.25 | 0.25 |
| 50 | 0.22 | 0.22 | 0.23 | 0.24 | 0.25 | 0.26 | 0.26 | 0.27 | 0.28 | 0.29 | 0.30 | 0.31 | 0.31 | 0.32 |
| 51 | +0.26 | +0.27 | +0.28 | +0.29 | +0.30 | +0.31 | +0.32 | +0.33 | +0.34 | +0.35 | +0.36 | +0.37 | +0.38 | +0.39 |
| 52 | 0.31 | 0.32 | 0.33 | 0.34 | 0.36 | 0.37 | 0.38 | 0.39 | 0.40 | 0.42 | 0.43 | 0.44 | 0.45 | 0.46 |
| 53 | 0.36 | 0.37 | 0.38 | 0.40 | 0.41 | 0.42 | 0.44 | 0.45 | 0.46 | 0.48 | 0.49 | 0.51 | 0.52 | 0.53 |
| 54 | 0.40 | 0.42 | 0.43 | 0.45 | 0.46 | 0.48 | 0.49 | 0.51 | 0.52 | 0.54 | 0.56 | 0.57 | 0.59 | 0.60 |
| 55 | 0.45 | 0.46 | 0.48 | 0.50 | 0.52 | 0.53 | 0.55 | 0.57 | 0.58 | 0.60 | 0.62 | 0.64 | 0.65 | 0.67 |
| 56 | +0.49 | +0.51 | +0.53 | +0.55 | +0.57 | +0.59 | +0.60 | +0.62 | +0.64 | +0.66 | +0.68 | +0.70 | +0.72 | +0.74 |
| 57 | 0.54 | 0.56 | 0.58 | 0.60 | 0.62 | 0.64 | 0.66 | 0.68 | 0.70 | 0.72 | 0.74 | 0.76 | 0.78 | 0.80 |
| 58 | 0.58 | 0.60 | 0.62 | 0.65 | 0.67 | 0.69 | 0.71 | 0.74 | 0.76 | 0.78 | 0.80 | 0.82 | 0.85 | 0.87 |
| 59 | 0.62 | 0.65 | 0.67 | 0.69 | 0.72 | 0.74 | 0.77 | 0.79 | 0.81 | 0.84 | 0.86 | 0.89 | 0.91 | 0.93 |
| 60 | 0.66 | 0.69 | 0.72 | 0.74 | 0.77 | 0.79 | 0.82 | 0.84 | 0.87 | 0.89 | 0.92 | 0.94 | 0.97 | 1.00 |
| 61 | +0.71 | +0.73 | +0.76 | +0.79 | +0.81 | +0.84 | +0.87 | +0.89 | +0.92 | +0.95 | +0.98 | +1.00 | +1.03 | +1.06 |
| 62 | 0.74 | 0.77 | 0.80 | 0.83 | 0.85 | 0.88 | 0.91 | 0.94 | 0.97 | 1.00 | 1.02 | 1.05 | 1.08 | 1.11 |
| 63 | 0.78 | 0.81 | 0.85 | 0.88 | 0.91 | 0.94 | 0.97 | 1.00 | 1.03 | 1.06 | 1.09 | 1.12 | 1.15 | 1.18 |
| 64 | 0.82 | 0.85 | 0.89 | 0.92 | 0.95 | 0.98 | 1.01 | 1.04 | 1.08 | 1.11 | 1.14 | 1.17 | 1.20 | 1.23 |
| 65 | 0.86 | 0.89 | 0.93 | 0.96 | 0.99 | 1.03 | 1.06 | 1.09 | 1.13 | 1.16 | 1.19 | 1.22 | 1.26 | 1.29 |
| 66 | +0.90 | +0.93 | +0.97 | +1.00 | +1.04 | +1.07 | +1.10 | +1.14 | +1.17 | +1.21 | +1.24 | +1.28 | +1.31 | +1.35 |
| 67 | 0.93 | 0.97 | 1.00 | 1.04 | 1.08 | 1.11 | 1.15 | 1.18 | 1.22 | 1.25 | 1.29 | 1.33 | 1.36 | 1.40 |
| 68 | 0.97 | 1.00 | 1.04 | 1.08 | 1.11 | 1.15 | 1.19 | 1.23 | 1.26 | 1.30 | 1.34 | 1.37 | 1.41 | 1.45 |
| 69 | 1.00 | 1.04 | 1.08 | 1.11 | 1.15 | 1.19 | 1.23 | 1.27 | 1.31 | 1.34 | 1.38 | 1.42 | 1.46 | 1.50 |
| 70 | 1.03 | 1.07 | 1.11 | 1.15 | 1.19 | 1.23 | 1.27 | 1.31 | 1.35 | 1.39 | 1.43 | 1.47 | 1.51 | 1.55 |
| 71 | +1.06 | +1.10 | +1.14 | +1.18 | +1.22 | +1.26 | +1.31 | +1.35 | +1.39 | +1.43 | +1.47 | +1.51 | +1.55 | +1.59 |
| 72 | 1.09 | 1.13 | 1.17 | 1.22 | 1.26 | 1.30 | 1.34 | 1.38 | 1.42 | 1.47 | 1.51 | 1.55 | 1.59 | 1.63 |
| 73 | 1.12 | 1.16 | 1.20 | 1.25 | 1.29 | 1.33 | 1.37 | 1.42 | 1.46 | 1.50 | 1.55 | 1.59 | 1.63 | 1.67 |
| 74 | 1.14 | 1.19 | 1.23 | 1.28 | 1.32 | 1.36 | 1.41 | 1.45 | 1.50 | 1.54 | 1.58 | 1.63 | 1.67 | 1.72 |
| 75 | 1.17 | 1.21 | 1.26 | 1.30 | 1.35 | 1.39 | 1.44 | 1.48 | 1.53 | 1.57 | 1.62 | 1.66 | 1.71 | 1.75 |
| 76 | +1.19 | +1.24 | +1.28 | +1.33 | +1.37 | +1.42 | +1.47 | +1.51 | +1.56 | +1.60 | +1.65 | +1.70 | +1.74 | +1.79 |
| 77 | 1.21 | 1.26 | 1.31 | 1.35 | 1.40 | 1.45 | 1.49 | 1.54 | 1.59 | 1.63 | 1.68 | 1.73 | 1.77 | 1.82 |
| 78 | 1.23 | 1.28 | 1.33 | 1.38 | 1.42 | 1.47 | 1.52 | 1.57 | 1.61 | 1.66 | 1.71 | 1.76 | 1.80 | 1.85 |
| 79 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 | 1.49 | 1.54 | 1.59 | 1.64 | 1.69 | 1.73 | 1.78 | 1.83 | 1.88 |
| 80 | 1.27 | 1.32 | 1.37 | 1.42 | .147 | 1.51 | 1.56 | 1.61 | 1.66 | 1.71 | 1.76 | 1.81 | 1.86 | 1.90 |
| 81 | +1.29 | +1.33 | +1.38 | +1.43 | +1.48 | +1.53 | +1.58 | +1.63 | +1.68 | +1.73 | +1.78 | +1.83 | +1.88 | +1.93 |
| 82 | 1.30 | 1.35 | 1.40 | 1.45 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 |
| 83 | 1.31 | 1.36 | 1.41 | 1.46 | 1.51 | 1.56 | 1.61 | 1.67 | 1.72 | 1.77 | 1.82 | 1.87 | 1.92 | 1.97 |
| 84 | 1.32 | 1.37 | 1.42 | 1.48 | 1.53 | 1.58 | 1.63 | 1.68 | 1.73 | 1.78 | 1.83 | 1.88 | 1.93 | 1.98 |
| 85 | 1.33 | 1.38 | 1.43 | 1.49 | 1.54 | 1.59 | 1.64 | 1.69 | 1.74 | 1.79 | 1.84 | 1.90 | 1.95 | 2.00 |
| 90 | +1.35 | +1.41 | +1.46 | +1.51 | +1.56 | +1.61 | +1.67 | +1.72 | +1.77 | +1.82 | +1.87 | +1.93 | +1.98 | +2.03 |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### ENGLISH MEASURES.

Values of $60368\,[1 + 0.0010195 \times 36]\log \dfrac{29.90}{B}$.

| Barometric Pressure. B. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| **12.00** | 24814 | 24791 | 24769 | 24746 | 24723 | 24701 | 24678 | 24656 | 24633 | 24611 |
| 12.10 | 24588 | 24566 | 24543 | 24521 | 24499 | 24476 | 24454 | 24431 | 24409 | 24387 |
| 12.20 | 24365 | 24342 | 24320 | 24298 | 24276 | 24253 | 24231 | 24209 | 24187 | 24165 |
| 12.30 | 24143 | 24121 | 24098 | 24076 | 24054 | 24032 | 24010 | 23988 | 23966 | 23944 |
| 12.40 | 23923 | 23901 | 23879 | 23857 | 23835 | 23813 | 23791 | 23770 | 23748 | 23726 |
| **12.50** | 23704 | 23682 | 23661 | 23639 | 23617 | 23596 | 23574 | 23552 | 23531 | 23509 |
| 12.60 | 23488 | 23466 | 23445 | 23423 | 23402 | 23380 | 23359 | 23337 | 23316 | 23294 |
| 12.70 | 23273 | 23251 | 23230 | 23209 | 23187 | 23166 | 23145 | 23123 | 23102 | 23081 |
| 12.80 | 23060 | 23038 | 23017 | 22996 | 22975 | 22954 | 22933 | 22911 | 22890 | 22869 |
| 12.90 | 22848 | 22827 | 22806 | 22785 | 22764 | 22743 | 22722 | 22701 | 22680 | 22659 |
| **13.00** | 22638 | 22617 | 22596 | 22576 | 22555 | 22534 | 22513 | 22492 | 22471 | 22451 |
| 13.10 | 22430 | 22409 | 22388 | 22368 | 22347 | 22326 | 22306 | 22285 | 22264 | 22244 |
| 13.20 | 22223 | 22203 | 22182 | 22162 | 22141 | 22121 | 22100 | 22080 | 22059 | 22039 |
| 13.30 | 22018 | 21998 | 21977 | 21957 | 21937 | 21916 | 21896 | 21876 | 21855 | 21835 |
| 13.40 | 21815 | 21794 | 21774 | 21754 | 21734 | 21713 | 21693 | 21673 | 21653 | 21633 |
| **13.50** | 21612 | 21592 | 21572 | 21552 | 21532 | 21512 | 21492 | 21472 | 21452 | 21432 |
| 13.60 | 21412 | 21392 | 21372 | 21352 | 21332 | 21312 | 21292 | 21272 | 21252 | 21233 |
| 13.70 | 21213 | 21193 | 21173 | 21153 | 21134 | 21114 | 21094 | 21074 | 21054 | 21035 |
| 13.80 | 21015 | 20995 | 20976 | 20956 | 20936 | 20917 | 20897 | 20878 | 20858 | 20838 |
| 13.90 | 20819 | 20799 | 20780 | 20760 | 20741 | 20721 | 20702 | 20682 | 20663 | 20643 |
| **14.00** | 20624 | 20605 | 20585 | 20566 | 20546 | 20527 | 20508 | 20488 | 20469 | 20450 |
| 14.10 | 20431 | 20411 | 20392 | 20373 | 20354 | 20334 | 20315 | 20296 | 20277 | 20258 |
| 14.20 | 20238 | 20219 | 20200 | 20181 | 20162 | 20143 | 20124 | 20105 | 20086 | 20067 |
| 14.30 | 20048 | 20029 | 20010 | 19991 | 19972 | 19953 | 19934 | 19915 | 19896 | 19877 |
| 14.40 | 19858 | 19839 | 19821 | 19802 | 19783 | 19764 | 19745 | 19727 | 19708 | 19689 |
| **14.50** | 19670 | 19651 | 19633 | 19614 | 19595 | 19577 | 19558 | 19539 | 19521 | 19502 |
| 14.60 | 19483 | 19465 | 19446 | 19428 | 19409 | 19390 | 19372 | 19353 | 19335 | 19316 |
| 14.70 | 19298 | 19279 | 19261 | 19242 | 19224 | 19206 | 19187 | 19169 | 19150 | 19132 |
| 14.80 | 19114 | 19095 | 19077 | 19059 | 19040 | 19022 | 19004 | 18985 | 18967 | 18949 |
| 14.90 | 18931 | 18912 | 18894 | 18876 | 18858 | 18840 | 18821 | 18803 | 18785 | 18767 |
| **15.00** | 18749 | 18731 | 18713 | 18694 | 18676 | 18658 | 18640 | 18622 | 18604 | 18586 |
| 15.10 | 18568 | 18550 | 18532 | 18514 | 18496 | 18478 | 18460 | 18442 | 18425 | 18407 |
| 15.20 | 18389 | 18371 | 18353 | 18335 | 18317 | 18300 | 18282 | 18264 | 18246 | 18228 |
| 15.30 | 18211 | 18193 | 18175 | 18157 | 18140 | 18122 | 18104 | 18086 | 18069 | 18051 |
| 15.40 | 18033 | 18016 | 17998 | 17981 | 17963 | 17945 | 17928 | 17910 | 17893 | 17875 |
| **15.50** | 17858 | 17840 | 17823 | 17805 | 17788 | 17770 | 17753 | 17735 | 17718 | 17700 |
| 15.60 | 17683 | 17665 | 17648 | 17631 | 17613 | 17596 | 17578 | 17561 | 17544 | 17526 |
| 15.70 | 17509 | 17492 | 17474 | 17457 | 17440 | 17423 | 17405 | 17388 | 17371 | 17354 |
| 15.80 | 17337 | 17319 | 17302 | 17285 | 17268 | 17251 | 17234 | 17216 | 17199 | 17182 |
| 15.90 | 17165 | 17148 | 17131 | 17114 | 17097 | 17080 | 17063 | 17046 | 17029 | 17012 |
| **16.00** | 16995 | 16978 | 16961 | 16944 | 16927 | 16910 | 16893 | 16876 | 16859 | 16842 |
| 16.10 | 16825 | 16808 | 16792 | 16775 | 16758 | 16741 | 16724 | 16707 | 16691 | 16674 |
| 16.20 | 16657 | 16640 | 16623 | 16607 | 16590 | 16573 | 16557 | 16540 | 16523 | 16506 |
| 16.30 | 16490 | 16473 | 16456 | 16440 | 16423 | 16406 | 16390 | 16373 | 16357 | 16340 |
| 16.40 | 16324 | 16307 | 16290 | 16274 | 16257 | 16241 | 16224 | 16208 | 16191 | 16175 |
| **16.50** | 16158 | 16142 | 16125 | 16109 | 16092 | 16076 | 16060 | 16043 | 16027 | 16010 |
| 16.60 | 15994 | 15978 | 15961 | 15945 | 15929 | 15912 | 15896 | 15880 | 15863 | 15847 |
| 16.70 | 15831 | 15815 | 15798 | 15782 | 15766 | 15750 | 15733 | 15717 | 15701 | 15685 |
| 16.80 | 15669 | 15652 | 15636 | 15620 | 15604 | 15588 | 15572 | 15556 | 15539 | 15523 |
| 16.90 | 15507 | 15491 | 15475 | 15459 | 15443 | 15427 | 15411 | 15395 | 15379 | 15363 |
| **17.00** | 15347 | 15331 | 15315 | 15299 | 15283 | 15267 | 15251 | 15235 | 15219 | 15203 |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### ENGLISH MEASURES.

Values of $60368\ [1 + 0.0010195 \times 36]\ \log \frac{29.90}{B}$.

| Barometric Pressure. B. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| **17.00** | 15347 | 15331 | 15315 | 15299 | 15283 | 15267 | 15251 | 15235 | 15219 | 15203 |
| 17.10 | 15187 | 15172 | 15156 | 15140 | 15124 | 15108 | 15092 | 15076 | 15061 | 15045 |
| 17.20 | 15029 | 15013 | 14997 | 14982 | 14966 | 14950 | 14934 | 14919 | 14903 | 14887 |
| 17.30 | 14871 | 14856 | 14840 | 14824 | 14809 | 14793 | 14777 | 14762 | 14746 | 14730 |
| 17.40 | 14715 | 14699 | 14684 | 14668 | 14652 | 14637 | 14621 | 14606 | 14590 | 14575 |
| **17.50** | 14559 | 14544 | 14528 | 14512 | 14497 | 14481 | 14466 | 14451 | 14435 | 14420 |
| 17.60 | 14404 | 14389 | 14373 | 14358 | 14342 | 14327 | 14312 | 14296 | 14281 | 14266 |
| 17.70 | 14250 | 14235 | 14219 | 14204 | 14189 | 14173 | 14158 | 14143 | 14128 | 14112 |
| 17.80 | 14097 | 14082 | 14067 | 14051 | 14036 | 14021 | 14006 | 13990 | 13975 | 13960 |
| 17.90 | 13945 | 13930 | 13914 | 13899 | 13884 | 13869 | 13854 | 13839 | 13824 | 13808 |
| **18.00** | 13793 | 13778 | 13763 | 13748 | 13733 | 13718 | 13703 | 13688 | 13673 | 13658 |
| 18.10 | 13643 | 13628 | 13613 | 13598 | 13583 | 13568 | 13553 | 13538 | 13523 | 13508 |
| 18.20 | 13493 | 13478 | 13463 | 13448 | 13433 | 13418 | 13404 | 13389 | 13374 | 13359 |
| 18.30 | 13344 | 13329 | 13314 | 13300 | 13285 | 13270 | 13255 | 13240 | 13226 | 13211 |
| 18.40 | 13196 | 13181 | 13166 | 13152 | 13137 | 13122 | 13107 | 13093 | 13078 | 13063 |
| **18.50** | 13049 | 13034 | 13019 | 13005 | 12990 | 12975 | 12961 | 12946 | 12931 | 12917 |
| 18.60 | 12902 | 12888 | 12873 | 12858 | 12844 | 12829 | 12815 | 12800 | 12785 | 12771 |
| 18.70 | 12756 | 12742 | 12727 | 12713 | 12698 | 12684 | 12669 | 12655 | 12640 | 12626 |
| 18.80 | 12611 | 12597 | 12583 | 12568 | 12554 | 12539 | 12525 | 12510 | 12496 | 12482 |
| 18.90 | 12467 | 12453 | 12438 | 12424 | 12410 | 12395 | 12381 | 12367 | 12352 | 12338 |
| **19.00** | 12324 | 12310 | 12295 | 12281 | 12267 | 12252 | 12238 | 12224 | 12210 | 12195 |
| 19.10 | 12181 | 12167 | 12153 | 12138 | 12124 | 12110 | 12096 | 12082 | 12068 | 12053 |
| 19.20 | 12039 | 12025 | 12011 | 11997 | 11983 | 11969 | 11954 | 11940 | 11926 | 11912 |
| 19.30 | 11898 | 11884 | 11870 | 11856 | 11842 | 11828 | 11814 | 11800 | 11786 | 11772 |
| 19.40 | 11758 | 11744 | 11730 | 11716 | 11702 | 11688 | 11674 | 11660 | 11646 | 11632 |
| **19.50** | 11618 | 11604 | 11590 | 11576 | 11562 | 11548 | 11534 | 11520 | 11507 | 11493 |
| 19.60 | 11479 | 11465 | 11451 | 11437 | 11423 | 11410 | 11396 | 11382 | 11368 | 11354 |
| 19.70 | 11340 | 11327 | 11313 | 11299 | 11285 | 11272 | 11258 | 11244 | 11230 | 11217 |
| 19.80 | 11203 | 11189 | 11175 | 11162 | 11148 | 11134 | 11121 | 11107 | 11093 | 11080 |
| 19.90 | 11066 | 11052 | 11039 | 11025 | 11011 | 10998 | 10984 | 10970 | 10957 | 10943 |
| **20.00** | 10930 | 10916 | 10903 | 10889 | 10875 | 10862 | 10848 | 10835 | 10821 | 10808 |
| 20.10 | 10794 | 10781 | 10767 | 10754 | 10740 | 10727 | 10713 | 10700 | 10686 | 10673 |
| 20.20 | 10659 | 10646 | 10632 | 10619 | 10605 | 10592 | 10579 | 10565 | 10552 | 10538 |
| 20.30 | 10525 | 10512 | 10498 | 10485 | 10472 | 10458 | 10445 | 10431 | 10418 | 10405 |
| 20.40 | 10391 | 10378 | 10365 | 10352 | 10338 | 10325 | 10312 | 10298 | 10285 | 10272 |
| **20.50** | 10259 | 10245 | 10232 | 10219 | 10206 | 10192 | 10179 | 10166 | 10153 | 10139 |
| 20.60 | 10126 | 10113 | 10100 | 10087 | 10074 | 10060 | 10047 | 10034 | 10021 | 10008 |
| 20.70 | 9995 | 9982 | 9968 | 9955 | 9942 | 9929 | 9916 | 9903 | 9890 | 9877 |
| 20.80 | 9864 | 9851 | 9838 | 9825 | 9812 | 9799 | 9786 | 9772 | 9759 | 9746 |
| 20.90 | 9733 | 9720 | 9707 | 9694 | 9681 | 9668 | 9655 | 9642 | 9629 | 9617 |
| **21.00** | 9604 | 9591 | 9578 | 9565 | 9552 | 9539 | 9526 | 9513 | 9500 | 9487 |
| 21.10 | 9474 | 9462 | 9449 | 9436 | 9423 | 9410 | 9397 | 9384 | 9372 | 9359 |
| 21.20 | 9346 | 9333 | 9320 | 9307 | 9295 | 9282 | 9269 | 9256 | 9244 | 9231 |
| 21.30 | 9218 | 9205 | 9193 | 9180 | 9167 | 9154 | 9142 | 9129 | 9116 | 9103 |
| 21.40 | 9091 | 9078 | 9065 | 9053 | 9040 | 9027 | 9015 | 9002 | 8989 | 8977 |
| **21.50** | 8964 | 8951 | 8939 | 8926 | 8913 | 8901 | 8888 | 8876 | 8863 | 8850 |
| 21.60 | 8838 | 8825 | 8813 | 8800 | 8788 | 8775 | 8762 | 8750 | 8737 | 8725 |
| 21.70 | 8712 | 8700 | 8687 | 8675 | 8662 | 8650 | 8637 | 8625 | 8612 | 8600 |
| 21.80 | 8587 | 8575 | 8562 | 8550 | 8538 | 8525 | 8513 | 8500 | 8488 | 8475 |
| 21.90 | 8463 | 8451 | 8438 | 8426 | 8413 | 8401 | 8389 | 8376 | 8364 | 8352 |
| **22.00** | 8339 | 8327 | 8314 | 8302 | 8290 | 8277 | 8265 | 8253 | 8240 | 8228 |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

ENGLISH MEASURES.

Values of $60368\ [1 + 0.0010195 \times 36]\ \log \frac{29.90}{B}$.

| Barometric Pressure. B. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| **22.00** | 8339 | 8327 | 8314 | 8302 | 8290 | 8277 | 8265 | 8253 | 8240 | 8228 |
| 22.10 | 8216 | 8204 | 8191 | 8179 | 8167 | 8154 | 8142 | 8130 | 8118 | 8105 |
| 22.20 | 8093 | 8081 | 8069 | 8056 | 8044 | 8032 | 8020 | 8008 | 7995 | 7983 |
| 22.30 | 7971 | 7959 | 7947 | 7935 | 7922 | 7910 | 7898 | 7886 | 7874 | 7862 |
| 22.40 | 7849 | 7837 | 7825 | 7813 | 7801 | 7789 | 7777 | 7765 | 7753 | 7740 |
| **22.50** | 7728 | 7716 | 7704 | 7692 | 7680 | 7668 | 7656 | 7644 | 7632 | 7620 |
| 22.60 | 7608 | 7596 | 7584 | 7572 | 7560 | 7548 | 7536 | 7524 | 7512 | 7500 |
| 22.70 | 7488 | 7476 | 7464 | 7452 | 7440 | 7428 | 7416 | 7404 | 7392 | 7380 |
| 22.80 | 7368 | 7356 | 7345 | 7333 | 7321 | 7309 | 7297 | 7285 | 7273 | 7261 |
| 22.90 | 7249 | 7238 | 7226 | 7214 | 7202 | 7190 | 7178 | 7166 | 7155 | 7143 |
| **23.00** | 7131 | 7119 | 7107 | 7096 | 7084 | 7072 | 7060 | 7048 | 7037 | 7025 |
| 23.10 | 7013 | 7001 | 6990 | 6978 | 6966 | 6954 | 6943 | 6931 | 6919 | 6907 |
| 23.20 | 6896 | 6884 | 6872 | 6861 | 6849 | 6837 | 6825 | 6814 | 6802 | 6790 |
| 23.30 | 6779 | 6767 | 6755 | 6744 | 6732 | 6721 | 6709 | 6697 | 6686 | 6674 |
| 23.40 | 6662 | 6651 | 6639 | 6628 | 6616 | 6604 | 6593 | 6581 | 6570 | 6558 |
| **23.50** | 6546 | 6535 | 6523 | 6512 | 6500 | 6489 | 6477 | 6466 | 6454 | 6443 |
| 23.60 | 6431 | 6420 | 6408 | 6397 | 6385 | 6374 | 6362 | 6351 | 6339 | 6328 |
| 23.70 | 6316 | 6305 | 6293 | 6282 | 6270 | 6259 | 6247 | 6236 | 6225 | 6213 |
| 23.80 | 6202 | 6190 | 6179 | 6167 | 6156 | 6145 | 6133 | 6122 | 6110 | 6099 |
| 23.90 | 6088 | 6076 | 6065 | 6054 | 6042 | 6031 | 6020 | 6008 | 5997 | 5986 |
| **24.00** | 5974 | 5963 | 5952 | 5940 | 5929 | 5918 | 5906 | 5895 | 5884 | 5872 |
| 24.10 | 5861 | 5850 | 5839 | 5827 | 5816 | 5805 | 5794 | 5782 | 5771 | 5760 |
| 24.20 | 5749 | 5737 | 5726 | 5715 | 5704 | 5693 | 5681 | 5670 | 5659 | 5648 |
| 24.30 | 5637 | 5625 | 5614 | 5603 | 5592 | 5581 | 5570 | 5558 | 5547 | 5536 |
| 24.40 | 5525 | 5514 | 5503 | 5492 | 5480 | 5469 | 5458 | 5447 | 5436 | 5425 |
| **24.50** | 5414 | 5403 | 5392 | 5381 | 5369 | 5358 | 5347 | 5336 | 5325 | 5314 |
| 24.60 | 5303 | 5292 | 5281 | 5270 | 5259 | 5248 | 5237 | 5226 | 5215 | 5204 |
| 24.70 | 5193 | 5182 | 5171 | 5160 | 5149 | 5138 | 5127 | 5116 | 5105 | 5094 |
| 24.80 | 5083 | 5072 | 5061 | 5050 | 5039 | 5028 | 5017 | 5006 | 4995 | 4985 |
| 24.90 | 4974 | 4963 | 4952 | 4941 | 4930 | 4919 | 4908 | 4897 | 4886 | 4876 |
| **25.00** | 4865 | 4854 | 4843 | 4832 | 4821 | 4810 | 4800 | 4789 | 4778 | 4767 |
| 25.10 | 4756 | 4745 | 4735 | 4724 | 4713 | 4702 | 4691 | 4681 | 4670 | 4659 |
| 25.20 | 4648 | 4637 | 4627 | 4616 | 4605 | 4594 | 4584 | 4573 | 4562 | 4551 |
| 25.30 | 4540 | 4530 | 4519 | 4508 | 4498 | 4487 | 4476 | 4465 | 4455 | 4444 |
| 25.40 | 4433 | 4423 | 4412 | 4401 | 4391 | 4380 | 4369 | 4358 | 4348 | 4337 |
| **25.50** | 4326 | 4316 | 4305 | 4295 | 4284 | 4273 | 4263 | 4252 | 4241 | 4231 |
| 25.60 | 4220 | 4209 | 4199 | 4188 | 4178 | 4167 | 4156 | 4146 | 4135 | 4125 |
| 25.70 | 4114 | 4104 | 4093 | 4082 | 4072 | 4061 | 4051 | 4040 | 4030 | 4019 |
| 25.80 | 4009 | 3998 | 3988 | 3977 | 3966 | 3956 | 3945 | 3935 | 3924 | 3914 |
| 25.90 | 3903 | 3893 | 3882 | 3872 | 3861 | 3851 | 3841 | 3830 | 3820 | 3809 |
| **26.00** | 3799 | 3788 | 3778 | 3767 | 3757 | 3746 | 3736 | 3726 | 3715 | 3705 |
| 26.10 | 3694 | 3684 | 3674 | 3663 | 3653 | 3642 | 3632 | 3622 | 3611 | 3601 |
| 26.20 | 3590 | 3580 | 3570 | 3559 | 3549 | 3539 | 3528 | 3518 | 3508 | 3497 |
| 26.30 | 3487 | 3477 | 3466 | 3456 | 3446 | 3435 | 3425 | 3415 | 3404 | 3394 |
| 26.40 | 3384 | 3373 | 3363 | 3353 | 3343 | 3332 | 3322 | 3312 | 3301 | 3291 |
| **26.50** | 3281 | 3270 | 3260 | 3250 | 3240 | 3230 | 3219 | 3209 | 3199 | 3189 |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### ENGLISH MEASURES.

Values of $60368\,[1+0.0010195 \times 36] \log \frac{29.90}{B}$.

| Barometric Pressure. B. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| Inches. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| **26.50** | 3281 | 3270 | 3260 | 3250 | 3240 | 3230 | 3219 | 3209 | 3199 | 3189 |
| 26.60 | 3179 | 3168 | 3158 | 3148 | 3138 | 3128 | 3117 | 3107 | 3097 | 3087 |
| 26.70 | 3077 | 3066 | 3056 | 3046 | 3036 | 3026 | 3016 | 3005 | 2995 | 2985 |
| 26.80 | 2975 | 2965 | 2955 | 2945 | 2934 | 2924 | 2914 | 2904 | 2894 | 2884 |
| 26.90 | 2874 | 2864 | 2854 | 2843 | 2833 | 2823 | 2813 | 2803 | 2793 | 2783 |
| **27.00** | 2773 | 2763 | 2753 | 2743 | 2733 | 2723 | 2713 | 2703 | 2692 | 2682 |
| 27.10 | 2672 | 2662 | 2652 | 2642 | 2632 | 2622 | 2612 | 2602 | 2592 | 2582 |
| 27.20 | 2572 | 2562 | 2552 | 2542 | 2532 | 2522 | 2512 | 2502 | 2493 | 2483 |
| 27.30 | 2473 | 2463 | 2453 | 2443 | 2433 | 2423 | 2413 | 2403 | 2393 | 2383 |
| 27.40 | 2373 | 2363 | 2353 | 2343 | 2334 | 2324 | 2314 | 2304 | 2294 | 2284 |
| **27.50** | 2274 | 2264 | 2254 | 2245 | 2235 | 2225 | 2215 | 2205 | 2195 | 2185 |
| 27.60 | 2176 | 2166 | 2156 | 2146 | 2136 | 2126 | 2116 | 2107 | 2097 | 2087 |
| 27.70 | 2077 | 2067 | 2058 | 2048 | 2038 | 2028 | 2018 | 2009 | 1999 | 1989 |
| 27.80 | 1979 | 1970 | 1960 | 1950 | 1940 | 1930 | 1921 | 1911 | 1901 | 1891 |
| 27.90 | 1882 | 1872 | 1862 | 1852 | 1843 | 1833 | 1823 | 1814 | 1804 | 1794 |
| **28.00** | 1784 | 1775 | 1765 | 1755 | 1746 | 1736 | 1726 | 1717 | 1707 | 1697 |
| 28.10 | 1688 | 1678 | 1668 | 1659 | 1649 | 1639 | 1630 | 1620 | 1610 | 1601 |
| 28.20 | 1591 | 1581 | 1572 | 1562 | 1552 | 1543 | 1533 | 1524 | 1514 | 1504 |
| 28.30 | 1495 | 1485 | 1476 | 1466 | 1456 | 1447 | 1437 | 1428 | 1418 | 1408 |
| 28.40 | 1399 | 1389 | 1380 | 1370 | 1361 | 1351 | 1342 | 1332 | 1322 | 1313 |
| **28.50** | 1303 | 1294 | 1284 | 1275 | 1265 | 1256 | 1246 | 1237 | 1227 | 1218 |
| 28.60 | 1208 | 1199 | 1189 | 1180 | 1170 | 1161 | 1151 | 1142 | 1132 | 1123 |
| 28.70 | 1113 | 1104 | 1094 | 1085 | 1075 | 1066 | 1057 | 1047 | 1038 | 1028 |
| 28.80 | 1019 | 1009 | 1000 | 990 | 981 | 972 | 962 | 953 | 943 | 934 |
| 28.90 | 925 | 915 | 906 | 896 | 887 | 878 | 868 | 859 | 849 | 840 |
| **29.00** | 831 | 821 | 812 | 803 | 793 | 784 | 775 | 765 | 756 | 746 |
| 29.10 | 737 | 728 | 718 | 709 | 700 | 690 | 681 | 672 | 663 | 653 |
| 29.20 | 644 | 635 | 625 | 616 | 607 | 597 | 588 | 579 | 570 | 560 |
| 29.30 | 551 | 542 | 532 | 523 | 514 | 505 | 495 | 486 | 477 | 468 |
| 29.40 | 458 | 449 | 440 | 431 | 421 | 412 | 403 | 394 | 384 | 375 |
| **29.50** | 366 | 357 | 348 | 338 | 329 | 320 | 311 | 302 | 292 | 283 |
| 29.60 | 274 | 265 | 256 | 247 | 237 | 228 | 219 | 210 | 201 | 192 |
| 29.70 | 182 | 173 | 164 | 155 | 146 | 137 | 128 | 118 | 109 | 100 |
| 29.80 | + 91 | + 82 | + 73 | + 64 | + 55 | + 45 | + 36 | + 27 | + 18 | + 9 |
| 29.90 | 0 | − 9 | − 18 | − 27 | − 36 | − 45 | − 55 | − 64 | − 73 | − 82 |
| **30.00** | − 91 | − 100 | − 109 | − 118 | − 127 | − 136 | − 145 | − 154 | − 163 | − 172 |
| 30.10 | − 181 | − 190 | − 199 | − 208 | − 217 | − 226 | − 235 | − 244 | − 253 | − 262 |
| 30.20 | − 271 | − 280 | − 289 | − 298 | − 307 | − 316 | − 325 | − 334 | − 343 | − 352 |
| 30.30 | − 361 | − 370 | − 379 | − 388 | − 397 | − 406 | − 415 | − 424 | − 433 | − 442 |
| 30.40 | − 451 | − 460 | − 469 | − 478 | − 486 | − 495 | − 504 | − 513 | − 522 | − 531 |
| **30.50** | − 540 | − 549 | − 558 | − 567 | − 576 | − 585 | − 593 | − 602 | − 611 | − 620 |
| 30.60 | − 629 | − 638 | − 647 | − 656 | − 665 | − 673 | − 682 | − 691 | − 700 | − 709 |
| 30.70 | − 718 | − 727 | − 735 | − 744 | − 753 | − 762 | − 771 | − 780 | − 788 | − 797 |
| 30.80 | − 806 | − 815 | − 824 | − 833 | − 841 | − 850 | − 859 | − 868 | − 877 | − 885 |

TABLE 52.

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### ENGLISH MEASURES.

**Term for Temperature:** $0.002039\ (\theta - 50^\circ)\ z.$

For temperatures { above 50° F. / below 50° F. } the values are to be { added. / subtracted.

| Mean Temperature. θ. | | APPROXIMATE DIFFERENCE OF HEIGHT OBTAINED FROM TABLE 51. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 20 | 40 | 60 | 80 | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 |
| F. | F. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 49° | 51° | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| 48 | 52 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 |
| 47 | 53 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 6 |
| 46 | 54 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 7 | 7 |
| 45 | 55 | 0 | 0 | 1 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 44 | 56 | 0 | 0 | 1 | 1 | 1 | 2 | 4 | 5 | 6 | 7 | 9 | 10 | 11 |
| 43 | 57 | 0 | 1 | 1 | 1 | 1 | 3 | 4 | 6 | 7 | 9 | 10 | 11 | 13 |
| 42 | 58 | 0 | 1 | 1 | 1 | 2 | 3 | 5 | 7 | 8 | 10 | 11 | 13 | 15 |
| 41 | 59 | 0 | 1 | 1 | 1 | 2 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 |
| 40 | 60 | 0 | 1 | 1 | 2 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 |
| 39 | 61 | 0 | 1 | 1 | 2 | 2 | 4 | 7 | 9 | 11 | 13 | 16 | 18 | 20 |
| 38 | 62 | 0 | 1 | 1 | 2 | 2 | 5 | 7 | 10 | 12 | 15 | 17 | 20 | 22 |
| 37 | 63 | 1 | 1 | 2 | 2 | 3 | 5 | 8 | 11 | 13 | 16 | 19 | 21 | 24 |
| 36 | 64 | 1 | 1 | 2 | 2 | 3 | 6 | 9 | 11 | 14 | 17 | 20 | 23 | 26 |
| 35 | 65 | 1 | 1 | 2 | 2 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 28 |
| 34 | 66 | 1 | 1 | 2 | 3 | 3 | 7 | 10 | 13 | 16 | 20 | 23 | 26 | 29 |
| 33 | 67 | 1 | 1 | 2 | 3 | 3 | 7 | 10 | 14 | 17 | 21 | 24 | 28 | 31 |
| 32 | 68 | 1 | 1 | 2 | 3 | 4 | 7 | 11 | 15 | 18 | 22 | 26 | 29 | 33 |
| 31 | 69 | 1 | 2 | 2 | 3 | 4 | 8 | 12 | 15 | 19 | 23 | 27 | 31 | 35 |
| 30 | 70 | 1 | 2 | 2 | 3 | 4 | 8 | 12 | 16 | 20 | 24 | 29 | 33 | 37 |
| 29 | 71 | 1 | 2 | 3 | 3 | 4 | 9 | 13 | 17 | 21 | 26 | 30 | 34 | 39 |
| 28 | 72 | 1 | 2 | 3 | 4 | 4 | 9 | 13 | 18 | 22 | 27 | 31 | 36 | 40 |
| 27 | 73 | 1 | 2 | 3 | 4 | 5 | 9 | 14 | 19 | 23 | 28 | 33 | 38 | 42 |
| 26 | 74 | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 | 24 | 29 | 34 | 39 | 44 |
| 25 | 75 | 1 | 2 | 3 | 4 | 5 | 10 | 15 | 20 | 25 | 31 | 36 | 41 | 46 |
| 24 | 76 | 1 | 2 | 3 | 4 | 5 | 11 | 16 | 21 | 27 | 32 | 37 | 42 | 48 |
| 23 | 77 | 1 | 2 | 3 | 4 | 6 | 11 | 17 | 22 | 28 | 33 | 39 | 44 | 50 |
| 22 | 78 | 1 | 2 | 3 | 5 | 6 | 11 | 17 | 23 | 29 | 34 | 40 | 46 | 51 |
| 21 | 79 | 1 | 2 | 4 | 5 | 6 | 12 | 18 | 24 | 30 | 35 | 41 | 47 | 53 |
| 20 | 80 | 1 | 2 | 4 | 5 | 6 | 12 | 18 | 24 | 31 | 37 | 43 | 49 | 55 |
| 19 | 81 | 1 | 3 | 4 | 5 | 6 | 13 | 19 | 25 | 32 | 38 | 44 | 51 | 57 |
| 18 | 82 | 1 | 3 | 4 | 5 | 7 | 13 | 20 | 26 | 33 | 39 | 46 | 52 | 59 |
| 17 | 83 | 1 | 3 | 4 | 5 | 7 | 13 | 20 | 27 | 34 | 40 | 47 | 54 | 61 |
| 16 | 84 | 1 | 3 | 4 | 6 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 55 | 62 |
| 15 | 85 | 1 | 3 | 4 | 6 | 7 | 14 | 21 | 29 | 36 | 43 | 50 | 57 | 64 |
| 14 | 86 | 1 | 3 | 4 | 6 | 7 | 15 | 22 | 29 | 37 | 44 | 51 | 59 | 66 |
| 13 | 87 | 2 | 3 | 5 | 6 | 8 | 15 | 23 | 30 | 38 | 45 | 53 | 60 | 68 |
| 12 | 88 | 2 | 3 | 5 | 6 | 8 | 15 | 23 | 31 | 39 | 46 | 54 | 62 | 70 |
| 11 | 89 | 2 | 3 | 5 | 6 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 |
| 10 | 90 | 2 | 3 | 5 | 7 | 8 | 16 | 24 | 33 | 41 | 49 | 57 | 65 | 73 |
| 9 | 91 | 2 | 3 | 5 | 7 | 8 | 17 | 25 | 33 | 42 | 50 | 59 | 67 | 75 |
| 8 | 92 | 2 | 3 | 5 | 7 | 9 | 17 | 26 | 34 | 43 | 51 | 60 | 69 | 77 |
| 7 | 93 | 2 | 4 | 5 | 7 | 9 | 18 | 26 | 35 | 44 | 53 | 61 | 70 | 79 |
| 6 | 94 | 2 | 4 | 5 | 7 | 9 | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 |
| 5 | 95 | 2 | 4 | 6 | 7 | 9 | 18 | 28 | 37 | 46 | 55 | 64 | 73 | 83 |
| 4 | 96 | 2 | 4 | 6 | 8 | 9 | 19 | 28 | 38 | 47 | 56 | 66 | 75 | 84 |
| 3 | 97 | 2 | 4 | 6 | 8 | 10 | 19 | 29 | 38 | 48 | 57 | 67 | 77 | 86 |
| 2 | 98 | 2 | 4 | 6 | 8 | 10 | 20 | 29 | 39 | 49 | 59 | 69 | 78 | 88 |
| 1 | 99 | 2 | 4 | 6 | 8 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| 0 | 100 | 2 | 4 | 6 | 8 | 10 | 20 | 31 | 41 | 51 | 61 | 71 | 82 | 92 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## ENGLISH MEASURES.

**Term for Temperature:** $0.002039\ (\theta - 50^\circ)\ z$.

For temperatures $\left\{\begin{array}{l}\text{above } 50^\circ \text{ F.}\\ \text{below } 50^\circ \text{ F.}\end{array}\right\}$ the values are to be $\left\{\begin{array}{l}\text{added.}\\ \text{subtracted.}\end{array}\right.$

| Mean Temperature. $\theta$. | | APPROXIMATE DIFFERENCE OF HEIGHT OBTAINED FROM TABLE 51. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 20000 |
| F. | F. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| **49°** | **51°** | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 41 |
| 48 | 52 | 4 | 8 | 12 | 16 | 20 | 24 | 29 | 33 | 37 | 41 | 82 |
| 47 | 53 | 6 | 12 | 18 | 24 | 31 | 37 | 43 | 49 | 55 | 61 | 122 |
| 46 | 54 | 8 | 16 | 24 | 33 | 41 | 49 | 57 | 65 | 73 | 82 | 163 |
| **45** | **55** | 10 | 20 | 31 | 41 | 51 | 61 | 71 | 82 | 92 | 102 | 204 |
| 44 | 56 | 12 | 24 | 37 | 49 | 61 | 73 | 86 | 98 | 110 | 122 | 245 |
| 43 | 57 | 14 | 29 | 43 | 57 | 71 | 86 | 100 | 114 | 128 | 143 | 285 |
| 42 | 58 | 16 | 33 | 49 | 65 | 82 | 98 | 114 | 130 | 147 | 163 | 326 |
| 41 | 59 | 18 | 37 | 55 | 73 | 92 | 110 | 128 | 147 | 165 | 184 | 367 |
| **40** | **60** | 20 | 41 | 61 | 82 | 102 | 122 | 143 | 163 | 184 | 204 | 408 |
| 39 | 61 | 22 | 45 | 67 | 90 | 112 | 135 | 157 | 179 | 202 | 224 | 449 |
| 38 | 62 | 24 | 49 | 73 | 98 | 122 | 147 | 171 | 196 | 220 | 245 | 489 |
| 37 | 63 | 27 | 53 | 80 | 106 | 133 | 159 | 186 | 212 | 239 | 265 | 530 |
| 36 | 64 | 29 | 57 | 86 | 114 | 143 | 171 | 200 | 228 | 257 | 285 | 571 |
| **35** | **65** | 31 | 61 | 92 | 122 | 153 | 184 | 214 | 245 | 275 | 306 | 612 |
| 34 | 66 | 33 | 65 | 98 | 130 | 163 | 196 | 228 | 261 | 294 | 326 | 652 |
| 33 | 67 | 35 | 69 | 104 | 139 | 173 | 208 | 243 | 277 | 312 | 347 | 693 |
| 32 | 68 | 37 | 73 | 110 | 147 | 184 | 220 | 257 | 294 | 330 | 367 | 734 |
| 31 | 69 | 39 | 77 | 116 | 155 | 194 | 232 | 271 | 310 | 349 | 387 | 775 |
| **30** | **70** | 41 | 82 | 122 | 163 | 204 | 245 | 285 | 326 | 367 | 408 | 816 |
| 29 | 71 | 43 | 86 | 128 | 171 | 214 | 257 | 300 | 343 | 385 | 428 | 856 |
| 28 | 72 | 45 | 90 | 135 | 179 | 224 | 269 | 314 | 359 | 404 | 449 | 897 |
| 27 | 73 | 47 | 94 | 141 | 188 | 234 | 281 | 328 | 375 | 422 | 469 | 938 |
| 26 | 74 | 49 | 98 | 147 | 196 | 245 | 294 | 343 | 391 | 440 | 489 | 979 |
| **25** | **75** | 51 | 102 | 153 | 204 | 255 | 306 | 357 | 408 | 459 | 510 | 1020 |
| 24 | 76 | 53 | 106 | 159 | 212 | 265 | 318 | 371 | 424 | 477 | 530 | 1060 |
| 23 | 77 | 55 | 110 | 165 | 220 | 275 | 330 | 385 | 440 | 495 | 551 | 1101 |
| 22 | 78 | 57 | 114 | 171 | 228 | 285 | 343 | 400 | 457 | 514 | 571 | 1142 |
| 21 | 79 | 59 | 118 | 177 | 236 | 296 | 355 | 414 | 473 | 532 | 591 | 1183 |
| **20** | **80** | 61 | 122 | 184 | 245 | 306 | 367 | 428 | 489 | 551 | 612 | 1223 |
| 19 | 81 | 63 | 126 | 190 | 253 | 316 | 379 | 442 | 506 | 569 | 632 | 1264 |
| 18 | 82 | 65 | 130 | 196 | 261 | 326 | 391 | 457 | 522 | 587 | 652 | 1305 |
| 17 | 83 | 67 | 135 | 202 | 269 | 336 | 404 | 471 | 538 | 606 | 673 | 1346 |
| 16 | 84 | 69 | 139 | 208 | 277 | 347 | 416 | 485 | 555 | 624 | 693 | 1387 |
| **15** | **85** | 71 | 143 | 214 | 285 | 357 | 428 | 500 | 571 | 642 | 714 | 1427 |
| 14 | 86 | 73 | 147 | 220 | 294 | 367 | 440 | 514 | 587 | 661 | 734 | 1468 |
| 13 | 87 | 75 | 151 | 226 | 302 | 377 | 453 | 528 | 604 | 679 | 754 | 1509 |
| 12 | 88 | 77 | 155 | 232 | 310 | 387 | 465 | 542 | 620 | 697 | 775 | 1550 |
| 11 | 89 | 80 | 159 | 239 | 318 | 398 | 477 | 557 | 636 | 716 | 795 | 1590 |
| **10** | **90** | 82 | 163 | 245 | 326 | 408 | 489 | 571 | 652 | 734 | 816 | 1631 |
| 9 | 91 | 84 | 167 | 251 | 334 | 418 | 502 | 585 | 669 | 752 | 836 | 1672 |
| 8 | 92 | 86 | 171 | 257 | 343 | 428 | 514 | 599 | 685 | 771 | 856 | 1713 |
| 7 | 93 | 88 | 175 | 263 | 351 | 438 | 526 | 614 | 701 | 789 | 877 | 1754 |
| 6 | 94 | 90 | 179 | 269 | 359 | 449 | 538 | 628 | 718 | 807 | 897 | 1794 |
| **5** | **95** | 92 | 184 | 275 | 367 | 459 | 551 | 642 | 734 | 826 | 918 | 1835 |
| 4 | 96 | 94 | 188 | 281 | 375 | 469 | 563 | 657 | 750 | 844 | 938 | 1876 |
| 3 | 97 | 96 | 192 | 287 | 383 | 479 | 575 | 671 | 767 | 862 | 958 | 1917 |
| 2 | 98 | 98 | 196 | 294 | 391 | 489 | 587 | 685 | 783 | 881 | 979 | 1957 |
| 1 | 99 | 100 | 200 | 300 | 400 | 500 | 599 | 699 | 799 | 899 | 999 | 1998 |
| **0** | **100** | 102 | 204 | 306 | 408 | 510 | 612 | 714 | 816 | 918 | 1020 | 2039 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## ENGLISH MEASURES.

Correction for Gravity and Weight of Mercury: $z(0.002640 \cos 2\phi - 0.000007 \cos^2 2\phi + 0.00244)$.

| Latitude. $\phi$ | APPROXIMATE DIFFERENCE OF HEIGHT OBTAINED FROM TABLES 51-52. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 1500 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 | 5000 | 5500 |
| | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 0° | +3 | +5 | +8 | +10 | +13 | +15 | +18 | +20 | +23 | +25 | +28 |
| 2 | 3 | 5 | 8 | 10 | 13 | 15 | 18 | 20 | 23 | 25 | 28 |
| 4 | 3 | 5 | 8 | 10 | 13 | 15 | 18 | 20 | 23 | 25 | 28 |
| 6 | 3 | 5 | 8 | 10 | 13 | 15 | 18 | 20 | 23 | 25 | 28 |
| 8 | 2 | 5 | 7 | 10 | 12 | 15 | 17 | 20 | 22 | 25 | 27 |
| 10 | +2 | +5 | +7 | +10 | +12 | +15 | +17 | +20 | +22 | +25 | +27 |
| 12 | 2 | 5 | 7 | 10 | 12 | 15 | 17 | 19 | 22 | 24 | 27 |
| 14 | 2 | 5 | 7 | 10 | 12 | 14 | 17 | 19 | 21 | 24 | 26 |
| 16 | 2 | 5 | 7 | 9 | 12 | 14 | 16 | 19 | 21 | 23 | 26 |
| 18 | 2 | 5 | 7 | 9 | 11 | 14 | 16 | 18 | 21 | 23 | 25 |
| 20 | +2 | +4 | +7 | + 9 | +11 | +13 | +16 | +18 | +20 | +22 | +24 |
| 22 | 2 | 4 | 6 | 9 | 11 | 13 | 15 | 17 | 19 | 22 | 24 |
| 24 | 2 | 4 | 6 | 8 | 10 | 13 | 15 | 17 | 19 | 21 | 23 |
| 26 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 |
| 28 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 21 |
| 30 | +2 | +4 | +6 | + 8 | + 9 | +11 | +13 | +15 | +17 | +19 | +21 |
| 32 | 2 | 4 | 5 | 7 | 9 | 11 | 13 | 14 | 16 | 18 | 20 |
| 34 | 2 | 3 | 5 | 7 | 9 | 10 | 12 | 14 | 15 | 17 | 19 |
| 36 | 2 | 3 | 5 | 6 | 8 | 10 | 11 | 13 | 15 | 16 | 18 |
| 38 | 2 | 3 | 5 | 6 | 8 | 9 | 11 | 12 | 14 | 15 | 17 |
| 40 | +1 | +3 | +4 | + 6 | + 7 | + 9 | +10 | +12 | +13 | +14 | +16 |
| 42 | 1 | 3 | 4 | 5 | 7 | 8 | 9 | 11 | 12 | 13 | 15 |
| 44 | 1 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 13 | 14 |
| 45 | +1 | +2 | +4 | + 5 | + 6 | + 7 | + 9 | +10 | +11 | +12 | +13 |
| 46 | +1 | +2 | +4 | + 5 | + 6 | + 7 | + 8 | + 9 | +11 | +12 | +13 |
| 48 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 12 |
| 50 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 52 | +1 | +2 | +3 | + 4 | + 4 | + 5 | + 6 | + 7 | + 8 | + 9 | +10 |
| 54 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 9 |
| 56 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 7 | 8 |
| 58 | 1 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 | 7 |
| 60 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 6 |
| 62 | 0 | +1 | +1 | + 2 | + 2 | + 3 | + 3 | + 4 | + 4 | + 5 | + 5 |
| 64 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 3 | 4 | 4 |
| 66 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| 68 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 |
| 70 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 |
| 72 | 0 | 0 | 0 | 0 | + 1 | + 1 | + 1 | + 1 | + 1 | + 1 | + 1 |
| 74 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 76 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 78 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 80 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## ENGLISH MEASURES.

Correction for Gravity and Weight of Mercury : $z\,(0.002640\ \cos 2\phi - 0.000007\ \cos^2 2\phi + 0.00244)$.

| Latitude. $\phi$ | APPROXIMATE DIFFERENCE OF HEIGHT OBTAINED FROM TABLES 51-52. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6000 | 7000 | 8000 | 9000 | 10000 | 11000 | 12000 | 13000 | 14000 | 15000 | 20000 |
| | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 0° | +30 | +35 | +41 | +46 | +51 | +56 | +61 | +66 | +71 | +76 | +101 |
| 2 | 30 | 35 | 40 | 46 | 51 | 56 | 61 | 66 | 71 | 76 | 101 |
| 4 | 30 | 35 | 40 | 45 | 50 | 55 | 61 | 66 | 71 | 76 | 101 |
| 6 | 30 | 35 | 40 | 45 | 50 | 55 | 61 | 66 | 71 | 76 | 100 |
| 8 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 | 70 | 75 | 99 |
| 10 | +29 | +34 | +39 | +44 | +49 | +54 | +59 | +64 | +69 | +74 | + 98 |
| 12 | 29 | 34 | 39 | 44 | 48 | 53 | 58 | 63 | 68 | 73 | 97 |
| 14 | 29 | 33 | 38 | 43 | 48 | 52 | 57 | 62 | 67 | 71 | 95 |
| 16 | 28 | 33 | 37 | 42 | 47 | 51 | 56 | 61 | 65 | 70 | 93 |
| 18 | 27 | 32 | 37 | 41 | 46 | 50 | 55 | 59 | 64 | 68 | 91 |
| 20 | +27 | +31 | +36 | +40 | +45 | +49 | +53 | +58 | +62 | +67 | + 89 |
| 22 | 26 | 30 | 35 | 39 | 43 | 48 | 52 | 56 | 61 | 65 | 87 |
| 24 | 25 | 29 | 34 | 38 | 42 | 46 | 50 | 55 | 59 | 63 | 84 |
| 26 | 24 | 28 | 32 | 37 | 41 | 45 | 49 | 53 | 57 | 61 | 81 |
| 28 | 23 | 27 | 31 | 35 | 39 | 43 | 47 | 51 | 55 | 59 | 78 |
| 30 | +23 | +26 | +30 | +34 | +38 | +41 | +45 | +49 | +53 | +56 | + 75 |
| 32 | 22 | 25 | 29 | 32 | 36 | 40 | 43 | 47 | 50 | 54 | 72 |
| 34 | 21 | 24 | 27 | 31 | 34 | 38 | 41 | 44 | 48 | 51 | 68 |
| 36 | 20 | 23 | 26 | 29 | 32 | 36 | 39 | 42 | 46 | 49 | 65 |
| 38 | 18 | 22 | 25 | 28 | 31 | 34 | 37 | 40 | 43 | 46 | 61 |
| 40 | +17 | +20 | +23 | +26 | +29 | +32 | +35 | +38 | +41 | +43 | + 57 |
| 42 | 16 | 19 | 22 | 24 | 27 | 30 | 33 | 35 | 38 | 41 | 54 |
| 44 | 15 | 18 | 20 | 23 | 25 | 28 | 30 | 33 | 35 | 38 | 50 |
| 45 | +15 | +17 | +19 | +22 | +24 | +27 | +29 | +32 | +34 | +37 | + 49 |
| 46 | +14 | +16 | +19 | +21 | +23 | +26 | +28 | +30 | +33 | +35 | + 46 |
| 48 | 13 | 15 | 17 | 19 | 22 | 24 | 26 | 28 | 30 | 32 | 43 |
| 50 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 40 |
| 52 | +11 | +13 | +14 | +16 | +18 | +20 | +22 | +23 | +25 | +27 | + 36 |
| 54 | 10 | 11 | 13 | 15 | 16 | 18 | 19 | 21 | 23 | 24 | 32 |
| 56 | 9 | 10 | 12 | 13 | 14 | 16 | 17 | 19 | 20 | 22 | 29 |
| 58 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 17 | 18 | 19 | 26 |
| 60 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 17 | 22 |
| 62 | + 6 | + 7 | + 8 | + 9 | +10 | +11 | +11 | +12 | +13 | +14 | + 19 |
| 64 | 5 | 6 | 6 | 7 | 8 | 9 | 10 | 10 | 11 | 12 | 16 |
| 66 | 4 | 5 | 5 | 6 | 7 | 7 | 8 | 9 | 9 | 10 | 13 |
| 68 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 11 |
| 70 | 2 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 8 |
| 72 | + 2 | + 2 | + 2 | + 3 | + 3 | | | | | | |
| 74 | + 1 | + 1 | + 2 | + 2 | + 2 | | | | | | |
| 76 | + 1 | + 1 | + 1 | + 1 | + 1 | | | | | | |
| 78 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| 80 | 0 | 0 | 0 | 0 | − 1 | | | | | | |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## ENGLISH MEASURES.

### Correction for an Average Degree of Humidity.

| Mean Temperature. | Approximate difference of height obtained from Tables 51-52 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 20000 |
| F. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| −20° | 0 | 0 | 0 | 0 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | +2 |
| −16 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | 1 | 2 | 2 | 2 | 4 |
| −12 | 0 | 0 | +1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 6 |
| −8 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 9 |
| −6 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 10 |
| −4 | 0 | +1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 6 | 11 |
| −2 | 0 | 1 | 1 | 2 | 2 | 3 | 4 | 4 | 5 | 6 | 6 | 12 |
| 0 | 0 | 1 | 1 | 2 | 3 | 3 | 4 | 5 | 5 | 6 | 7 | 14 |
| +2 | 0 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 7 | 15 |
| 4 | 0 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 7 | 7 | 8 | 16 |
| 6 | 0 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 8 | 9 | 18 |
| 8 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 19 |
| 10 | +1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 21 |
| 12 | 1 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 22 |
| 14 | 1 | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 11 | 12 | 24 |
| 16 | 1 | 1 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 11 | 13 | 25 |
| 18 | 1 | 1 | 3 | 4 | 5 | 7 | 8 | 9 | 11 | 12 | 13 | 27 |
| 20 | 1 | 1 | 3 | 4 | 6 | 7 | 9 | 10 | 11 | 13 | 14 | 29 |
| 22 | 1 | 2 | 3 | 5 | 6 | 8 | 9 | 11 | 12 | 14 | 15 | 31 |
| 24 | 1 | 2 | 3 | 5 | 7 | 8 | 10 | 11 | 13 | 15 | 16 | 33 |
| 26 | 1 | 2 | 3 | 5 | 7 | 9 | 10 | 12 | 14 | 16 | 17 | 35 |
| 28 | 1 | 2 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 37 |
| 30 | 1 | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 41 |
| 32 | 1 | 2 | 4 | 7 | 9 | 11 | 13 | 16 | 18 | 20 | 22 | 44 |
| 34 | 1 | 2 | 5 | 7 | 10 | 12 | 15 | 17 | 19 | 22 | 24 | 49 |
| 36 | 1 | 3 | 5 | 8 | 11 | 13 | 16 | 19 | 21 | 24 | 27 | 53 |
| 38 | 1 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 23 | 26 | 29 | 59 |
| 40 | 2 | 3 | 6 | 10 | 13 | 16 | 19 | 23 | 26 | 29 | 32 | 64 |
| 42 | 2 | 4 | 7 | 11 | 14 | 18 | 21 | 25 | 28 | 32 | 35 | 71 |
| 44 | 2 | 4 | 8 | 12 | 15 | 19 | 23 | 27 | 31 | 35 | 39 | 77 |
| 46 | 2 | 4 | 8 | 13 | 17 | 21 | 25 | 29 | 34 | 38 | 42 | 84 |
| 48 | 2 | 5 | 9 | 14 | 18 | 23 | 27 | 32 | 37 | 41 | 46 | 92 |
| 50 | 2 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 99 |
| 52 | 3 | 5 | 11 | 16 | 21 | 27 | 32 | 37 | 43 | 48 | 53 | 107 |
| 54 | 3 | 6 | 11 | 17 | 23 | 29 | 34 | 40 | 46 | 51 | 57 | 114 |
| 56 | 3 | 6 | 12 | 18 | 24 | 30 | 37 | 43 | 49 | 55 | 61 | 122 |
| 58 | 3 | 6 | 13 | 19 | 26 | 32 | 39 | 45 | 52 | 58 | 65 | 130 |
| 60 | 3 | 7 | 14 | 21 | 27 | 34 | 41 | 48 | 55 | 62 | 69 | 137 |
| 62 | 4 | 7 | 14 | 22 | 29 | 36 | 43 | 51 | 58 | 65 | 72 | 145 |
| 64 | 4 | 8 | 15 | 23 | 30 | 38 | 46 | 53 | 61 | 69 | 76 | 152 |
| 66 | 4 | 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | 72 | 80 | 160 |
| 68 | 4 | 8 | 17 | 25 | 34 | 42 | 50 | 59 | 67 | 76 | 84 | 168 |
| 70 | 4 | 9 | 18 | 26 | 35 | 44 | 53 | 61 | 70 | 79 | 88 | 175 |
| 72 | 5 | 9 | 18 | 27 | 37 | 46 | 55 | 64 | 73 | 82 | 91 | 183 |
| 76 | 5 | 10 | 20 | 30 | 40 | 49 | 59 | 69 | 79 | 89 | 99 | 198 |
| 80 | 5 | 11 | 21 | 32 | 43 | 53 | 64 | 75 | 85 | 96 | 106 | 213 |
| 84 | 6 | 11 | 23 | 34 | 46 | 57 | 68 | 80 | 91 | 103 | 114 | 228 |
| 88 | 6 | 12 | 24 | 37 | 49 | 61 | 73 | 85 | 97 | 110 | 122 | 243 |
| 92 | 6 | 13 | 26 | 39 | 52 | 65 | 78 | 91 | 103 | 116 | 129 | 259 |
| 96 | 7 | 14 | 27 | 41 | 55 | 68 | 82 | 96 | 110 | 123 | 137 | 274 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## ENGLISH MEASURES.

Correction for the Variation of Gravity with Altitude: $\frac{z(z+2h_0)}{R}$.

| Approximate difference of height. Z. | HEIGHT OF LOWER STATION IN FEET ($h_0$). | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 | 8000 | 9000 | 10000 | 12000 |
| Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | +1 |
| 1000 | 0 | 0 | 0 | 0 | 0 | +1 | +1 | +1 | +1 | +1 | +1 | 1 |
| 1500 | 0 | 0 | 0 | +1 | +1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| 2000 | 0 | 0 | +1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| 2500 | 0 | +1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 |
| 3000 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 |
| 3500 | +1 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 |
| 4000 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 5 | 5 |
| 4500 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 6 |
| 5000 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 |
| 5500 | 1 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 8 |
| 6000 | 2 | 2 | 3 | 3 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 9 |
| 6500 | 2 | 3 | 3 | 4 | 5 | 5 | 6 | 6 | 7 | 8 | 8 | 9 |
| 7000 | 2 | 3 | 4 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 10 |
| 7500 | 3 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 8 | 9 | 10 | 11 |
| 8000 | 3 | 4 | 5 | 5 | 6 | 7 | 8 | 8 | 9 | 10 | 11 | 12 |
| 8500 | 3 | 4 | 5 | 6 | 7 | 8 | 8 | 9 | 10 | 11 | 12 | 13 |
| 9000 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 12 | 14 |
| 9500 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 13 | 15 |
| 10000 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 11 | 12 | 13 | 14 | 16 |
| 11000 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 18 |
| 12000 | 7 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 16 | 17 | 18 | 21 |
| 13000 | 8 | 9 | 11 | 12 | 13 | 14 | 16 | 17 | 18 | 19 | 21 | 23 |
| 14000 | 9 | 11 | 12 | 13 | 15 | 16 | 17 | 19 | 20 | 21 | 23 | 25 |
| 15000 | 11 | 12 | 14 | 15 | 17 | 18 | 19 | 21 | 22 | 24 | 25 | 28 |
| 16000 | 12 | 14 | 15 | 17 | 18 | 20 | 21 | 23 | 25 | 26 | 28 | 31 |
| 17000 | 14 | 15 | 17 | 19 | 20 | 22 | 24 | 25 | 27 | 28 | 30 | |
| 18000 | 16 | 17 | 19 | 21 | 22 | 24 | 26 | 28 | 30 | 31 | | |
| 19000 | 17 | 19 | 21 | 23 | 25 | 26 | 28 | 30 | 32 | | | |
| 20000 | 19 | 21 | 23 | 25 | 27 | 29 | 31 | | | | | |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## METRIC MEASURES.

### Values of 18400 log $\frac{760}{B}$.

| Barometric Pressure. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| mm. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| **300** | 7428 | 7401 | 7375 | 7348 | 7322 | 7296 | 7270 | 7244 | 7218 | 7192 |
| 310 | 7166 | 7140 | 7115 | 7089 | 7064 | 7038 | 7013 | 6987 | 6962 | 6937 |
| 320 | 6912 | 6887 | 6862 | 6838 | 6813 | 6789 | 6764 | 6740 | 6715 | 6691 |
| 330 | 6666 | 6642 | 6618 | 6594 | 6570 | 6546 | 6522 | 6498 | 6475 | 6451 |
| 340 | 6428 | 6405 | 6381 | 6358 | 6334 | 6311 | 6288 | 6265 | 6242 | 6219 |
| **350** | 6196 | 6173 | 6151 | 6128 | 6106 | 6083 | 6061 | 6038 | 6016 | 5993 |
| 360 | 5971 | 5949 | 5927 | 5905 | 5883 | 5861 | 5839 | 5817 | 5795 | 5773 |
| 370 | 5752 | 5730 | 5709 | 5687 | 5666 | 5644 | 5623 | 5602 | 5581 | 5560 |
| 380 | 5539 | 5518 | 5497 | 5476 | 5455 | 5434 | 5414 | 5393 | 5373 | 5352 |
| 390 | 5332 | 5311 | 5291 | 5270 | 5250 | 5229 | 5209 | 5189 | 5169 | 5149 |
| **400** | 5129 | 5109 | 5089 | 5069 | 5049 | 5029 | 5010 | 4990 | 4971 | 4951 |
| 410 | 4932 | 4912 | 4893 | 4873 | 4854 | 4834 | 4815 | 4796 | 4777 | 4758 |
| 420 | 4739 | 4720 | 4701 | 4682 | 4663 | 4644 | 4625 | 4606 | 4588 | 4569 |
| 430 | 4551 | 4532 | 4514 | 4495 | 4477 | 4458 | 4440 | 4422 | 4404 | 4386 |
| 440 | 4368 | 4350 | 4332 | 4314 | 4296 | 4278 | 4260 | 4242 | 4224 | 4206 |
| **450** | 4188 | 4170 | 4152 | 4134 | 4117 | 4099 | 4082 | 4064 | 4047 | 4029 |
| 460 | 4012 | 3994 | 3977 | 3959 | 3942 | 3925 | 3908 | 3891 | 3874 | 3857 |
| 470 | 3840 | 3823 | 3806 | 3789 | 3772 | 3755 | 3738 | 3721 | 3705 | 3688 |
| 480 | 3672 | 3655 | 3639 | 3622 | 3606 | 3589 | 3573 | 3556 | 3540 | 3523 |
| 490 | 3507 | 3490 | 3474 | 3458 | 3442 | 3426 | 3410 | 3394 | 3378 | 3362 |
| **500** | 3346 | 3330 | 3314 | 3298 | 3282 | 3266 | 3250 | 3235 | 3219 | 3203 |
| 510 | 3188 | 3172 | 3157 | 3141 | 3126 | 3110 | 3095 | 3079 | 3064 | 3048 |
| 520 | 3033 | 3017 | 3002 | 2986 | 2971 | 2955 | 2940 | 2925 | 2910 | 2895 |
| 530 | 2880 | 2865 | 2850 | 2835 | 2820 | 2805 | 2790 | 2775 | 2760 | 2745 |
| 540 | 2731 | 2716 | 2701 | 2687 | 2672 | 2657 | 2643 | 2628 | 2613 | 2599 |
| **550** | 2584 | 2570 | 2555 | 2541 | 2526 | 2512 | 2497 | 2483 | 2468 | 2454 |
| 560 | 2440 | 2426 | 2411 | 2397 | 2383 | 2369 | 2355 | 2341 | 2327 | 2313 |
| 570 | 2299 | 2285 | 2271 | 2257 | 2243 | 2229 | 2215 | 2201 | 2188 | 2174 |
| 580 | 2160 | 2146 | 2133 | 2119 | 2105 | 2092 | 2078 | 2064 | 2051 | 2037 |
| 590 | 2023 | 2010 | 1996 | 1983 | 1969 | 1956 | 1942 | 1929 | 1915 | 1902 |
| **600** | 1889 | 1875 | 1862 | 1848 | 1835 | 1822 | 1809 | 1796 | 1783 | 1770 |
| 610 | 1757 | 1744 | 1731 | 1718 | 1705 | 1692 | 1679 | 1666 | 1653 | 1640 |
| 620 | 1627 | 1614 | 1601 | 1588 | 1576 | 1563 | 1550 | 1537 | 1525 | 1512 |
| 630 | 1499 | 1486 | 1474 | 1461 | 1448 | 1436 | 1423 | 1411 | 1398 | 1386 |
| 640 | 1373 | 1361 | 1348 | 1336 | 1323 | 1311 | 1298 | 1286 | 1273 | 1261 |
| **650** | 1249 | 1236 | 1224 | 1212 | 1199 | 1187 | 1175 | 1163 | 1151 | 1139 |
| 660 | 1127 | 1115 | 1103 | 1091 | 1079 | 1067 | 1055 | 1043 | 1031 | 1019 |
| 670 | 1007 | 995 | 983 | 971 | 960 | 948 | 936 | 924 | 913 | 901 |
| 680 | 889 | 877 | 866 | 854 | 842 | 831 | 819 | 807 | 796 | 784 |
| 690 | 772 | 761 | 749 | 738 | 726 | 715 | 703 | 692 | 680 | 669 |
| **700** | 657 | 646 | 635 | 623 | 612 | 601 | 589 | 578 | 567 | 555 |
| 710 | 544 | 533 | 521 | 510 | 499 | 487 | 476 | 465 | 454 | 443 |
| 720 | 432 | 421 | 410 | 399 | 388 | 377 | 366 | 355 | 344 | 333 |
| 730 | 322 | 311 | 300 | 289 | 278 | 267 | 256 | 245 | 234 | 224 |
| 740 | 213 | 202 | 192 | 181 | 170 | 160 | 149 | 138 | 128 | 117 |
| **750** | + 106 | + 95 | + 85 | + 74 | + 64 | + 53 | + 43 | + 32 | + 22 | + 11 |
| 760 | 0 | − 10 | − 21 | − 31 | − 42 | − 52 | − 63 | − 73 | − 83 | − 94 |
| 770 | − 104 | − 115 | − 125 | − 136 | − 146 | − 156 | − 166 | − 177 | − 187 | − 197 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## DYNAMIC MEASURES.

Values of $18400 \log \frac{1013.3}{B}$

| Barometric Pressure | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| mb. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| 0 | ∞ | 55306 | 49767 | 46527 | 44228 | 42445 | 40988 | 39756 | 38689 | 37748 |
| 10 | 36906 | 36144 | 35448 | 34809 | 34217 | 33666 | 33150 | 32665 | 32209 | 31777 |
| 20 | 31367 | 30977 | 30605 | 30250 | 29910 | 29584 | 29270 | 28969 | 28678 | 28397 |
| 30 | 28127 | 27865 | 27611 | 27365 | 27126 | 26895 | 26670 | 26451 | 26238 | 26031 |
| 40 | 25828 | 25630 | 25438 | 25250 | 25066 | 24887 | 24711 | 24539 | 24371 | 24206 |
| 50 | 24043 | 23886 | 23731 | 23579 | 23430 | 23283 | 23139 | 22998 | 22859 | 22722 |
| 60 | 22588 | 22456 | 22326 | 22198 | 22072 | 21948 | 21827 | 21706 | 21587 | 21471 |
| 70 | 21356 | 21242 | 21131 | 21021 | 20912 | 20805 | 20699 | 20594 | 20491 | 20389 |
| 80 | 20289 | 20189 | 20092 | 19995 | 19899 | 19804 | 19711 | 19618 | 19527 | 19437 |
| 90 | 19348 | 19259 | 19172 | 19086 | 19000 | 18916 | 18832 | 18749 | 18667 | 18586 |
| 100 | 18506 | 18426 | 18347 | 18269 | 18192 | 18116 | 18040 | 17965 | 17891 | 17817 |
| 110 | 17744 | 17672 | 17600 | 17529 | 17459 | 17389 | 17320 | 17251 | 17183 | 17115 |
| 120 | 17049 | 16982 | 16917 | 16851 | 16787 | 16722 | 16659 | 16596 | 16533 | 16471 |
| 130 | 16409 | 16348 | 16287 | 16227 | 16167 | 16108 | 16048 | 15990 | 15932 | 15874 |
| 140 | 15817 | 15760 | 15703 | 15647 | 15592 | 15536 | 15482 | 15427 | 15373 | 15319 |
| 150 | 15266 | 15212 | 15160 | 15107 | 15055 | 15004 | 14952 | 14901 | 14850 | 14800 |
| 160 | 14750 | 14700 | 14650 | 14601 | 14553 | 14504 | 14456 | 14408 | 14360 | 14312 |
| 170 | 14265 | 14218 | 14172 | 14125 | 14079 | 14034 | 13988 | 13943 | 13898 | 13853 |
| 180 | 13809 | 13764 | 13720 | 13677 | 13633 | 13590 | 13547 | 13504 | 13461 | 13419 |
| 190 | 13377 | 13335 | 13293 | 13251 | 13210 | 13169 | 13128 | 13087 | 13047 | 13007 |
| 200 | 12967 | 12927 | 12887 | 12848 | 12808 | 12769 | 12730 | 12692 | 12653 | 12615 |
| 210 | 12577 | 12539 | 12501 | 12463 | 12426 | 12389 | 12352 | 12315 | 12278 | 12242 |
| 220 | 12205 | 12169 | 12133 | 12097 | 12061 | 12026 | 11990 | 11955 | 11920 | 11885 |
| 230 | 11850 | 11815 | 11781 | 11746 | 11712 | 11678 | 11644 | 11610 | 11577 | 11543 |
| 240 | 11510 | 11476 | 11443 | 11410 | 11378 | 11345 | 11312 | 11280 | 11248 | 11216 |
| 250 | 11184 | 11152 | 11120 | 11088 | 11057 | 11025 | 10994 | 10963 | 10932 | 10901 |
| 260 | 10870 | 10839 | 10809 | 10778 | 10748 | 10718 | 10688 | 10658 | 10628 | 10598 |
| 270 | 10569 | 10539 | 10510 | 10480 | 10451 | 10422 | 10393 | 10364 | 10335 | 10307 |
| 280 | 10278 | 10249 | 10221 | 10193 | 10165 | 10137 | 10108 | 10081 | 10053 | 10025 |
| 290 | 9997 | 9970 | 9943 | 9915 | 9888 | 9861 | 9834 | 9807 | 9780 | 9753 |
| 300 | 9727 | 9700 | 9674 | 9647 | 9621 | 9594 | 9568 | 9542 | 9516 | 9490 |
| 310 | 9465 | 9439 | 9413 | 9388 | 9362 | 9337 | 9311 | 9286 | 9261 | 9236 |
| 320 | 9211 | 9186 | 9161 | 9136 | 9111 | 9087 | 9062 | 9038 | 9014 | 8989 |
| 330 | 8965 | 8941 | 8917 | 8893 | 8869 | 8845 | 8821 | 8797 | 8773 | 8750 |
| 340 | 8726 | 8703 | 8679 | 8656 | 8633 | 8610 | 8587 | 8564 | 8541 | 8518 |
| 350 | 8495 | 8472 | 8449 | 8427 | 8404 | 8381 | 8359 | 8336 | 8314 | 8292 |
| 360 | 8270 | 8247 | 8225 | 8203 | 8181 | 8159 | 8138 | 8116 | 8094 | 8073 |
| 370 | 8051 | 8029 | 8008 | 7986 | 7965 | 7943 | 7922 | 7901 | 7880 | 7859 |
| 380 | 7838 | 7817 | 7796 | 7775 | 7754 | 7733 | 7712 | 7692 | 7671 | 7651 |
| 390 | 7630 | 7610 | 7589 | 7569 | 7548 | 7528 | 7508 | 7488 | 7468 | 7448 |
| 400 | 7428 | 7408 | 7388 | 7368 | 7348 | 7328 | 7309 | 7289 | 7269 | 7250 |
| 410 | 7230 | 7211 | 7191 | 7172 | 7153 | 7133 | 7114 | 7095 | 7076 | 7057 |
| 420 | 7038 | 7019 | 7000 | 6981 | 6962 | 6943 | 6924 | 6906 | 6887 | 6868 |
| 430 | 6850 | 6831 | 6813 | 6794 | 6776 | 6757 | 6739 | 6721 | 6703 | 6684 |
| 440 | 6666 | 6648 | 6630 | 6612 | 6594 | 6576 | 6558 | 6540 | 6522 | 6504 |
| 450 | 6487 | 6469 | 6451 | 6433 | 6416 | 6398 | 6381 | 6363 | 6346 | 6328 |
| 460 | 6311 | 6294 | 6276 | 6259 | 6242 | 6225 | 6207 | 6190 | 6173 | 6156 |
| 470 | 6139 | 6122 | 6105 | 6088 | 6071 | 6055 | 6038 | 6021 | 6004 | 5987 |
| 480 | 5971 | 5954 | 5937 | 5921 | 5904 | 5888 | 5871 | 5855 | 5839 | 5822 |
| 490 | 5806 | 5790 | 5773 | 5757 | 5741 | 5725 | 5709 | 5693 | 5677 | 5661 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## DYNAMIC MEASURES.

Values of 18400 log $\frac{1013.3}{B}$

| Barometric Pressure | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| mb. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| 500 | 5645 | 5629 | 5613 | 5597 | 5581 | 5565 | 5549 | 5533 | 5518 | 5502 |
| 510 | 5486 | 5471 | 5455 | 5439 | 5424 | 5408 | 5393 | 5377 | 5362 | 5346 |
| 520 | 5331 | 5316 | 5300 | 5285 | 5270 | 5255 | 5239 | 5224 | 5209 | 5194 |
| 530 | 5179 | 5164 | 5149 | 5134 | 5119 | 5104 | 5089 | 5074 | 5059 | 5044 |
| 540 | 5030 | 5015 | 5000 | 4985 | 4971 | 4956 | 4941 | 4927 | 4912 | 4898 |
| 550 | 4883 | 4868 | 4854 | 4839 | 4825 | 4811 | 4796 | 4782 | 4768 | 4753 |
| 560 | 4739 | 4725 | 4710 | 4696 | 4682 | 4668 | 4654 | 4640 | 4626 | 4612 |
| 570 | 4598 | 4583 | 4569 | 4556 | 4542 | 4528 | 4514 | 4500 | 4486 | 4472 |
| 580 | 4459 | 4445 | 4431 | 4417 | 4404 | 4390 | 4376 | 4363 | 4349 | 4335 |
| 590 | 4322 | 4308 | 4295 | 4281 | 4268 | 4254 | 4241 | 4228 | 4214 | 4201 |
| 600 | 4188 | 4174 | 4161 | 4148 | 4134 | 4121 | 4108 | 4095 | 4082 | 4069 |
| 610 | 4056 | 4042 | 4029 | 4016 | 4003 | 3990 | 3977 | 3964 | 3951 | 3939 |
| 620 | 3926 | 3913 | 3900 | 3887 | 3874 | 3861 | 3849 | 3836 | 3823 | 3810 |
| 630 | 3798 | 3785 | 3772 | 3760 | 3747 | 3735 | 3722 | 3709 | 3697 | 3684 |
| 640 | 3672 | 3659 | 3647 | 3635 | 3622 | 3610 | 3597 | 3585 | 3573 | 3560 |
| 650 | 3548 | 3536 | 3523 | 3511 | 3499 | 3487 | 3475 | 3462 | 3450 | 3438 |
| 660 | 3426 | 3414 | 3402 | 3390 | 3378 | 3366 | 3354 | 3342 | 3330 | 3318 |
| 670 | 3306 | 3294 | 3282 | 3270 | 3258 | 3246 | 3235 | 3223 | 3211 | 3199 |
| 680 | 3187 | 3176 | 3164 | 3152 | 3141 | 3129 | 3117 | 3106 | 3094 | 3082 |
| 690 | 3071 | 3059 | 3048 | 3036 | 3025 | 3013 | 3002 | 2990 | 2979 | 2967 |
| 700 | 2956 | 2944 | 2933 | 2922 | 2910 | 2899 | 2888 | 2876 | 2865 | 2854 |
| 710 | 2842 | 2831 | 2820 | 2809 | 2798 | 2786 | 2775 | 2764 | 2753 | 2742 |
| 720 | 2731 | 2720 | 2708 | 2697 | 2686 | 2675 | 2664 | 2653 | 2642 | 2631 |
| 730 | 2621 | 2609 | 2599 | 2588 | 2577 | 2566 | 2555 | 2544 | 2533 | 2523 |
| 740 | 2512 | 2501 | 2490 | 2479 | 2469 | 2458 | 2447 | 2437 | 2426 | 2415 |
| 750 | 2405 | 2394 | 2383 | 2373 | 2362 | 2351 | 2341 | 2330 | 2320 | 2309 |
| 760 | 2299 | 2288 | 2278 | 2267 | 2257 | 2246 | 2236 | 2225 | 2215 | 2205 |
| 770 | 2194 | 2184 | 2173 | 2163 | 2153 | 2142 | 2132 | 2122 | 2112 | 2101 |
| 780 | 2091 | 2081 | 2071 | 2060 | 2050 | 2040 | 2030 | 2020 | 2009 | 1999 |
| 790 | 1989 | 1979 | 1969 | 1959 | 1949 | 1939 | 1929 | 1919 | 1909 | 1899 |
| 800 | 1889 | 1879 | 1869 | 1859 | 1849 | 1839 | 1829 | 1819 | 1809 | 1799 |
| 810 | 1789 | 1780 | 1770 | 1760 | 1750 | 1740 | 1731 | 1721 | 1711 | 1701 |
| 820 | 1692 | 1682 | 1672 | 1662 | 1653 | 1643 | 1633 | 1623 | 1614 | 1604 |
| 830 | 1595 | 1585 | 1575 | 1566 | 1556 | 1547 | 1537 | 1527 | 1518 | 1508 |
| 840 | 1499 | 1489 | 1480 | 1470 | 1461 | 1451 | 1442 | 1433 | 1423 | 1414 |
| 850 | 1404 | 1395 | 1386 | 1376 | 1367 | 1357 | 1348 | 1339 | 1329 | 1320 |
| 860 | 1311 | 1302 | 1292 | 1283 | 1274 | 1264 | 1255 | 1246 | 1237 | 1228 |
| 870 | 1218 | 1209 | 1200 | 1191 | 1182 | 1173 | 1164 | 1154 | 1145 | 1136 |
| 880 | 1127 | 1118 | 1109 | 1100 | 1091 | 1082 | 1073 | 1064 | 1055 | 1046 |
| 890 | 1037 | 1028 | 1019 | 1010 | 1001 | 992 | 983 | 974 | 965 | 956 |
| 900 | 948 | 939 | 930 | 921 | 912 | 903 | 894 | 886 | 877 | 868 |
| 910 | 859 | 850 | 842 | 833 | 824 | 815 | 807 | 798 | 789 | 781 |
| 920 | 772 | 763 | 755 | 746 | 737 | 729 | 720 | 711 | 703 | 694 |
| 930 | 686 | 677 | 668 | 660 | 651 | 643 | 634 | 626 | 617 | 608 |
| 940 | 600 | 592 | 583 | 575 | 566 | 558 | 549 | 541 | 532 | 524 |
| 950 | 516 | 507 | 499 | 490 | 482 | 474 | 465 | 457 | 448 | 440 |
| 960 | 432 | 424 | 415 | 407 | 399 | 390 | 382 | 374 | 365 | 357 |
| 970 | 349 | 341 | 332 | 324 | 316 | 308 | 300 | 292 | 283 | 275 |
| 980 | 267 | 259 | 251 | 243 | 234 | 226 | 218 | 210 | 202 | 194 |
| 990 | 186 | 178 | 170 | 162 | 154 | 146 | 138 | 130 | 122 | 114 |
| 1000 | 106 | 98 | 90 | 82 | 74 | 66 | 58 | 50 | 42 | 34 |
| 1010 | 26 | 18 | 10 | 2 | − 6 | − 13 | − 21 | − 29 | − 37 | − 45 |
| 1020 | − 53 | − 61 | − 68 | − 76 | − 84 | − 92 | −100 | −107 | −115 | −123 |
| 1030 | −131 | −138 | −146 | −154 | −162 | −169 | −177 | −185 | −192 | −200 |
| 1040 | −208 | −215 | −223 | −231 | −238 | −246 | −254 | −261 | −269 | −277 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## METRIC MEASURES.

### Temperature correction factor, $a = .00367\,\theta$.

Multiply approximate altitudes, determined from table 56 or 57, by values of $a$ corresponding to mean temperature, $\theta$, of air column. Add, if $\theta$ is above 0° C; subtract, if below 0° C.

| Mean Temp. $\theta$ | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| °C. | $a$. | $a$. | $a$. | $a$. | $a$. | $a$. | $a$. | $a$. | $a$. | $a$. |
| 0 | 0.000 | 0.000 | 0.001 | 0.001 | 0.001 | 0.002 | 0.002 | 0.003 | 0.003 | 0.003 |
| 1 | .004 | .004 | .004 | .005 | .005 | .006 | .006 | .006 | .007 | .007 |
| 2 | .007 | .008 | .008 | .008 | .009 | .009 | .010 | .010 | .010 | .011 |
| 3 | .011 | .011 | .012 | .012 | .012 | .013 | .013 | .014 | .014 | .014 |
| 4 | .015 | .015 | .015 | .016 | .016 | .017 | .017 | .017 | .018 | .018 |
| 5 | .018 | .019 | .019 | .019 | .020 | .020 | .021 | .021 | .021 | .022 |
| 6 | .022 | .022 | .023 | .023 | .023 | .024 | .024 | .025 | .025 | .025 |
| 7 | .026 | .026 | .026 | .027 | .027 | .028 | .028 | .028 | .029 | .029 |
| 8 | .029 | .030 | .030 | .030 | .031 | .031 | .032 | .032 | .032 | .033 |
| 9 | .033 | .033 | .034 | .034 | .034 | .035 | .035 | .036 | .036 | .036 |
| 10 | .037 | .037 | .037 | .038 | .038 | .039 | .039 | .039 | .040 | .040 |
| 11 | .040 | .041 | .041 | .041 | .042 | .042 | .043 | .043 | .043 | .044 |
| 12 | .044 | .044 | .045 | .045 | .046 | .046 | .046 | .047 | .047 | .047 |
| 13 | .048 | .048 | .048 | .049 | .049 | .050 | .050 | .050 | .051 | .051 |
| 14 | .051 | .052 | .052 | .052 | .053 | .053 | .054 | .054 | .054 | .055 |
| 15 | .055 | .055 | .056 | .056 | .057 | .057 | .057 | .058 | .058 | .058 |
| 16 | .059 | .059 | .059 | .060 | .060 | .061 | .061 | .061 | .062 | .062 |
| 17 | .062 | .063 | .063 | .063 | .064 | .064 | .065 | .065 | .065 | .066 |
| 18 | .066 | .066 | .067 | .067 | .068 | .068 | .068 | .069 | .069 | .069 |
| 19 | .070 | .070 | .070 | .071 | .071 | .072 | .072 | .072 | .073 | .073 |
| 20 | .073 | .074 | .074 | .075 | .075 | .075 | .076 | .076 | .076 | .077 |
| 21 | .077 | .077 | .078 | .078 | .079 | .079 | .079 | .080 | .080 | .080 |
| 22 | .081 | .081 | .081 | .082 | .082 | .083 | .083 | .083 | .084 | .084 |
| 23 | .084 | .085 | .085 | .086 | .086 | .086 | .087 | .087 | .087 | .088 |
| 24 | .088 | .088 | .089 | .089 | .090 | .090 | .090 | .091 | .091 | .091 |
| 25 | .092 | .092 | .092 | .093 | .093 | .094 | .094 | .094 | .095 | .095 |
| 26 | .095 | .096 | .096 | .097 | .097 | .097 | .098 | .098 | .098 | .099 |
| 27 | .099 | .099 | .100 | .100 | .101 | .101 | .101 | .102 | .102 | .102 |
| 28 | .103 | .103 | .103 | .104 | .104 | .105 | .105 | .105 | .106 | .106 |
| 29 | .106 | .107 | .107 | .108 | .108 | .108 | .109 | .109 | .109 | .110 |
| 30 | .110 | .110 | .111 | .111 | .112 | .112 | .112 | .113 | .113 | .113 |
| 31 | .114 | .114 | .115 | .115 | .115 | .116 | .116 | .116 | .117 | .117 |
| 32 | .117 | .118 | .118 | .119 | .119 | .119 | .120 | .120 | .120 | .121 |
| 33 | .121 | .121 | .122 | .122 | .123 | .123 | .123 | .124 | .124 | .124 |
| 34 | .125 | .125 | .126 | .126 | .126 | .127 | .127 | .127 | .128 | .128 |
| 35 | .128 | .129 | .129 | .130 | .130 | .130 | .131 | .131 | .131 | .132 |
| 36 | .132 | .132 | .133 | .133 | .134 | .134 | .134 | .135 | .135 | .135 |
| 37 | .136 | .136 | .137 | .137 | .137 | .138 | .138 | .138 | .139 | .139 |
| 38 | .139 | .140 | .140 | .141 | .141 | .141 | .142 | .142 | .142 | .143 |
| 39 | .143 | .143 | .144 | .144 | .145 | .145 | .145 | .146 | .146 | .146 |
| 40 | .147 | .147 | .148 | .148 | .148 | .149 | .149 | .149 | .150 | .150 |
| 41 | .150 | .151 | .151 | .152 | .152 | .152 | .153 | .153 | .153 | .154 |
| 42 | .154 | .155 | .155 | .155 | .156 | .156 | .156 | .157 | .157 | .157 |
| 43 | .158 | .158 | .159 | .159 | .159 | .160 | .160 | .160 | .161 | .161 |
| 44 | .161 | .162 | .162 | .163 | .163 | .163 | .164 | .164 | .164 | .165 |
| 45 | .165 | .166 | .166 | .166 | .167 | .167 | .167 | .168 | .168 | .168 |
| 46 | .169 | .169 | .170 | .170 | .170 | .171 | .171 | .171 | .172 | .172 |
| 47 | .172 | .173 | .173 | .174 | .174 | .174 | .175 | .175 | .175 | .176 |
| 48 | .176 | .177 | .177 | .177 | .178 | .178 | .178 | .179 | .179 | .179 |
| 49 | .180 | .180 | .181 | .181 | .181 | .182 | .182 | .182 | .183 | .183 |
| 50 | .184 | .184 | .184 | .185 | .185 | .185 | .186 | .186 | .186 | .187 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## METRIC MEASURES.

### Term for Temperature: $0.00367\,\theta \times z$.

For temperatures {above 0° C. / below 0° C.} the values are to be {added. / subtracted.}

| Approximate difference of height. z. | MEAN TEMPERATURE OF AIR COLUMN IN CENTIGRADE DEGREES ($\theta$). | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° | 10° | 20° | 30° | 40° |
| m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| **100** | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 7 | 11 | 15 |
| 200 | 1 | 1 | 2 | 3 | 4 | 4 | 5 | 6 | 7 | 7 | 15 | 22 | 29 |
| 300 | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 22 | 33 | 44 |
| 400 | 1 | 3 | 4 | 6 | 7 | 9 | 10 | 12 | 13 | 15 | 29 | 44 | 59 |
| **500** | 2 | 4 | 6 | 7 | 9 | 11 | 13 | 15 | 17 | 18 | 37 | 55 | 73 |
| 600 | 2 | 4 | 7 | 9 | 11 | 13 | 15 | 18 | 20 | 22 | 44 | 66 | 88 |
| 700 | 3 | 5 | 8 | 10 | 13 | 15 | 18 | 21 | 23 | 26 | 51 | 77 | 103 |
| 800 | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 23 | 26 | 29 | 59 | 88 | 117 |
| 900 | 3 | 7 | 10 | 13 | 17 | 20 | 23 | 26 | 30 | 33 | 66 | 99 | 132 |
| **1000** | 4 | 7 | 11 | 15 | 18 | 22 | 26 | 29 | 33 | 37 | 73 | 110 | 147 |
| 1100 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | 40 | 81 | 121 | 161 |
| 1200 | 4 | 9 | 13 | 18 | 22 | 26 | 31 | 35 | 40 | 44 | 88 | 132 | 176 |
| 1300 | 5 | 10 | 14 | 19 | 24 | 29 | 33 | 38 | 43 | 48 | 95 | 143 | 191 |
| 1400 | 5 | 10 | 15 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 103 | 154 | 206 |
| **1500** | 6 | 11 | 17 | 22 | 28 | 33 | 39 | 44 | 50 | 55 | 110 | 165 | 220 |
| 1600 | 6 | 12 | 18 | 23 | 29 | 35 | 41 | 47 | 53 | 59 | 117 | 176 | 235 |
| 1700 | 6 | 12 | 19 | 25 | 31 | 37 | 44 | 50 | 56 | 62 | 125 | 187 | 250 |
| 1800 | 7 | 13 | 20 | 26 | 33 | 40 | 46 | 53 | 59 | 66 | 132 | 198 | 264 |
| 1900 | 7 | 14 | 21 | 28 | 35 | 42 | 49 | 56 | 63 | 70 | 139 | 209 | 279 |
| **2000** | 7 | 15 | 22 | 29 | 37 | 44 | 51 | 59 | 66 | 73 | 147 | 220 | 294 |
| 2100 | 8 | 15 | 23 | 31 | 39 | 46 | 54 | 62 | 69 | 77 | 154 | 231 | 308 |
| 2200 | 8 | 16 | 24 | 32 | 40 | 48 | 57 | 65 | 73 | 81 | 161 | 242 | 323 |
| 2300 | 8 | 17 | 25 | 34 | 42 | 51 | 59 | 68 | 76 | 84 | 169 | 253 | 338 |
| 2400 | 9 | 18 | 26 | 35 | 44 | 53 | 62 | 70 | 79 | 88 | 176 | 264 | 352 |
| **2500** | 9 | 18 | 28 | 37 | 46 | 55 | 64 | 73 | 83 | 92 | 184 | 275 | 367 |
| 2600 | 10 | 19 | 29 | 38 | 48 | 57 | 67 | 76 | 86 | 95 | 191 | 286 | 382 |
| 2700 | 10 | 20 | 30 | 40 | 50 | 59 | 69 | 79 | 89 | 99 | 198 | 297 | 396 |
| 2800 | 10 | 21 | 31 | 41 | 51 | 62 | 72 | 82 | 92 | 103 | 206 | 308 | 411 |
| 2900 | 11 | 21 | 32 | 43 | 53 | 64 | 75 | 85 | 96 | 106 | 213 | 319 | 426 |
| **3000** | 11 | 22 | 33 | 44 | 55 | 66 | 77 | 88 | 99 | 110 | 220 | 330 | 440 |
| 3100 | 11 | 23 | 34 | 46 | 57 | 68 | 80 | 91 | 102 | 114 | 228 | 341 | 455 |
| 3200 | 12 | 23 | 35 | 47 | 59 | 70 | 82 | 94 | 106 | 117 | 235 | 352 | 470 |
| 3300 | 12 | 24 | 36 | 48 | 61 | 73 | 85 | 97 | 109 | 121 | 242 | 363 | 484 |
| 3400 | 12 | 25 | 37 | 50 | 62 | 75 | 87 | 100 | 112 | 125 | 250 | 374 | 499 |
| **3500** | 13 | 26 | 39 | 51 | 64 | 77 | 90 | 103 | 116 | 128 | 257 | 385 | 514 |
| 3600 | 13 | 26 | 40 | 53 | 66 | 79 | 92 | 106 | 119 | 132 | 264 | 396 | 528 |
| 3700 | 14 | 27 | 41 | 54 | 68 | 81 | 95 | 109 | 122 | 136 | 272 | 407 | 543 |
| 3800 | 14 | 28 | 42 | 56 | 70 | 84 | 98 | 112 | 126 | 139 | 279 | 418 | 558 |
| 3900 | 14 | 29 | 43 | 57 | 72 | 86 | 100 | 115 | 129 | 143 | 286 | 429 | 573 |
| **4000** | 15 | 29 | 44 | 59 | 73 | 88 | 103 | 117 | 132 | 147 | 294 | 440 | 587 |
| 5000 | 18 | 37 | 55 | 73 | 92 | 110 | 128 | 147 | 165 | 183 | 367 | 551 | 734 |
| 6000 | 22 | 44 | 66 | 88 | 110 | 132 | 154 | 176 | 198 | 220 | 440 | 661 | 881 |
| 7000 | 26 | 51 | 77 | 103 | 128 | 154 | 180 | 206 | 231 | 257 | 514 | 771 | 1028 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## METRIC MEASURES.

### Correction for Humidity: Values of 10000 $\beta$.

$$\beta = 0.378 \frac{e}{b} = 0.378 \frac{e_1 + e_0}{B + B_0}.$$

| Mean Vapor Pressure. $e = \frac{e_1+e_0}{2}$ | Mean barometric pressure in millimeters $\left(\frac{B+B_0}{2}\right)$. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 500 | 520 | 540 | 560 | 580 | 600 | 620 | 640 | 660 | 680 | 700 | 720 | 740 | 760 |
| mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 1 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 2 | 15 | 15 | 14 | 14 | 13 | 13 | 12 | 12 | 11 | 11 | 11 | 11 | 10 | 10 |
| 3 | 23 | 22 | 21 | 20 | 20 | 19 | 18 | 18 | 17 | 17 | 16 | 16 | 15 | 15 |
| 4 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 24 | 23 | 22 | 22 | 21 | 20 | 20 |
| 5 | 38 | 36 | 35 | 34 | 33 | 31 | 30 | 30 | 29 | 28 | 27 | 26 | 26 | 25 |
| 6 | 45 | 44 | 42 | 41 | 39 | 38 | 37 | 35 | 34 | 33 | 32 | 32 | 31 | 30 |
| 7 | 53 | 51 | 49 | 47 | 46 | 44 | 43 | 41 | 40 | 39 | 38 | 37 | 36 | 35 |
| 8 | 60 | 58 | 56 | 54 | 52 | 50 | 49 | 47 | 46 | 44 | 43 | 42 | 41 | 40 |
| 9 | 68 | 65 | 63 | 61 | 59 | 57 | 55 | 53 | 52 | 50 | 49 | 47 | 46 | 45 |
| 10 | 76 | 73 | 70 | 68 | 65 | 63 | 61 | 59 | 57 | 56 | 54 | 53 | 51 | 50 |
| 11 | 83 | 80 | 77 | 74 | 72 | 69 | 67 | 65 | 63 | 61 | 59 | 58 | 56 | 55 |
| 12 | 91 | 87 | 84 | 81 | 78 | 76 | 73 | 71 | 69 | 67 | 65 | 63 | 61 | 60 |
| 13 | 98 | 95 | 91 | 88 | 85 | 82 | 79 | 77 | 74 | 72 | 70 | 68 | 66 | 65 |
| 14 | 106 | 102 | 98 | 95 | 91 | 88 | 85 | 83 | 80 | 78 | 76 | 74 | 72 | 70 |
| 15 | 113 | 109 | 105 | 101 | 98 | 95 | 91 | 89 | 86 | 83 | 81 | 79 | 77 | 75 |
| 16 | 121 | 116 | 112 | 108 | 104 | 101 | 98 | 94 | 92 | 89 | 86 | 84 | 82 | 80 |
| 17 | 129 | 124 | 119 | 115 | 111 | 107 | 104 | 100 | 97 | 94 | 92 | 89 | 87 | 85 |
| 18 | 136 | 131 | 126 | 122 | 117 | 113 | 110 | 106 | 103 | 100 | 97 | 95 | 92 | 90 |
| 19 | 144 | 138 | 133 | 128 | 124 | 120 | 116 | 112 | 109 | 106 | 103 | 100 | 97 | 95 |
| 20 | 151 | 145 | 140 | 135 | 130 | 126 | 122 | 118 | 115 | 111 | 108 | 105 | 102 | 99 |
| 21 | 159 | 153 | 147 | 142 | 137 | 132 | 128 | 124 | 120 | 117 | 113 | 110 | 107 | 104 |
| 22 | 166 | 160 | 154 | 149 | 143 | 139 | 134 | 130 | 126 | 122 | 119 | 116 | 112 | 109 |
| 23 | 174 | 167 | 161 | 155 | 150 | 145 | 140 | 136 | 132 | 128 | 124 | 121 | 117 | 114 |
| 24 | 181 | 174 | 168 | 162 | 156 | 151 | 146 | 142 | 137 | 133 | 130 | 126 | 123 | 119 |
| 25 | 189 | 182 | 175 | 169 | 163 | 157 | 152 | 148 | 143 | 139 | 135 | 131 | 128 | 124 |
| 26 | 197 | 189 | 182 | 175 | 169 | 164 | 159 | 154 | 149 | 145 | 140 | 137 | 133 | 129 |
| 27 | 204 | 196 | 189 | 182 | 176 | 170 | 165 | 159 | 155 | 150 | 146 | 142 | 138 | 134 |
| 28 | 212 | 204 | 196 | 189 | 182 | 176 | 171 | 165 | 160 | 156 | 151 | 147 | 143 | 139 |
| 29 | 219 | 211 | 203 | 196 | 189 | 183 | 177 | 171 | 166 | 161 | 157 | 152 | 148 | 144 |
| 30 | 227 | 218 | 210 | 203 | 196 | 189 | 183 | 177 | 172 | 167 | 162 | 158 | 153 | 149 |
| 31 | 234 | 225 | 217 | 209 | 202 | 195 | 189 | 183 | 178 | 172 | 167 | 163 | 158 | 154 |
| 32 | 242 | 233 | 224 | 216 | 209 | 202 | 195 | 189 | 183 | 178 | 173 | 168 | 163 | 159 |
| 33 | 249 | 240 | 231 | 223 | 215 | 208 | 201 | 195 | 189 | 183 | 178 | 173 | 169 | 164 |
| 34 | 257 | 247 | 238 | 230 | 222 | 214 | 207 | 201 | 195 | 189 | 184 | 179 | 174 | 169 |
| 35 | 265 | 254 | 245 | 236 | 228 | 220 | 213 | 207 | 200 | 195 | 189 | 184 | 179 | 174 |
| 36 | 272 | 262 | 252 | 243 | 235 | 227 | 219 | 213 | 206 | 200 | 194 | 189 | 184 | 179 |
| 37 | 280 | 269 | 259 | 250 | 241 | 233 | 226 | 219 | 212 | 206 | 200 | 194 | 189 | 184 |
| 38 | 287 | 276 | 266 | 257 | 248 | 239 | 232 | 224 | 218 | 211 | 205 | 200 | 194 | 189 |
| 39 | 295 | 283 | 273 | 263 | 254 | 246 | 238 | 230 | 223 | 217 | 211 | 205 | 199 | 194 |
| 40 | 302 | 291 | 280 | 270 | 261 | 252 | 244 | 236 | 229 | 222 | 216 | 210 | 204 | 199 |

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## METRIC MEASURES.

### Correction for Humidity: $10000\beta \times z$.

Top argument: Values of $10000\beta$ obtained from page
Side argument: Approximate difference of height (z).

| Approximate Difference of Height. z. | $10000\beta$. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 25 | 50 | 75 | 100 | 125 | 150 | 175 | 200 | 225 | 250 | 275 | 300 |
| m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| 100 | 0.3 | 0.5 | 0.8 | 1.0 | 1.3 | 1.5 | 1.8 | 2.0 | 2.3 | 2.5 | 2.8 | 3.0 |
| 200 | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 |
| 300 | 0.8 | 1.5 | 2.3 | 3.0 | 3.8 | 4.5 | 5.3 | 6.0 | 6.8 | 7.5 | 8.3 | 9.0 |
| 400 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 | 11.0 | 12.0 |
| 500 | 1.3 | 2.5 | 3.8 | 5.0 | 6.3 | 7.5 | 8.8 | 10.0 | 11.3 | 12.5 | 13.8 | 15.0 |
| 600 | 1.5 | 3.0 | 4.5 | 6.0 | 7.5 | 9.0 | 10.5 | 12.0 | 13.5 | 15.0 | 16.5 | 18.0 |
| 700 | 1.8 | 3.5 | 5.3 | 7.0 | 8.8 | 10.5 | 12.3 | 14.0 | 15.8 | 17.5 | 19.3 | 21.0 |
| 800 | 2.0 | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 24.0 |
| 900 | 2.3 | 4.5 | 6.8 | 9.0 | 11.3 | 13.5 | 15.8 | 18.0 | 20.3 | 22.5 | 24.8 | 27.0 |
| 1000 | 2.5 | 5.0 | 7.5 | 10.0 | 12.5 | 15.0 | 17.5 | 20.0 | 22.5 | 25.0 | 27.5 | 30.0 |
| 1100 | 2.8 | 5.5 | 8.3 | 11.0 | 13.8 | 16.5 | 19.3 | 22.0 | 24.8 | 27.5 | 30.3 | 33.0 |
| 1200 | 3.0 | 6.0 | 9.0 | 12.0 | 15.0 | 18.0 | 21.0 | 24.0 | 27.0 | 30.0 | 33.0 | 36.0 |
| 1300 | 3.3 | 6.5 | 9.8 | 13.0 | 16.3 | 19.5 | 22.8 | 26.0 | 29.3 | 32.5 | 35.8 | 39.0 |
| 1400 | 3.5 | 7.0 | 10.5 | 14.0 | 17.5 | 21.0 | 24.5 | 28.0 | 31.5 | 35.0 | 38.5 | 42.0 |
| 1500 | 3.8 | 7.5 | 11.3 | 15.0 | 18.8 | 22.5 | 26.3 | 30.0 | 33.8 | 37.5 | 41.3 | 45.0 |
| 1600 | 4.0 | 8.0 | 12.0 | 16.0 | 20.0 | 24.0 | 28.0 | 32.0 | 36.0 | 40.0 | 44.0 | 48.0 |
| 1700 | 4.3 | 8.5 | 12.8 | 17.0 | 21.3 | 25.5 | 29.8 | 34.0 | 38.3 | 42.5 | 46.8 | 51.0 |
| 1800 | 4.5 | 9.0 | 13.5 | 18.0 | 22.5 | 27.0 | 31.5 | 36.0 | 40.5 | 45.0 | 49.5 | 54.0 |
| 1900 | 4.8 | 9.5 | 14.3 | 19.0 | 23.8 | 28.5 | 33.3 | 38.0 | 42.8 | 47.5 | 52.3 | 57.0 |
| 2000 | 5.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | 55.0 | 60.0 |
| 2100 | 5.3 | 10.5 | 15.8 | 21.0 | 26.3 | 31.5 | 36.8 | 42.0 | 47.3 | 52.5 | 57.8 | 63.0 |
| 2200 | 5.5 | 11.0 | 16.5 | 22.0 | 27.5 | 33.0 | 38.5 | 44.0 | 49.5 | 55.0 | 60.5 | 66.0 |
| 2300 | 5.8 | 11.5 | 17.3 | 23.0 | 28.8 | 34.5 | 40.3 | 46.0 | 51.8 | 57.5 | 63.3 | 69.0 |
| 2400 | 6.0 | 12.0 | 18.0 | 24.0 | 30.0 | 36.0 | 42.0 | 48.0 | 54.0 | 60.0 | 66.0 | 72.0 |
| 2500 | 6.3 | 12.5 | 18.8 | 25.0 | 31.3 | 37.5 | 43.8 | 50.0 | 56.3 | 62.5 | 68.8 | 75.0 |
| 2600 | 6.5 | 13.0 | 19.5 | 26.0 | 32.5 | 39.0 | 45.5 | 52.0 | 58.5 | 65.0 | 71.5 | 78.0 |
| 2700 | 6.8 | 13.5 | 20.3 | 27.0 | 33.8 | 40.5 | 47.3 | 54.0 | 60.8 | 67.5 | 74.3 | 81.0 |
| 2800 | 7.0 | 14.0 | 21.0 | 28.0 | 35.0 | 42.0 | 49.0 | 56.0 | 63.0 | 70.0 | 77.0 | 84.0 |
| 2900 | 7.3 | 14.5 | 21.8 | 29.0 | 36.3 | 43.5 | 50.8 | 58.0 | 65.3 | 72.5 | 79.8 | 87.0 |
| 3000 | 7.5 | 15.0 | 22.5 | 30.0 | 37.5 | 45.0 | 52.5 | 60.0 | 67.5 | 75.0 | 82.5 | 90.0 |
| 3100 | 7.8 | 15.5 | 23.3 | 31.0 | 38.8 | 46.5 | 54.3 | 62.0 | 69.8 | 77.5 | 85.3 | 93.0 |
| 3200 | 8.0 | 16.0 | 24.0 | 32.0 | 40.0 | 48.0 | 56.0 | 64.0 | 72.0 | 80.0 | 88.0 | 96.0 |
| 3300 | 8.3 | 16.5 | 24.8 | 33.0 | 41.3 | 49.5 | 57.8 | 66.0 | 74.3 | 82.5 | 90.8 | 99.0 |
| 3400 | 8.5 | 17.0 | 25.5 | 34.0 | 42.5 | 51.0 | 59.5 | 68.0 | 76.5 | 85.0 | 93.5 | 102.0 |
| 3500 | 8.8 | 17.5 | 26.3 | 35.0 | 43.8 | 52.5 | 61.3 | 70.0 | 78.8 | 87.5 | 96.3 | 105.0 |
| 3600 | 9.0 | 18.0 | 27.0 | 36.0 | 45.0 | 54.0 | 63.0 | 72.0 | 81.0 | 90.0 | 99.0 | 108.0 |
| 3700 | 9.3 | 18.5 | 27.8 | 37.0 | 46.3 | 55.5 | 64.8 | 74.0 | 83.3 | 92.5 | 101.8 | 111.0 |
| 3800 | 9.5 | 19.0 | 28.5 | 38.0 | 47.5 | 57.0 | 66.5 | 76.0 | 85.5 | 95.0 | 104.5 | 114.0 |
| 3900 | 9.8 | 19.5 | 29.3 | 39.0 | 48.8 | 58.5 | 68.3 | 78.0 | 87.8 | 97.5 | 107.3 | 117.0 |
| 4000 | 10.0 | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 70.0 | 80.0 | 90.0 | 100.0 | 110.0 | 120.0 |
| 5000 | 12.5 | 25.0 | 37.5 | 50.0 | 62.5 | 75.0 | 87.5 | 100.0 | 112.5 | 125.0 | 137.5 | 150.0 |
| 6000 | 15.0 | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 105.0 | 120.0 | 135.0 | 150.0 | 165.0 | 180.0 |
| 7000 | 17.5 | 35.0 | 52.5 | 70.0 | 87.5 | 105.0 | 122.5 | 140.0 | 157.5 | 175.0 | 192.5 | 210.0 |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### METRIC MEASURES.

**Correction for Humidity:** Values of $\frac{1}{2}\left(\frac{0.378\frac{e}{b}}{0.00367}\right)$

Top argument: Values of $e$.
Side argument: Values of $b$. Auxiliary to Table 58.

| Air Pressure. | VAPOR PRESSURE mm. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 20 | 30 |
| mm. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. |
| 780 | 0.0 | 0.1 | 0.1 | 0.2 | 0.3 | 0.3 | 0.4 | 0.5 | 0.5 | 0.6 | 0.7 | 1.3 | 2.0 |
| 760 | .0 | .1 | .1 | .2 | .3 | .3 | .4 | .5 | .5 | .6 | .7 | 1.4 | 2.0 |
| 740 | .0 | .1 | .1 | .2 | .3 | .4 | .4 | .5 | .6 | .6 | .7 | 1.4 | 2.1 |
| 720 | .0 | .1 | .1 | .2 | .3 | .4 | .4 | .5 | .6 | .6 | .7 | 1.4 | 2.1 |
| 700 | .0 | .1 | .2 | .2 | .3 | .4 | .4 | .5 | .6 | .7 | .7 | 1.5 | 2.2 |
| 680 | .0 | .1 | .2 | .2 | .3 | .4 | .4 | .5 | .6 | .7 | .8 | 1.5 | |
| 660 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .5 | .6 | .7 | .8 | 1.6 | |
| 640 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .6 | .6 | .7 | .8 | 1.6 | |
| 620 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .8 | 1.7 | |
| 600 | .0 | .1 | .2 | .3 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 1.7 | |
| 580 | .0 | .1 | .2 | .3 | .4 | .4 | .5 | .6 | .7 | .8 | .9 | | |
| 560 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .5 | .7 | .8 | .9 | | |
| 540 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 1.0 | | |
| 520 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | | | |
| 500 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | | | |
| 480 | .1 | .1 | .2 | .3 | .4 | .5 | .6 | .8 | | | | | |
| 460 | .1 | .1 | .2 | .3 | .4 | .6 | .7 | .8 | | | | | |
| 440 | .1 | .1 | .2 | .4 | .5 | .6 | .7 | | | | | | |
| 420 | .1 | .1 | .2 | .4 | .5 | .6 | .7 | | | | | | |
| 400 | .1 | .1 | .3 | .4 | .5 | .6 | | | | | | | |
| 380 | .1 | .1 | .3 | .4 | .5 | | | | | | | | |
| 360 | .1 | .1 | .3 | .4 | .6 | | | | | | | | |
| 340 | .1 | .2 | .3 | .4 | | | | | | | | | |
| 320 | .1 | .2 | .3 | .5 | | | | | | | | | |
| 300 | .1 | .2 | .3 | | | | | | | | | | |
| 280 | .1 | .2 | .4 | | | | | | | | | | |
| 260 | .1 | .2 | .4 | | | | | | | | | | |
| 240 | .1 | .2 | .4 | | | | | | | | | | |
| 220 | .1 | .2 | | | | | | | | | | | |
| 200 | .1 | .3 | | | | | | | | | | | |
| 180 | .1 | .3 | | | | | | | | | | | |
| 160 | .2 | .3 | | | | | | | | | | | |
| 140 | .2 | .4 | | | | | | | | | | | |
| 120 | .2 | .4 | | | | | | | | | | | |
| 100 | .3 | .5 | | | | | | | | | | | |
| 80 | .3 | | | | | | | | | | | | |
| 60 | .4 | | | | | | | | | | | | |
| 40 | .6 | | | | | | | | | | | | |
| 20 | 1.3 | | | | | | | | | | | | |
| 10 | 2.6 | | | | | | | | | | | | |

TABLE 61.

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## DYNAMIC MEASURES.

**Correction for Humidity:** Values of $\frac{1}{2}\left(\frac{0.378\frac{e}{b}}{0.00367}\right)$

Top argument: Values of $e$.
Side argument: Values of $b$. Auxiliary to Table 58.

| Air Pressure. | VAPOR PRESSURE mb. | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.5 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 20 | 30 | 40 |
| mb. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. | °C. |
| 1080 | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 0.3 | 0.4 | 0.4 | 0.5 | 1.0 | 1.4 | 1.9 |
| 1060 | .0 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | 1.0 | 1.5 | 1.9 |
| 1040 | .0 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | 1.0 | 1.5 | 2.0 |
| 1020 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | .5 | 1.0 | 1.5 | 2.0 |
| 1000 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | .5 | 1.0 | 1.5 | 2.1 |
| 980 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | .5 | 1.1 | 1.6 | 2.1 |
| 960 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | .5 | 1.1 | 1.6 | 2.1 |
| 940 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | .5 | 1.1 | 1.6 | 2.2 |
| 920 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .4 | .5 | .6 | 1.1 | 1.7 | 2.2 |
| 900 | .0 | .1 | .1 | .2 | .2 | .3 | .3 | .4 | .5 | .5 | .6 | 1.1 | 1.7 | 2.3 |
| 880 | .0 | .1 | .1 | .2 | .2 | .3 | .4 | .4 | .5 | .5 | .6 | 1.2 | 1.8 | 2.3 |
| 860 | .0 | .1 | .1 | .2 | .2 | .3 | .4 | .4 | .5 | .5 | .6 | 1.2 | 1.8 | 2.4 |
| 840 | .0 | .1 | .1 | .2 | .2 | .3 | .4 | .4 | .5 | .6 | .6 | 1.2 | 1.8 | |
| 820 | .0 | .1 | .1 | .2 | .3 | .3 | .4 | .4 | .5 | .6 | .6 | 1.3 | 1.9 | |
| 800 | .0 | .1 | .1 | .2 | .3 | .3 | .4 | .5 | .5 | .6 | .6 | 1.3 | 1.9 | |
| 780 | .0 | .1 | .1 | .2 | .3 | .3 | .4 | .5 | .5 | .6 | .7 | 1.3 | 2.0 | |
| 760 | .0 | .1 | .1 | .2 | .3 | .3 | .4 | .5 | .5 | .6 | .7 | 1.4 | | |
| 740 | .0 | .1 | .1 | .2 | .3 | .3 | .4 | .5 | .6 | .6 | .7 | 1.4 | | |
| 720 | .0 | .1 | .1 | .2 | .3 | .4 | .4 | .5 | .6 | .6 | .7 | 1.4 | | |
| 700 | .0 | .1 | .1 | .2 | .3 | .4 | .4 | .5 | .6 | .7 | .7 | 1.5 | | |
| 680 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .5 | .6 | .7 | .8 | | | |
| 660 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .5 | .6 | .7 | .8 | | | |
| 640 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .6 | .6 | .7 | .8 | | | |
| 620 | .0 | .1 | .2 | .2 | .3 | .4 | .5 | .6 | .7 | .7 | | | | |
| 600 | .0 | .1 | .2 | .3 | .3 | .4 | .5 | .6 | .7 | .8 | | | | |
| 580 | .0 | .1 | .2 | .3 | .4 | .4 | .5 | .6 | .7 | .8 | | | | |
| 560 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .6 | .7 | | | | | |
| 540 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | | | | | |
| 520 | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | | | | | |
| 500 | .1 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | | | | | | |
| 480 | .1 | .1 | .2 | .3 | .4 | .5 | .6 | .8 | | | | | | |
| 460 | .1 | .1 | .2 | .3 | .4 | .6 | .7 | .8 | | | | | | |
| 440 | .1 | .1 | .2 | .4 | .5 | .6 | .7 | | | | | | | |
| 420 | .1 | .1 | .2 | .4 | .5 | .6 | .7 | | | | | | | |
| 400 | .1 | .1 | .3 | .4 | .5 | .6 | .8 | | | | | | | |
| 380 | .1 | .1 | .3 | .4 | .5 | .7 | | | | | | | | |
| 360 | .1 | .1 | .3 | .4 | .6 | .7 | | | | | | | | |
| 340 | .1 | .2 | .3 | .5 | .6 | .8 | | | | | | | | |
| 320 | .1 | .2 | .3 | .5 | .6 | | | | | | | | | |
| 300 | .1 | .2 | .3 | .5 | .7 | | | | | | | | | |
| 280 | .1 | .2 | .4 | .6 | .7 | | | | | | | | | |
| 260 | .1 | .2 | .4 | .6 | | | | | | | | | | |
| 240 | .1 | .2 | .4 | .6 | | | | | | | | | | |
| 220 | .1 | .2 | .5 | .7 | | | | | | | | | | |
| 200 | .1 | .3 | .5 | | | | | | | | | | | |

| Air Pressure. | VAPOR PRESSURE mb. | | |
|---|---|---|---|
| | 0.5 | 1 | 2 |
| mb. | °C. | °C. | °C. |
| 180 | .1 | .3 | .6 |
| 160 | .2 | .3 | .6 |
| 140 | .2 | .4 | |
| 120 | .2 | .4 | |
| 100 | .3 | .5 | |
| 80 | .3 | | |
| 60 | .4 | | |
| 40 | .6 | | |
| 20 | 1.3 | | |
| 10 | 2.6 | | |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### METRIC MEASURES.

Correction for Gravity and Weight of Mercury : $z(0.002640 \cos 2\phi - 0.000007 \cos^2 2\phi + 0.00244)$.

| Approximate difference of Height. Z. | LATITUDE ($\phi$) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° |
| Meters. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| 100 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 200 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 300 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| 400 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| 500 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 600 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| 700 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 | 0 |
| 800 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 |
| 900 | 5 | 5 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | 0 | 0 |
| 1000 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 0 | 0 |
| 1100 | 6 | 6 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 2 | 2 | 1 | 1 | 0 | 0 |
| 1200 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 4 | 3 | 3 | 2 | 2 | 1 | 1 | 0 | 0 |
| 1300 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 4 | 4 | 3 | 3 | 2 | 1 | 1 | 1 | 0 |
| 1400 | 7 | 7 | 7 | 7 | 6 | 6 | 5 | 5 | 4 | 3 | 3 | 2 | 2 | 1 | 1 | 0 |
| 1500 | 8 | 8 | 7 | 7 | 7 | 6 | 6 | 5 | 4 | 4 | 3 | 2 | 2 | 1 | 1 | 0 |
| 1600 | 8 | 8 | 8 | 8 | 7 | 7 | 6 | 5 | 5 | 4 | 3 | 2 | 2 | 1 | 1 | 0 |
| 1700 | 9 | 9 | 8 | 8 | 8 | 7 | 6 | 6 | 5 | 4 | 3 | 3 | 2 | 1 | 1 | 0 |
| 1800 | 9 | 9 | 9 | 8 | 8 | 7 | 7 | 6 | 5 | 4 | 4 | 3 | 2 | 1 | 1 | 0 |
| 1900 | 10 | 10 | 9 | 9 | 8 | 8 | 7 | 6 | 5 | 5 | 4 | 3 | 2 | 1 | 1 | 0 |
| 2000 | 10 | 10 | 10 | 9 | 9 | 8 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 1 | 0 |
| 2100 | 11 | 11 | 10 | 10 | 9 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 2 | 1 | 0 |
| 2200 | 11 | 11 | 11 | 10 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 2 | 1 | 0 |
| 2300 | 12 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 2400 | 12 | 12 | 12 | 11 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 2500 | 13 | 13 | 12 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 2600 | 13 | 13 | 13 | 12 | 12 | 11 | 10 | 9 | 8 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 2700 | 14 | 14 | 13 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 5 | 4 | 3 | 2 | 1 | 0 |
| 2800 | 14 | 14 | 14 | 13 | 12 | 12 | 11 | 9 | 8 | 7 | 6 | 4 | 3 | 2 | 1 | 0 |
| 2900 | 15 | 15 | 14 | 14 | 13 | 12 | 11 | 10 | 8 | 7 | 6 | 4 | 3 | 2 | 1 | 0 |
| 3000 | 15 | 15 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 7 | 6 | 5 | 3 | 2 | 1 | 0 |
| 3100 | 16 | 16 | 15 | 15 | 14 | 13 | 12 | 10 | 9 | 8 | 6 | 5 | 3 | 2 | 1 | 0 |
| 3200 | 16 | 16 | 16 | 15 | 14 | 13 | 12 | 11 | 9 | 8 | 6 | 5 | 4 | 2 | 1 | 0 |
| 3300 | 17 | 17 | 16 | 16 | 15 | 14 | 12 | 11 | 10 | 8 | 7 | 5 | 4 | 2 | 1 | 0 |
| 3400 | 17 | 17 | 17 | 16 | 15 | 14 | 13 | 11 | 10 | 8 | 7 | 5 | 4 | 2 | 1 | 0 |
| 3500 | 18 | 18 | 17 | 17 | 16 | 14 | 13 | 12 | 10 | 9 | 7 | 5 | 4 | 3 | 1 | 1 |
| 3600 | 18 | 18 | 18 | 17 | 16 | 15 | 14 | 12 | 10 | 9 | 7 | 5 | 4 | 3 | 1 | 1 |
| 3700 | 19 | 19 | 18 | 17 | 16 | 15 | 14 | 12 | 11 | 9 | 7 | 6 | 4 | 3 | 2 | 1 |
| 3800 | 19 | 19 | 19 | 18 | 17 | 16 | 14 | 13 | 11 | 9 | 8 | 6 | 4 | 3 | 2 | 1 |
| 3900 | 20 | 20 | 19 | 18 | 17 | 16 | 15 | 13 | 11 | 9 | 8 | 6 | 4 | 3 | 2 | 1 |
| 4000 | 20 | 20 | 20 | 19 | 18 | 17 | 15 | 13 | 12 | 10 | 8 | 6 | 4 | 3 | 2 | 1 |
| 4500 | 23 | 23 | 22 | 21 | 20 | 19 | 17 | 15 | 13 | 11 | 9 | 7 | 5 | 3 | 2 | 1 |
| 5000 | 25 | 25 | 25 | 24 | 22 | 21 | 19 | 17 | 14 | 12 | 10 | 8 | 6 | 4 | 2 | 1 |
| 5500 | 28 | 28 | 27 | 26 | 24 | 23 | 21 | 18 | 16 | 13 | 11 | 8 | 6 | 4 | 2 | 1 |
| 6000 | 30 | 30 | 29 | 28 | 27 | 25 | 23 | 20 | 17 | 15 | 12 | 9 | 7 | 4 | 2 | 1 |
| 6500 | 33 | 33 | 32 | 31 | 29 | 27 | 24 | 22 | 19 | 16 | 13 | 10 | 7 | 5 | 3 | 1 |
| 7000 | 35 | 35 | 34 | 33 | 31 | 29 | 26 | 23 | 20 | 17 | 14 | 11 | 8 | 5 | 3 | 1 |

TABLE 63.

# DETERMINATION OF HEIGHTS BY THE BAROMETER.

## METRIC MEASURES.

**Correction for the variation of gravity with altitude:** $\frac{z(z+2h_0)}{R}$

| Approximate difference of height. Z. | HEIGHT OF LOWER STATION IN METERS ($h_0$). | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 200 | 400 | 600 | 800 | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2500 | 3000 | 4000 |
| meters. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. | m. |
| **200** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 400 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **500** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 600 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| 700 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 800 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 900 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **1000** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1100 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 1200 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 1300 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| 1400 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| **1500** | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| 1600 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| 1700 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 3 |
| 1800 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 |
| 1900 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 |
| **2000** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |
| 2100 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |
| 2200 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 4 |
| 2300 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 |
| 2400 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 4 |
| **2500** | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 |
| 2600 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 |
| 2700 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 5 |
| 2800 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 5 |
| 2900 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 5 |
| **3000** | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 |
| 3100 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 |
| 3200 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 6 |
| 3300 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 6 |
| 3400 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 6 |
| **3500** | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 6 |
| 3600 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 7 |
| 3700 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 5 | 6 | 7 |
| 3800 | 2 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 6 | 7 |
| 3900 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 7 |
| **4000** | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 6 | 8 |
| 4500 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 7 | 7 | 9 |
| 5000 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 8 | 9 | 10 |
| 5500 | 5 | 5 | 5 | 6 | 6 | 6 | 7 | 7 | 8 | 8 | 8 | 9 | 10 | 12 |
| 6000 | 6 | 6 | 6 | 7 | 7 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 11 | 13 |
| **6500** | 7 | 7 | 7 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 11 | 12 | 13 | 15 |
| 7000 | 8 | 8 | 9 | 9 | 9 | 10 | 10 | 11 | 11 | 12 | 12 | 13 | 14 | 16 |

# DIFFERENCE OF HEIGHT CORRESPONDING TO A CHANGE OF 0.1 INCH IN THE BAROMETER.

## ENGLISH MEASURES.

| Barometric Pressure. | Mean temperature of the air in Fahrenheit degrees. | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° |
| Inches | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. | Feet. |
| 22.0 | 119.2 | 120.5 | 121.8 | 123.1 | 124.4 | 125.8 | 127.1 | 128.5 | 129.8 | 131.2 | 132.5 | 133.9 |
| .2 | 118.2 | 119.4 | 120.7 | 122.0 | 123.3 | 124.7 | 126.0 | 127.3 | 128.7 | 130.0 | 131.3 | 132.7 |
| .4 | 117.1 | 118.3 | 119.6 | 120.9 | 122.2 | 123.6 | 124.9 | 126.2 | 127.5 | 128.8 | 130.2 | 131.5 |
| .6 | 116.1 | 117.3 | 118.6 | 119.8 | 121.1 | 122.5 | 123.8 | 125.1 | 126.4 | 127.7 | 129.0 | 130.3 |
| .8 | 115.0 | 116.3 | 117.5 | 118.8 | 120.1 | 121.4 | 122.7 | 124.0 | 125.3 | 126.6 | 127.9 | 129.2 |
| 23.0 | 114.0 | 115.3 | 116.5 | 117.8 | 119.0 | 120.3 | 121.6 | 122.9 | 124.2 | 125.5 | 126.8 | 128.1 |
| .2 | 113.1 | 114.3 | 115.5 | 116.8 | 118.0 | 119.3 | 120.6 | 121.8 | 123.1 | 124.4 | 125.7 | 127.0 |
| .4 | 112.1 | 113.3 | 114.5 | 115.8 | 117.0 | 118.3 | 119.5 | 120.8 | 122.1 | 123.3 | 124.6 | 125.9 |
| .6 | 111.1 | 112.3 | 113.5 | 114.8 | 116.0 | 117.3 | 118.5 | 119.8 | 121.0 | 122.3 | 123.5 | 124.8 |
| .8 | 110.2 | 111.4 | 112.6 | 113.8 | 115.1 | 116.3 | 117.5 | 118.8 | 120.0 | 121.3 | 122.5 | 123.8 |
| 24.0 | 109.3 | 110.5 | 111.7 | 112.9 | 114.1 | 115.3 | 116.5 | 117.8 | 119.0 | 120.2 | 121.5 | 122.7 |
| .2 | 108.4 | 109.5 | 110.7 | 111.9 | 113.1 | 114.4 | 115.6 | 116.8 | 118.0 | 119.2 | 120.5 | 121.7 |
| .4 | 107.5 | 108.6 | 109.8 | 111.0 | 112.2 | 113.4 | 114.6 | 115.9 | 117.1 | 118.3 | 119.5 | 120.7 |
| .6 | 106.6 | 107.8 | 108.9 | 110.1 | 111.3 | 112.5 | 113.7 | 114.9 | 116.1 | 117.3 | 118.5 | 119.7 |
| .8 | 105.8 | 106.9 | 108.1 | 109.2 | 110.4 | 111.6 | 112.8 | 114.0 | 115.2 | 116.4 | 117.6 | 118.8 |
| 25.0 | 104.9 | 106.0 | 107.2 | 108.3 | 109.5 | 110.7 | 111.9 | 113.1 | 114.2 | 115.4 | 116.6 | 117.8 |
| .2 | 104.1 | 105.2 | 106.3 | 107.5 | 108.7 | 109.8 | 111.0 | 112.2 | 113.3 | 114.5 | 115.7 | 116.9 |
| .4 | 103.3 | 104.4 | 105.5 | 106.6 | 107.8 | 109.0 | 110.1 | 111.3 | 112.4 | 113.6 | 114.8 | 116.0 |
| .6 | 102.5 | 103.6 | 104.7 | 105.8 | 107.0 | 108.1 | 109.3 | 110.4 | 111.6 | 112.7 | 113.9 | 115.1 |
| .8 | 101.7 | 102.8 | 103.9 | 105.0 | 106.1 | 107.3 | 108.4 | 109.6 | 110.7 | 111.9 | 113.0 | 114.2 |
| 26.0 | 100.9 | 102.0 | 103.1 | 104.2 | 105.3 | 106.4 | 107.6 | 108.7 | 109.9 | 111.0 | 112.1 | 113.3 |
| .2 | 100.1 | 101.2 | 102.3 | 103.4 | 104.5 | 105.6 | 106.8 | 107.9 | 109.0 | 110.1 | 111.3 | 112.4 |
| .4 | 99.4 | 100.4 | 101.5 | 102.6 | 103.7 | 104.8 | 106.0 | 107.1 | 108.2 | 109.3 | 110.4 | 111.6 |
| .6 | 98.6 | 99.7 | 100.7 | 101.8 | 102.9 | 104.0 | 105.2 | 106.3 | 107.4 | 108.5 | 109.6 | 110.7 |
| .8 | 97.9 | 98.9 | 100.0 | 101.1 | 102.2 | 103.3 | 104.4 | 105.5 | 106.6 | 107.7 | 108.8 | 109.9 |
| 27.0 | 97.1 | 98.2 | 99.2 | 100.3 | 101.4 | 102.5 | 103.6 | 104.7 | 105.8 | 106.9 | 108.0 | 109.1 |
| .2 | 96.4 | 97.5 | 98.5 | 99.6 | 100.7 | 101.8 | 102.8 | 103.9 | 105.0 | 106.1 | 107.2 | 108.3 |
| .4 | 95.7 | 96.8 | 97.8 | 98.9 | 99.9 | 101.0 | 102.1 | 103.2 | 104.2 | 105.3 | 106.4 | 107.5 |
| .6 | 95.0 | 96.1 | 97.1 | 98.1 | 99.2 | 100.3 | 101.3 | 102.4 | 103.5 | 104.6 | 105.6 | 106.7 |
| .8 | 94.3 | 95.4 | 96.4 | 97.4 | 98.5 | 99.6 | 100.6 | 101.7 | 102.7 | 103.8 | 104.9 | 105.9 |
| 28.0 | 93.7 | 94.7 | 95.7 | 96.7 | 97.8 | 98.8 | 99.9 | 101.0 | 102.0 | 103.1 | 104.1 | 105.2 |
| .2 | 93.0 | 94.0 | 95.0 | 96.1 | 97.1 | 98.1 | 99.2 | 100.2 | 101.3 | 102.3 | 103.4 | 104.4 |
| .4 | 92.4 | 93.4 | 94.4 | 95.4 | 96.4 | 97.5 | 98.5 | 99.5 | 100.6 | 101.6 | 102.7 | 103.7 |
| .6 | 91.7 | 92.7 | 93.7 | 94.7 | 95.7 | 96.8 | 97.8 | 98.8 | 99.9 | 100.9 | 101.9 | 103.0 |
| .8 | 91.1 | 92.1 | 93.1 | 94.1 | 95.1 | 96.1 | 97.1 | 98.2 | 99.2 | 100.2 | 101.2 | 102.3 |
| 29.0 | 90.4 | 91.4 | 92.4 | 93.4 | 94.4 | 95.4 | 96.5 | 97.5 | 98.5 | 99.5 | 100.5 | 101.6 |
| .2 | 89.8 | 90.8 | 91.8 | 92.8 | 93.8 | 94.8 | 95.8 | 96.8 | 97.8 | 98.8 | 99.9 | 100.9 |
| .4 | 89.2 | 90.2 | 91.1 | 92.1 | 93.1 | 94.1 | 95.1 | 96.1 | 97.1 | 98.2 | 99.2 | 100.2 |
| .6 | 88.6 | 89.6 | 90.5 | 91.5 | 92.5 | 93.5 | 94.5 | 95.5 | 96.5 | 97.5 | 98.5 | 99.5 |
| .8 | 88.0 | 89.0 | 89.9 | 90.9 | 91.9 | 92.9 | 93.9 | 94.9 | 95.8 | 96.8 | 97.8 | 98.8 |
| 30.0 | 87.4 | 88.4 | 89.3 | 90.3 | 91.3 | 92.3 | 93.2 | 94.2 | 95.2 | 96.2 | 97.2 | 98.2 |
| .2 | 86.8 | 87.8 | 88.7 | 89.7 | 90.7 | 91.7 | 92.6 | 93.6 | 94.6 | 95.6 | 96.5 | 97.5 |
| .4 | 86.3 | 87.2 | 88.2 | 89.1 | 90.1 | 91.1 | 92.0 | 93.0 | 94.0 | 94.9 | 95.9 | 96.9 |
| .6 | 85.7 | 86.7 | 87.6 | 88.5 | 89.5 | 90.5 | 91.4 | 92.4 | 93.3 | 94.3 | 95.3 | 96.2 |
| .8 | 85.2 | 86.1 | 87.0 | 88.0 | 88.9 | 89.9 | 90.8 | 91.8 | 92.7 | 93.7 | 94.7 | 95.6 |

TABLE 65.

## DIFFERENCE OF HEIGHT CORRESPONDING TO A CHANGE OF 1 MILLIMETER IN THE BAROMETER.

### METRIC MEASURES.

| Barometric Pressure. | MEAN TEMPERATURE OF THE AIR IN CENTIGRADE DEGREES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | −2° | 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° |
| mm. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. |
| 760 | 10.48 | 10.57 | 10.65 | 10.73 | 10.81 | 10.89 | 10.98 | 11.06 | 11.15 | 11.23 |
| 750 | 10.62 | 10.71 | 10.79 | 10.87 | 10.95 | 11.04 | 11.13 | 11.21 | 11.30 | 11.38 |
| 740 | 10.77 | 10.85 | 10.93 | 11.02 | 11.10 | 11.19 | 11.28 | 11.36 | 11.45 | 11.54 |
| 730 | 10.91 | 11.00 | 11.08 | 11.17 | 11.26 | 11.35 | 11.43 | 11.52 | 11.61 | 11.70 |
| 720 | 11.06 | 11.15 | 11.24 | 11.32 | 11.42 | 11.51 | 11.59 | 11.68 | 11.77 | 11.86 |
| 710 | 11.22 | 11.31 | 11.40 | 11.48 | 11.58 | 11.67 | 11.75 | 11.85 | 11.94 | 12.03 |
| 700 | 11.38 | 11.47 | 11.56 | 11.65 | 11.74 | 11.83 | 11.92 | 12.02 | 12.11 | 12.20 |
| 690 | 11.55 | 11.63 | 11.72 | 11.82 | 11.91 | 12.00 | 12.09 | 12.19 | 12.28 | 12.38 |
| 680 | 11.72 | 11.80 | 11.89 | 11.99 | 12.08 | 12.18 | 12.27 | 12.37 | 12.46 | 12.56 |
| 670 | 11.89 | 11.98 | 12.07 | 12.17 | 12.26 | 12.36 | 12.46 | 12.55 | 12.65 | 12.75 |
| 660 | 12.07 | 12.16 | 12.26 | 12.35 | 12.45 | 12.55 | 12.65 | 12.74 | 12.84 | 12.94 |
| 650 | 12.26 | 12.35 | 12.45 | 12.54 | 12.64 | 12.74 | 12.84 | 12.94 | 13.04 | 13.14 |
| 640 | 12.45 | 12.55 | 12.64 | 12.74 | 12.84 | 12.94 | 13.04 | 13.14 | 13.24 | 13.35 |
| 630 | 12.65 | 12.75 | 12.84 | 12.94 | 13.04 | 13.15 | 13.25 | 13.35 | 13.45 | 13.56 |
| 620 | 12.85 | 12.96 | 13.05 | 13.15 | 13.25 | 13.36 | 13.46 | 13.57 | 13.67 | 13.78 |
| 610 | 13.06 | 13.17 | 13.27 | 13.37 | 13.47 | 13.58 | 13.68 | 13.79 | 13.89 | 14.01 |
| 600 | 13.28 | 13.39 | 13.49 | 13.59 | 13.70 | 13.80 | 13.91 | 14.02 | 14.13 | 14.24 |
| 590 | 13.51 | 13.62 | 13.72 | 13.82 | 13.93 | 14.03 | 14.15 | 14.26 | 14.37 | 14.48 |
| 580 | 13.74 | 13.85 | 13.96 | 14.06 | 14.17 | 14.28 | 14.39 | 14.51 | 14.62 | 14.73 |
| 570 | 13.98 | 14.09 | 14.20 | 14.31 | 14.42 | 14.53 | 14.64 | 14.76 | 14.88 | 14.99 |
| 560 | 14.23 | 14.34 | 14.45 | 14.57 | 14.68 | 14.79 | 14.90 | 15.02 | 15.14 | 15.25 |

| Barometric Pressure. | MEAN TEMPERATURE OF THE AIR IN CENTIGRADE DEGREES. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° |
| mm. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. | Meters. |
| 760 | 11.32 | 11.41 | 11.49 | 11.58 | 11.66 | 11.75 | 11.84 | 11.92 | 12.01 | 12.10 |
| 750 | 11.47 | 11.56 | 11.64 | 11.73 | 11.82 | 11.91 | 12.00 | 12.08 | 12.17 | 12.26 |
| 740 | 11.63 | 11.72 | 11.80 | 11.89 | 11.98 | 12.07 | 12.16 | 12.24 | 12.33 | 12.42 |
| 730 | 11.79 | 11.88 | 11.96 | 12.05 | 12.15 | 12.23 | 12.32 | 12.41 | 12.50 | 12.59 |
| 720 | 11.95 | 12.04 | 12.13 | 12.22 | 12.32 | 12.40 | 12.49 | 12.58 | 12.68 | 12.77 |
| 710 | 12.12 | 12.21 | 12.30 | 12.39 | 12.49 | 12.58 | 12.67 | 12.76 | 12.86 | 12.95 |
| 700 | 12.29 | 12.39 | 12.48 | 12.57 | 12.67 | 12.76 | 12.85 | 12.94 | 13.04 | 13.13 |
| 690 | 12.47 | 12.57 | 12.66 | 12.75 | 12.85 | 12.94 | 13.04 | 13.13 | 13.23 | 13.32 |
| 680 | 12.66 | 12.75 | 12.85 | 12.94 | 13.04 | 13.13 | 13.23 | 13.32 | 13.42 | 13.52 |
| 670 | 12.85 | 12.94 | 13.04 | 13.14 | 13.23 | 13.33 | 13.43 | 13.52 | 13.62 | 13.72 |
| 660 | 13.04 | 13.14 | 13.24 | 13.34 | 13.43 | 13.53 | 13.63 | 13.73 | 13.83 | 13.93 |
| 650 | 13.24 | 13.34 | 13.44 | 13.54 | 13.64 | 13.74 | 13.84 | 13.94 | 14.04 | 14.15 |
| 640 | 13.45 | 13.55 | 13.65 | 13.75 | 13.85 | 13.96 | 14.06 | 14.15 | 14.26 | 14.37 |
| 630 | 13.66 | 13.76 | 13.87 | 13.97 | 14.07 | 14.18 | 14.28 | 14.38 | 14.49 | 14.60 |
| 620 | 13.88 | 13.98 | 14.09 | 14.20 | 14.30 | 14.41 | 14.51 | 14.62 | 14.72 | 14.83 |
| 610 | 14.11 | 14.21 | 14.32 | 14.43 | 14.54 | 14.64 | 14.75 | 14.86 | 14.96 | 15.07 |
| 600 | 14.35 | 14.45 | 14.56 | 14.67 | 14.78 | 14.89 | 15.00 | 15.11 | 15.21 | 15.32 |
| 590 | 14.59 | 14.70 | 14.81 | 14.92 | 15.03 | 15.14 | 15.25 | 15.36 | 15.47 | 15.59 |
| 580 | 14.84 | 14.95 | 15.07 | 15.17 | 15.29 | 15.40 | 15.52 | 15.63 | 15.74 | 15.86 |
| 570 | 15.10 | 15.21 | 15.33 | 15.44 | 15.56 | 15.67 | 15.79 | 15.91 | 16.02 | 16.14 |
| 560 | 15.37 | 15.48 | 15.60 | 15.72 | 15.84 | 15.95 | 16.07 | 16.19 | 16.30 | 16.42 |

## DETERMINATION OF HEIGHTS BY THE BAROMETER.

### Formula of Babinet.

$$Z = C\frac{B_0 - B}{B_0 + B}$$

$$C \text{ (in feet)} = 52494 \left[1 + \frac{t_0 + t - 64}{900}\right] \text{—English Measures.}$$

$$C \text{ (in metres)} = 16000 \left[1 + \frac{2(t_0 + t)}{1000}\right] \text{—Metric Measures.}$$

In which $Z$ = Difference of height of two stations in feet or metres.

$B_0$, $B$ = Barometric readings at the lower and upper stations respectively, corrected for all sources of instrumental error.

$t_0$, $t$ = Air temperatures at the lower and upper stations respectively.

### Values of C.

ENGLISH MEASURES.

| ½ $(t_0 + t)$. | log C. | C. |
|---|---|---|
| F. | | Feet. |
| 10° | 4.69834 | 49928 |
| 15 | .70339 | 50511 |
| 20 | .70837 | 51094 |
| 25 | .71330 | 51677 |
| 30 | .71818 | 52261 |
| 35 | 4.72300 | 52844 |
| 40 | .72777 | 53428 |
| 45 | .73248 | 54011 |
| 50 | .73715 | 54595 |
| 55 | .74177 | 55178 |
| 60 | 4.74633 | 55761 |
| 65 | .75085 | 56344 |
| 70 | .75532 | 56927 |
| 75 | .75975 | 57511 |
| 80 | .76413 | 58094 |
| 85 | 4.76847 | 58677 |
| 90 | .77276 | 59260 |
| 95 | .77702 | 59844 |
| 100 | .78123 | 60427 |

METRIC MEASURES.

| ½ $(t_0 + t)$. | log C. | C. |
|---|---|---|
| C. | | Metres. |
| −10° | 4.18639 | 15360 |
| −8 | .19000 | 15488 |
| −6 | .19357 | 15616 |
| −4 | .19712 | 15744 |
| −2 | .20063 | 15872 |
| 0 | 4.20412 | 16000 |
| +2 | .20758 | 16128 |
| 4 | .21101 | 16256 |
| 6 | .21442 | 16384 |
| 8 | .21780 | 16512 |
| 10 | 4.22115 | 16640 |
| 12 | .22448 | 16768 |
| 14 | .22778 | 16896 |
| 16 | .23106 | 17024 |
| 18 | .23431 | 17152 |
| 20 | 4.23754 | 17280 |
| 22 | .24075 | 17408 |
| 24 | .24393 | 17536 |
| 26 | .24709 | 17664 |
| 28 | .25022 | 17792 |
| 30 | 4.25334 | 17920 |
| 32 | .25643 | 18048 |
| 34 | .25950 | 18176 |
| 36 | .26255 | 18304 |

Table 67.

## BAROMETRIC PRESSURES CORRESPONDING TO THE TEMPERATURE OF THE BOILING POINT OF WATER.

### ENGLISH MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 185° | 17.075 | 17.112 | 17.150 | 17.187 | 17.224 | 17.262 | 17.300 | 17.337 | 17.375 | 17.413 |
| 186 | 17.450 | 17.488 | 17.526 | 17.564 | 17.602 | 17.641 | 17.679 | 17.717 | 17.756 | 17.794 |
| 187 | 17.832 | 17.871 | 17.910 | 17.948 | 17.987 | 18.026 | 18.065 | 18.104 | 18.143 | 18.182 |
| 188 | 18.221 | 18.261 | 18.300 | 18.340 | 18.379 | 18.419 | 18.458 | 18.498 | 18.538 | 18.578 |
| 189 | 18.618 | 18.658 | 18.698 | 18.738 | 18.778 | 18.818 | 18.859 | 18.899 | 18.940 | 18.980 |
| 190 | 19.021 | 19.062 | 19.102 | 19.143 | 19.184 | 19.225 | 19.266 | 19.308 | 19.349 | 19.390 |
| 191 | 19.431 | 19.473 | 19.514 | 19.556 | 19.598 | 19.639 | 19.681 | 19.723 | 19.765 | 19.807 |
| 192 | 19.849 | 19.892 | 19.934 | 19.976 | 20.019 | 20.061 | 20.104 | 20.146 | 20.189 | 20.232 |
| 193 | 20.275 | 20.318 | 20.361 | 20.404 | 20.447 | 20.490 | 20.533 | 20.577 | 20.620 | 20.664 |
| 194 | 20.707 | 20.751 | 20.795 | 20.839 | 20.883 | 20.927 | 20.971 | 21.015 | 21.059 | 21.103 |
| 195 | 21.148 | 21.192 | 21.237 | 21.282 | 21.326 | 21.371 | 21.416 | 21.461 | 21.506 | 21.551 |
| 196 | 21.597 | 21.642 | 21.687 | 21.733 | 21.778 | 21.824 | 21.870 | 21.915 | 21.961 | 22.007 |
| 197 | 22.053 | 22.099 | 22.145 | 22.192 | 22.238 | 22.284 | 22.331 | 22.377 | 22.424 | 22.471 |
| 198 | 22.517 | 22.564 | 22.611 | 22.658 | 22.706 | 22.753 | 22.800 | 22.847 | 22.895 | 22.942 |
| 199 | 22.990 | 23.038 | 23.085 | 23.133 | 23.181 | 23.229 | 23.277 | 23.325 | 23.374 | 23.422 |
| 200 | 23.470 | 23.519 | 23.568 | 23.616 | 23.665 | 23.714 | 23.763 | 23.812 | 23.861 | 23.910 |
| 201 | 23.959 | 24.009 | 24.058 | 24.108 | 24.157 | 24.207 | 24.257 | 24.307 | 24.357 | 24.407 |
| 202 | 24.457 | 24.507 | 24.557 | 24.608 | 24.658 | 24.709 | 24.759 | 24.810 | 24.861 | 24.912 |
| 203 | 24.963 | 25.014 | 25.065 | 25.116 | 25.168 | 25.219 | 25.271 | 25.322 | 25.374 | 25.426 |
| 204 | 25.478 | 25.530 | 25.582 | 25.634 | 25.686 | 25.738 | 25.791 | 25.843 | 25.896 | 25.948 |
| 205 | 26.001 | 26.054 | 26.107 | 26.160 | 26.213 | 26.266 | 26.319 | 26.373 | 26.426 | 26.480 |
| 206 | 26.534 | 26.587 | 26.641 | 26.695 | 26.749 | 26.803 | 26.857 | 26.912 | 26.966 | 27.021 |
| 207 | 27.075 | 27.130 | 27.184 | 27.239 | 27.294 | 27.349 | 27.404 | 27.460 | 27.515 | 27.570 |
| 208 | 27.626 | 27.681 | 27.737 | 27.793 | 27.848 | 27.904 | 27.960 | 28.016 | 28.073 | 28.129 |
| 209 | 28.185 | 28.242 | 28.298 | 28.355 | 28.412 | 28.469 | 28.526 | 28.583 | 28.640 | 28.697 |
| 210 | 28.754 | 28.812 | 28.869 | 28.927 | 28.985 | 29.042 | 29.100 | 29.158 | 29.216 | 29.275 |
| 211 | 29.333 | 29.391 | 29.450 | 29.508 | 29.567 | 29.626 | 29.685 | 29.744 | 29.803 | 29.862 |
| 212 | 29.921 | 29.981 | 30.040 | 30.100 | 30.159 | 30.219 | 30.279 | 30.339 | 30.399 | 30.459 |
| 213 | 30.519 | 30.580 | 30.640 | 30.701 | 30.761 | 30.822 | 30.883 | 30.944 | 31.005 | 31.066 |
| 214 | 31.127 | 31.199 | 31.250 | 31.311 | 31.373 | 31.435 | 31.497 | 31.559 | 31.621 | 31.683 |

Table 68.

### METRIC MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 80° | 355.40 | 356.84 | 358.28 | 359.73 | 361.19 | 362.65 | 364.11 | 365.58 | 367.06 | 368.54 |
| 81 | 370.03 | 371.52 | 373.01 | 374.51 | 376.02 | 377.53 | 379.05 | 380.57 | 382.09 | 383.62 |
| 82 | 385.16 | 386.70 | 388.25 | 389.80 | 391.36 | 392.92 | 394.49 | 396.06 | 397.64 | 399.22 |
| 83 | 400.81 | 402.40 | 404.00 | 405.61 | 407.22 | 408.83 | 410.45 | 412.08 | 413.71 | 415.35 |
| 84 | 416.99 | 418.64 | 420.29 | 421.95 | 423.61 | 425.28 | 426.95 | 428.64 | 430.32 | 432.01 |
| 85 | 433.71 | 435.41 | 437.12 | 438.83 | 440.55 | 442.28 | 444.01 | 445.75 | 447.49 | 449.24 |
| 86 | 450.99 | 452.75 | 454.51 | 456.28 | 458.06 | 459.84 | 461.63 | 463.42 | 465.22 | 467.03 |
| 87 | 468.84 | 470.66 | 472.48 | 474.31 | 476.14 | 477.99 | 479.83 | 481.68 | 483.54 | 485.41 |
| 88 | 487.28 | 489.16 | 491.04 | 492.93 | 494.82 | 496.72 | 498.63 | 500.54 | 502.46 | 504.39 |
| 89 | 506.32 | 508.26 | 510.20 | 512.15 | 514.11 | 516.07 | 518.04 | 520.01 | 521.99 | 523.98 |
| 90 | 525.97 | 527.97 | 529.98 | 531.99 | 534.01 | 536.04 | 538.07 | 540.11 | 542.15 | 544.21 |
| 91 | 546.26 | 548.33 | 550.40 | 552.48 | 554.56 | 556.65 | 558.75 | 560.85 | 562.96 | 565.08 |
| 92 | 567.20 | 569.33 | 571.47 | 573.61 | 575.76 | 577.92 | 580.08 | 582.25 | 584.43 | 586.61 |
| 93 | 588.80 | 591.00 | 593.20 | 595.41 | 597.63 | 599.86 | 602.09 | 604.33 | 606.57 | 608.82 |
| 94 | 611.08 | 613.35 | 615.62 | 617.90 | 620.19 | 622.48 | 624.79 | 627.09 | 629.41 | 631.73 |
| 95 | 634.06 | 636.40 | 638.74 | 641.09 | 643.45 | 645.82 | 648.19 | 650.57 | 652.96 | 655.35 |
| 96 | 657.75 | 660.16 | 662.58 | 665.00 | 667.43 | 669.87 | 672.32 | 674.77 | 677.23 | 679.70 |
| 97 | 682.18 | 684.66 | 687.15 | 689.65 | 692.15 | 694.67 | 697.19 | 699.71 | 702.25 | 704.79 |
| 98 | 707.35 | 709.90 | 712.47 | 715.04 | 717.63 | 720.22 | 722.81 | 725.42 | 728.03 | 730.65 |
| 99 | 733.28 | 735.92 | 738.56 | 741.21 | 743.87 | 746.54 | 749.22 | 751.90 | 754.59 | 757.29 |
| 100 | 760.00 | 762.72 | 765.44 | 768.17 | 770.91 | 773.66 | 776.42 | 779.18 | 781.95 | 784.73 |

# HYGROMETRICAL TABLES.

Pressure of aqueous vapor over ice — English measures . . . Table 69

Pressure of aqueous vapor over water — English measures . . Table 70

Pressure of aqueous vapor over ice — Metric measures . . . Table 71

Pressure of aqueous vapor over water — Metric measures . . Table 72

Weight of a cubic foot of saturated vapor — English measures Table 73

Weight of a cubic meter of saturated vapor — Metric measures Table 74

## PRESSURE OF AQUEOUS VAPOR OVER ICE.

### ENGLISH MEASURES.

| Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. |
|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | F. | Inches. | F. | Inches. | F. | Inches. | F. | Inches. |
| −60° | 0.00099 | −45° | 0.00275 | −30° | 0.00705 | −15.0° | 0.01690 | −7.5° | 0.02556 |
| 59 | .00107 | 44 | .00294 | 29 | .00749 | 14.5 | .01738 | 7.0 | .02626 |
| 58 | .00114 | 43 | .00313 | 28 | .00795 | 14.0 | .01787 | 6.5 | .02698 |
| 57 | .00123 | 42 | .00334 | 27 | .00844 | 13.5 | .01838 | 6.0 | .02771 |
| 56 | .00131 | 41 | .00356 | 26 | .00896 | 13.0 | .01890 | 5.5 | .02847 |
| −55 | .00141 | −40 | .00379 | −25 | .00951 | −12.5 | .01943 | −5.0 | .02924 |
| 54 | .00151 | 39 | .00404 | 24 | .01008 | 12.0 | .01998 | 4.5 | .03003 |
| 53 | .00161 | 38 | .00431 | 23 | .01069 | 11.5 | .02054 | 4.0 | .03084 |
| 52 | .00173 | 37 | .00458 | 22 | .01133 | 11.0 | .02111 | 3.5 | .03168 |
| 51 | .00185 | 36 | .00488 | 21 | .01201 | 10.5 | .02170 | 3.0 | .03253 |
| −50 | .00198 | −35 | .00519 | −20 | .01272 | −10.0 | .02230 | −2.5 | .03340 |
| 49 | .00211 | 34 | .00552 | 19 | .01347 | 9.5 | .02292 | 2.0 | .03429 |
| 48 | .00226 | 33 | .00588 | 18 | .01426 | 9.0 | .02356 | 1.5 | .03520 |
| 47 | .00241 | 32 | .00625 | 17 | .01510 | 8.5 | .02421 | 1.0 | .03614 |
| 46 | .00258 | 31 | .00664 | 16 | .01598 | 8.0 | .02487 | 0.5 | .03710 |

| Temperat. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 0° | 0.03809 | 0.03829 | 0.03849 | 0.03869 | 0.03890 | 0.03910 | 0.03930 | 0.03951 | 0.03971 | 0.03992 |
| 1 | .04013 | .04034 | .04055 | .04076 | .04097 | .04118 | .04140 | .04161 | .04183 | .04204 |
| 2 | .04226 | .04248 | .04270 | .04292 | .04314 | .04337 | .04359 | .04382 | .04404 | .04427 |
| 3 | .04450 | .04473 | .04496 | .04519 | .04543 | .04566 | .04590 | .04613 | .04637 | .04661 |
| 4 | .04685 | .04709 | .04733 | .04758 | .04782 | .04807 | .04831 | .04856 | .04881 | .04906 |
| 5 | .04931 | .04956 | .04982 | .05007 | .05033 | .05058 | .05084 | .05110 | .05136 | .05162 |
| 6 | .05189 | .05215 | .05242 | .05269 | .05296 | .05322 | .05350 | .05377 | .05404 | .05431 |
| 7 | .05459 | .05487 | .05514 | .05542 | .05570 | .05598 | .05627 | .05655 | .05684 | .05712 |
| 8 | .05741 | .05770 | .05799 | .05828 | .05858 | .05887 | .05917 | .05947 | .05977 | .06007 |
| 9 | .06037 | .06067 | .06098 | .06128 | .06159 | .06190 | .06221 | .06252 | .06283 | .06315 |
| 10 | .06346 | .06378 | .06410 | .06442 | .06474 | .06507 | .06539 | .06572 | .06605 | .06638 |
| 11 | .06670 | .06703 | .06737 | .06770 | .06804 | .06838 | .06872 | .06906 | .06940 | .06975 |
| 12 | .07009 | .07044 | .07079 | .07114 | .07149 | .07184 | .07220 | .07256 | .07292 | .07328 |
| 13 | .07363 | .07399 | .07436 | .07472 | .07509 | .07546 | .07583 | .07621 | .07658 | .07696 |
| 14 | .07733 | .07771 | .07809 | .07848 | .07886 | .07925 | .07964 | .08003 | .08042 | .08082 |
| 15 | .08121 | .08161 | .08201 | .08241 | .08281 | .08321 | .08362 | .08402 | .08443 | .08484 |
| 16 | .08525 | .08566 | .08608 | .08650 | .08692 | .08734 | .08777 | .08819 | .08862 | .08905 |
| 17 | .08948 | .08991 | .09035 | .09079 | .09123 | .09167 | .09211 | .09255 | .09300 | .09345 |
| 18 | .09390 | .09435 | .09481 | .09526 | .09572 | .09618 | .09664 | .09711 | .09757 | .09804 |
| 19 | .09851 | .09898 | .09946 | .09994 | .10042 | .10090 | .10138 | .10186 | .10235 | .10284 |
| 20 | .10333 | .10383 | .10432 | .10482 | .10532 | .10582 | .10633 | .10683 | .10734 | .10785 |
| 21 | .10836 | .10888 | .10940 | .10992 | .11044 | .11096 | .11149 | .11202 | .11255 | .11308 |
| 22 | .11361 | .11415 | .11469 | .11523 | .11578 | .11632 | .11687 | .11742 | .11798 | .11853 |
| 23 | .11909 | .11965 | .12022 | .12078 | .12135 | .12192 | .12250 | .12307 | .12365 | .12423 |
| 24 | .12481 | .12540 | .12598 | .12657 | .12717 | .12776 | .12836 | .12896 | .12956 | .13017 |
| 25 | .13077 | .13138 | .13200 | .13261 | .13323 | .13385 | .13447 | .13510 | .13573 | .13636 |
| 26 | .13699 | .13763 | .13827 | .13891 | .13956 | .14021 | .14086 | .14151 | .14216 | .14282 |
| 27 | .14348 | .14415 | .14481 | .14548 | .14616 | .14683 | .14751 | .14819 | .14887 | .14956 |
| 28 | .15024 | .15093 | .15163 | .15233 | .15303 | .15374 | .15444 | .15515 | .15586 | .15658 |
| 29 | .15729 | .15801 | .15874 | .15947 | .16020 | .16093 | .16167 | .16241 | .16315 | .16389 |
| 30 | .16463 | .16538 | .16614 | .16690 | .16766 | .16842 | .16919 | .16996 | .17073 | .17150 |
| 31 | .17228 | .17306 | .17386 | .17466 | .17546 | .17626 | .17707 | .17788 | .17869 | .17950 |
| 32 | .18032 | | | | | | | | | |

## PRESSURE OF AQUEOUS VAPOR OVER WATER.

### ENGLISH MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 32° | 0.1803 | 0.1810 | 0.1818 | 0.1825 | 0.1833 | 0.1840 | 0.1847 | 0.1855 | 0.1862 | 0.1870 |
| 33 | .1877 | .1885 | .1893 | .1900 | .1908 | .1915 | .1923 | .1931 | .1939 | .1946 |
| 34 | .1954 | .1962 | .1970 | .1978 | .1986 | .1994 | .2002 | .2010 | .2018 | .2026 |
| 35 | .2034 | .2042 | .2050 | .2059 | .2067 | .2075 | .2083 | .2091 | .2100 | .2108 |
| 36 | .2117 | .2125 | .2133 | .2142 | .2150 | .2159 | .2168 | .2176 | .2185 | .2193 |
| 37 | .2202 | .2211 | .2220 | .2228 | .2237 | .2246 | .2255 | .2264 | .2273 | .2282 |
| 38 | .2291 | .2300 | .2309 | .2318 | .2327 | .2336 | .2345 | .2355 | .2364 | .2373 |
| 39 | .2382 | .2392 | .2401 | .2410 | .2420 | .2429 | .2439 | .2448 | .2458 | .2467 |
| 40 | .2477 | .2487 | .2496 | .2506 | .2516 | .2526 | .2536 | .2545 | .2555 | .2565 |
| 41 | .2575 | .2585 | .2595 | .2606 | .2616 | .2626 | .2636 | .2646 | .2656 | .2667 |
| 42 | .2677 | .2687 | .2698 | .2708 | .2719 | .2729 | .2740 | .2750 | .2761 | .2771 |
| 43 | .2782 | .2793 | .2804 | .2814 | .2825 | .2836 | .2847 | .2858 | .2869 | .2880 |
| 44 | .2891 | .2902 | .2913 | .2924 | .2935 | .2946 | .2958 | .2969 | .2981 | .2992 |
| 45 | .3003 | .3014 | .3026 | .3037 | .3049 | .3061 | .3073 | .3084 | .3096 | .3108 |
| 46 | .3120 | .3132 | .3144 | .3156 | .3167 | .3179 | .3191 | .3203 | .3216 | .3228 |
| 47 | .3240 | .3252 | .3265 | .3277 | .3289 | .3301 | .3314 | .3326 | .3339 | .3352 |
| 48 | .3365 | .3377 | .3390 | .3402 | .3415 | .3428 | .3441 | .3454 | .3467 | .3480 |
| 49 | .3493 | .3506 | .3519 | .3532 | .3546 | .3559 | .3572 | .3585 | .3599 | .3612 |
| 50 | .3626 | .3639 | .3653 | .3666 | .3680 | .3694 | .3708 | .3722 | .3736 | .3749 |
| 51 | .3763 | .3777 | .3791 | .3805 | .3820 | .3834 | .3848 | .3862 | .3876 | .3890 |
| 52 | .3905 | .3919 | .3934 | .3948 | .3963 | .3978 | .3993 | .4007 | .4022 | .4037 |
| 53 | .4052 | .4067 | .4082 | .4097 | .4112 | .4127 | .4142 | .4157 | .4172 | .4187 |
| 54 | .4203 | .4218 | .4234 | .4249 | .4265 | .4280 | .4296 | .4312 | .4328 | .4343 |
| 55 | .4359 | .4375 | .4391 | .4407 | .4423 | .4439 | .4455 | .4471 | .4488 | .4504 |
| 56 | .4521 | .4537 | .4554 | .4570 | .4587 | .4603 | .4620 | .4637 | .4654 | .4670 |
| 57 | .4687 | .4704 | .4721 | .4738 | .4755 | .4772 | .4790 | .4807 | .4824 | .4841 |
| 58 | .4859 | .4876 | .4894 | .4912 | .4930 | .4947 | .4965 | .4983 | .5001 | .5019 |
| 59 | .5037 | .5055 | .5073 | .5091 | .5110 | .5128 | .5146 | .5164 | .5183 | .5201 |
| 60 | .5220 | .5239 | .5258 | .5276 | .5295 | .5314 | .5333 | .5352 | .5371 | .5390 |
| 61 | .5409 | .5428 | .5448 | .5467 | .5486 | .5505 | .5525 | .5545 | .5565 | .5584 |
| 62 | .5604 | .5624 | .5644 | .5663 | .5683 | .5703 | .5724 | .5744 | .5764 | .5784 |
| 63 | .5805 | .5825 | .5846 | .5866 | .5887 | .5908 | .5929 | .5950 | .5971 | .5992 |
| 64 | .6013 | .6034 | .6055 | .6076 | .6097 | .6118 | .6140 | .6161 | .6183 | .6204 |
| 65 | .6226 | .6248 | .6270 | .6292 | .6314 | .6336 | .6358 | .6380 | .6402 | .6424 |
| 66 | .6447 | .6469 | .6492 | .6514 | .6537 | .6559 | .6582 | .6605 | .6628 | .6651 |
| 67 | .6674 | .6697 | .6721 | .6744 | .6767 | .6790 | .6814 | .6837 | .6861 | .6885 |
| 68 | .6909 | .6932 | .6956 | .6980 | .7004 | .7028 | .7053 | .7077 | .7101 | .7125 |
| 69 | .7150 | .7174 | .7199 | .7224 | .7249 | .7274 | .7299 | .7324 | .7348 | .7373 |
| 70 | .7399 | .7424 | .7449 | .7474 | .7500 | .7526 | .7552 | .7577 | .7603 | .7629 |
| 71 | .7655 | .7681 | .7707 | .7733 | .7760 | .7786 | .7813 | .7839 | .7866 | .7892 |
| 72 | .7919 | .7946 | .7973 | .8000 | .8027 | .8054 | .8081 | .8108 | .8136 | .8163 |
| 73 | .8191 | .8219 | .8247 | .8274 | .8302 | .8330 | .8358 | .8386 | .8414 | .8442 |
| 74 | .8471 | .8499 | .8528 | .8556 | .8585 | .8614 | .8643 | .8672 | .8701 | .8730 |
| 75 | .8760 | .8789 | .8818 | .8847 | .8877 | .8907 | .8937 | .8966 | .8996 | .9026 |
| 76 | .9056 | .9086 | .9117 | .9147 | .9178 | .9208 | .9239 | .9269 | .9300 | .9331 |
| 77 | .9362 | .9393 | .9424 | .9455 | .9487 | .9518 | .9550 | .9581 | .9613 | .9645 |
| 78 | .9677 | .9709 | .9741 | .9773 | .9805 | .9837 | .9870 | .9902 | .9935 | .9968 |
| 79 | 1.0001 | 1.0033 | 1.0066 | 1.0099 | 1.0133 | 1.0166 | 1.0199 | 1.0232 | 1.0266 | 1.0300 |
| 80 | 1.0334 | 1.0367 | 1.0401 | 1.0435 | 1.0470 | 1.0504 | 1.0538 | 1.0572 | 1.0607 | 1.0641 |

# PRESSURE OF AQUEOUS VAPOR OVER WATER.

## ENGLISH MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 80° | 1.0334 | 1.0367 | 1.0401 | 1.0435 | 1.0470 | 1.0504 | 1.0538 | 1.0572 | 1.0607 | 1.0641 |
| 81 | 1.0676 | 1.0711 | 1.0746 | 1.0781 | 1.0816 | 1.0851 | 1.0887 | 1.0922 | 1.0958 | 1.0993 |
| 82 | 1.1029 | 1.1065 | 1.1101 | 1.1137 | 1.1173 | 1.1209 | 1.1246 | 1.1282 | 1.1319 | 1.1355 |
| 83 | 1.1392 | 1.1429 | 1.1466 | 1.1503 | 1.1540 | 1.1577 | 1.1615 | 1.1652 | 1.1690 | 1.1727 |
| 84 | 1.1765 | 1.1803 | 1.1841 | 1.1879 | 1.1917 | 1.1955 | 1.1994 | 1.2032 | 1.2071 | 1.2110 |
| 85 | 1.2149 | 1.2188 | 1.2227 | 1.2266 | 1.2305 | 1.2344 | 1.2384 | 1.2423 | 1.2463 | 1.2503 |
| 86 | 1.2543 | 1.2583 | 1.2623 | 1.2663 | 1.2704 | 1.2744 | 1.2785 | 1.2826 | 1.2867 | 1.2908 |
| 87 | 1.2949 | 1.2990 | 1.3031 | 1.3072 | 1.3114 | 1.3155 | 1.3197 | 1.3239 | 1.3281 | 1.3323 |
| 88 | 1.3365 | 1.3407 | 1.3450 | 1.3492 | 1.3535 | 1.3578 | 1.3621 | 1.3664 | 1.3707 | 1.3750 |
| 89 | 1.3794 | 1.3837 | 1.3881 | 1.3925 | 1.3969 | 1.4013 | 1.4057 | 1.4101 | 1.4146 | 1.4190 |
| 90 | 1.4234 | 1.4279 | 1.4324 | 1.4369 | 1.4414 | 1.4459 | 1.4505 | 1.4550 | 1.4596 | 1.4642 |
| 91 | 1.4688 | 1.4734 | 1.4780 | 1.4826 | 1.4872 | 1.4918 | 1.4965 | 1.5012 | 1.5059 | 1.5106 |
| 92 | 1.5153 | 1.5200 | 1.5247 | 1.5294 | 1.5342 | 1.5390 | 1.5438 | 1.5486 | 1.5534 | 1.5582 |
| 93 | 1.5630 | 1.5678 | 1.5727 | 1.5776 | 1.5825 | 1.5874 | 1.5923 | 1.5972 | 1.6022 | 1.6071 |
| 94 | 1.6121 | 1.6171 | 1.6221 | 1.6271 | 1.6321 | 1.6371 | 1.6422 | 1.6472 | 1.6523 | 1.6574 |
| 95 | 1.6625 | 1.6676 | 1.6728 | 1.6779 | 1.6831 | 1.6882 | 1.6934 | 1.6986 | 1.7038 | 1.7090 |
| 96 | 1.7143 | 1.7195 | 1.7248 | 1.7301 | 1.7354 | 1.7407 | 1.7460 | 1.7513 | 1.7567 | 1.7620 |
| 97 | 1.7674 | 1.7728 | 1.7782 | 1.7836 | 1.7891 | 1.7945 | 1.8000 | 1.8055 | 1.8110 | 1.8165 |
| 98 | 1.8220 | 1.8275 | 1.8331 | 1.8386 | 1.8442 | 1.8498 | 1.8554 | 1.8610 | 1.8667 | 1.8723 |
| 99 | 1.8780 | 1.8837 | 1.8894 | 1.8951 | 1.9008 | 1.9065 | 1.9123 | 1.9181 | 1.9239 | 1.9297 |
| 100 | 1.9355 | 1.9413 | 1.9472 | 1.9530 | 1.9589 | 1.9648 | 1.9707 | 1.9766 | 1.9826 | 1.9885 |
| 101 | 1.9945 | 2.0005 | 2.0065 | 2.0125 | 2.0185 | 2.0245 | 2.0306 | 2.0367 | 2.0428 | 2.0489 |
| 102 | 2.0550 | 2.0611 | 2.0673 | 2.0735 | 2.0797 | 2.0859 | 2.0921 | 2.0983 | 2.1046 | 2.1108 |
| 103 | 2.1171 | 2.1234 | 2.1298 | 2.1361 | 2.1425 | 2.1488 | 2.1552 | 2.1616 | 2.1680 | 2.1744 |
| 104 | 2.1809 | 2.1874 | 2.1939 | 2.2004 | 2.2069 | 2.2134 | 2.2200 | 2.2265 | 2.2331 | 2.2397 |
| 105 | 2.2463 | 2.2529 | 2.2596 | 2.2663 | 2.2730 | 2.2797 | 2.2864 | 2.2931 | 2.2999 | 2.3067 |
| 106 | 2.3135 | 2.3203 | 2.3271 | 2.3339 | 2.3408 | 2.3477 | 2.3546 | 2.3615 | 2.3684 | 2.3753 |
| 107 | 2.3823 | 2.3893 | 2.3963 | 2.4033 | 2.4103 | 2.4173 | 2.4244 | 2.4315 | 2.4386 | 2.4457 |
| 108 | 2.4529 | 2.4600 | 2.4672 | 2.4744 | 2.4816 | 2.4888 | 2.4961 | 2.5033 | 2.5106 | 2.5179 |
| 109 | 2.5252 | 2.5325 | 2.5399 | 2.5473 | 2.5547 | 2.5621 | 2.5695 | 2.5770 | 2.5845 | 2.5919 |
| 110 | 2.5994 | 2.6069 | 2.6145 | 2.6220 | 2.6296 | 2.6372 | 2.6448 | 2.6524 | 2.6601 | 2.6678 |
| 111 | 2.6755 | 2.6832 | 2.6909 | 2.6986 | 2.7064 | 2.7142 | 2.7220 | 2.7298 | 2.7377 | 2.7456 |
| 112 | 2.7535 | 2.7614 | 2.7693 | 2.7772 | 2.7852 | 2.7932 | 2.8012 | 2.8092 | 2.8173 | 2.8253 |
| 113 | 2.8334 | 2.8415 | 2.8496 | 2.8577 | 2.8659 | 2.8741 | 2.8823 | 2.8905 | 2.8988 | 2.9070 |
| 114 | 2.9153 | 2.9236 | 2.9320 | 2.9403 | 2.9487 | 2.9571 | 2.9655 | 2.9739 | 2.9823 | 2.9908 |
| 115 | 2.9993 | 3.0078 | 3.0163 | 3.0248 | 3.0334 | 3.0420 | 3.0506 | 3.0592 | 3.0679 | 3.0766 |
| 116 | 3.0853 | 3.0940 | 3.1027 | 3.1115 | 3.1203 | 3.1291 | 3.1379 | 3.1467 | 3.1556 | 3.1645 |
| 117 | 3.1734 | 3.1823 | 3.1913 | 3.2003 | 3.2093 | 3.2183 | 3.2273 | 3.2364 | 3.2455 | 3.2546 |
| 118 | 3.2637 | 3.2728 | 3.2820 | 3.2912 | 3.3004 | 3.3096 | 3.3189 | 3.3282 | 3.3375 | 3.3468 |
| 119 | 3.3562 | 3.3655 | 3.3749 | 3.3843 | 3.3938 | 3.4032 | 3.4127 | 3.4222 | 3.4318 | 3.4413 |
| 120 | 3.4509 | 3.4605 | 3.4701 | 3.4797 | 3.4894 | 3.4991 | 3.5088 | 3.5185 | 3.5283 | 3.5381 |
| 121 | 3.5479 | 3.5577 | 3.5676 | 3.5774 | 3.5873 | 3.5972 | 3.6072 | 3.6172 | 3.6272 | 3.6372 |
| 122 | 3.6472 | 3.6573 | 3.6674 | 3.6775 | 3.6876 | 3.6977 | 3.7079 | 3.7181 | 3.7284 | 3.7386 |
| 123 | 3.7489 | 3.7592 | 3.7695 | 3.7799 | 3.7903 | 3.8007 | 3.8111 | 3.8215 | 3.8320 | 3.8425 |
| 124 | 3.8530 | 3.8636 | 3.8742 | 3.8848 | 3.8954 | 3.9060 | 3.9167 | 3.9274 | 3.9381 | 3.9488 |
| 125 | 3.9596 | 3.9704 | 3.9813 | 3.9921 | 4.0030 | 4.0139 | 4.0248 | 4.0357 | 4.0467 | 4.0577 |
| 126 | 4.0687 | 4.0797 | 4.0908 | 4.1019 | 4.1131 | 4.1242 | 4.1354 | 4.1466 | 4.1578 | 4.1690 |
| 127 | 4.1803 | 4.1916 | 4.2030 | 4.2143 | 4.2256 | 4.2370 | 4.2485 | 4.2599 | 4.2714 | 4.2829 |
| 128 | 4.2945 | 4.3061 | 4.3177 | 4.3293 | 4.3410 | 4.3527 | 4.3645 | 4.3762 | 4.3880 | 4.3998 |
| 129 | 4.4116 | 4.4235 | 4.4354 | 4.4473 | 4.4592 | 4.4711 | 4.4831 | 4.4951 | 4.5072 | 4.5192 |
| 130 | 4.5313 | 4.5434 | 4.5555 | 4.5677 | 4.5798 | 4.5921 | 4.6043 | 4.6166 | 4.6289 | 4.6412 |

# PRESSURE OF AQUEOUS VAPOR OVER WATER.

## ENGLISH MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 130° | 4.531 | 4.543 | 4.556 | 4.568 | 4.580 | 4.592 | 4.604 | 4.617 | 4.629 | 4.641 |
| 131 | 4.654 | 4.666 | 4.678 | 4.691 | 4.703 | 4.716 | 4.728 | 4.741 | 4.754 | 4.766 |
| 132 | 4.779 | 4.792 | 4.804 | 4.817 | 4.830 | 4.843 | 4.855 | 4.868 | 4.881 | 4.894 |
| 133 | 4.907 | 4.920 | 4.933 | 4.946 | 4.959 | 4.972 | 4.985 | 4.998 | 5.012 | 5.025 |
| 134 | 5.038 | 5.051 | 5.065 | 5.078 | 5.091 | 5.105 | 5.118 | 5.132 | 5.145 | 5.158 |
| 135 | 5.172 | 5.186 | 5.199 | 5.213 | 5.226 | 5.240 | 5.254 | 5.268 | 5.281 | 5.295 |
| 136 | 5.309 | 5.323 | 5.337 | 5.351 | 5.365 | 5.379 | 5.392 | 5.407 | 5.421 | 5.435 |
| 137 | 5.449 | 5.463 | 5.477 | 5.492 | 5.506 | 5.520 | 5.535 | 5.549 | 5.563 | 5.578 |
| 138 | 5.592 | 5.607 | 5.621 | 5.636 | 5.650 | 5.665 | 5.680 | 5.694 | 5.709 | 5.724 |
| 139 | 5.739 | 5.754 | 5.768 | 5.783 | 5.798 | 5.813 | 5.828 | 5.843 | 5.858 | 5.873 |
| 140 | 5.889 | 5.904 | 5.919 | 5.934 | 5.949 | 5.965 | 5.980 | 5.995 | 6.011 | 6.026 |
| 141 | 6.041 | 6.057 | 6.072 | 6.088 | 6.104 | 6.119 | 6.135 | 6.151 | 6.166 | 6.182 |
| 142 | 6.198 | 6.214 | 6.229 | 6.245 | 6.261 | 6.277 | 6.293 | 6.309 | 6.325 | 6.341 |
| 143 | 6.358 | 6.374 | 6.390 | 6.406 | 6.422 | 6.439 | 6.455 | 6.472 | 6.488 | 6.504 |
| 144 | 6.521 | 6.537 | 6.554 | 6.571 | 6.587 | 6.604 | 6.621 | 6.637 | 6.654 | 6.671 |
| 145 | 6.688 | 6.705 | 6.722 | 6.739 | 6.756 | 6.773 | 6.790 | 6.807 | 6.824 | 6.841 |
| 146 | 6.858 | 6.876 | 6.893 | 6.910 | 6.928 | 6.945 | 6.962 | 6.980 | 6.997 | 7.015 |
| 147 | 7.032 | 7.050 | 7.068 | 7.085 | 7.103 | 7.121 | 7.139 | 7.156 | 7.174 | 7.192 |
| 148 | 7.210 | 7.228 | 7.246 | 7.264 | 7.282 | 7.300 | 7.319 | 7.337 | 7.355 | 7.374 |
| 149 | 7.392 | 7.410 | 7.429 | 7.447 | 7.466 | 7.484 | 7.503 | 7.521 | 7.540 | 7.559 |
| 150 | 7.577 | 7.596 | 7.615 | 7.634 | 7.653 | 7.672 | 7.691 | 7.710 | 7.729 | 7.748 |
| 151 | 7.767 | 7.786 | 7.805 | 7.824 | 7.844 | 7.863 | 7.882 | 7.902 | 7.921 | 7.941 |
| 152 | 7.960 | 7.980 | 8.000 | 8.019 | 8.039 | 8.059 | 8.078 | 8.098 | 8.118 | 8.138 |
| 153 | 8.158 | 8.178 | 8.198 | 8.218 | 8.238 | 8.258 | 8.278 | 8.298 | 8.319 | 8.339 |
| 154 | 8.360 | 8.380 | 8.400 | 8.421 | 8.441 | 8.462 | 8.482 | 8.503 | 8.524 | 8.545 |
| 155 | 8.565 | 8.586 | 8.607 | 8.628 | 8.649 | 8.670 | 8.691 | 8.712 | 8.733 | 8.754 |
| 156 | 8.776 | 8.797 | 8.818 | 8.839 | 8.861 | 8.882 | 8.904 | 8.925 | 8.947 | 8.968 |
| 157 | 8.990 | 9.012 | 9.034 | 9.055 | 9.077 | 9.099 | 9.121 | 9.143 | 9.165 | 9.187 |
| 158 | 9.209 | 9.231 | 9.253 | 9.276 | 9.298 | 9.320 | 9.342 | 9.365 | 9.387 | 9.410 |
| 159 | 9.432 | 9.455 | 9.478 | 9.500 | 9.523 | 9.546 | 9.569 | 9.592 | 9.615 | 9.638 |
| 160 | 9.661 | 9.684 | 9.707 | 9.730 | 9.753 | 9.776 | 9.799 | 9.823 | 9.846 | 9.870 |
| 161 | 9.893 | 9.916 | 9.940 | 9.964 | 9.987 | 10.011 | 10.035 | 10.059 | 10.082 | 10.106 |
| 162 | 10.130 | 10.154 | 10.178 | 10.203 | 10.227 | 10.251 | 10.275 | 10.299 | 10.324 | 10.348 |
| 163 | 10.373 | 10.397 | 10.422 | 10.446 | 10.471 | 10.495 | 10.520 | 10.545 | 10.570 | 10.595 |
| 164 | 10.620 | 10.645 | 10.670 | 10.695 | 10.720 | 10.745 | 10.770 | 10.795 | 10.821 | 10.846 |
| 165 | 10.872 | 10.897 | 10.922 | 10.948 | 10.974 | 10.999 | 11.025 | 11.051 | 11.077 | 11.102 |
| 166 | 11.128 | 11.154 | 11.180 | 11.206 | 11.232 | 11.258 | 11.284 | 11.311 | 11.337 | 11.363 |
| 167 | 11.390 | 11.417 | 11.444 | 11.470 | 11.497 | 11.523 | 11.550 | 11.577 | 11.604 | 11.631 |
| 168 | 11.658 | 11.685 | 11.712 | 11.739 | 11.766 | 11.793 | 11.821 | 11.848 | 11.875 | 11.903 |
| 169 | 11.930 | 11.957 | 11.985 | 12.013 | 12.040 | 12.068 | 12.096 | 12.124 | 12.152 | 12.180 |
| 170 | 12.208 | 12.236 | 12.264 | 12.292 | 12.320 | 12.349 | 12.377 | 12.406 | 12.434 | 12.463 |
| 171 | 12.491 | 12.520 | 12.548 | 12.577 | 12.606 | 12.635 | 12.664 | 12.693 | 12.722 | 12.751 |
| 172 | 12.780 | 12.809 | 12.838 | 12.868 | 12.897 | 12.927 | 12.956 | 12.986 | 13.015 | 13.045 |
| 173 | 13.074 | 13.104 | 13.134 | 13.164 | 13.194 | 13.224 | 13.254 | 13.284 | 13.314 | 13.344 |
| 174 | 13.374 | 13.405 | 13.435 | 13.465 | 13.496 | 13.527 | 13.557 | 13.588 | 13.619 | 13.649 |
| 175 | 13.680 | 13.711 | 13.742 | 13.773 | 13.804 | 13.835 | 13.867 | 13.898 | 13.929 | 13.961 |
| 176 | 13.992 | 14.024 | 14.055 | 14.087 | 14.118 | 14.150 | 14.182 | 14.214 | 14.246 | 14.278 |
| 177 | 14.310 | 14.342 | 14.374 | 14.406 | 14.438 | 14.471 | 14.503 | 14.536 | 14.568 | 14.601 |
| 178 | 14.633 | 14.666 | 14.699 | 14.731 | 14.764 | 14.797 | 14.830 | 14.864 | 14.897 | 14.930 |
| 179 | 14.963 | 14.996 | 15.030 | 15.063 | 15.097 | 15.130 | 15.164 | 15.197 | 15.231 | 15.265 |
| 180 | 15.299 | 15.333 | 15.367 | 15.401 | 15.435 | 15.469 | 15.504 | 15.538 | 15.572 | 15.607 |

TABLE 70.

# PRESSURE OF AQUEOUS VAPOR OVER WATER.

## ENGLISH MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 180° | 15.299 | 15.333 | 15.367 | 15.401 | 15.435 | 15.469 | 15.504 | 15.538 | 15.572 | 15.607 |
| 181 | 15.641 | 15.676 | 15.710 | 15.745 | 15.780 | 15.815 | 15.850 | 15.885 | 15.920 | 15.955 |
| 182 | 15.990 | 16.025 | 16.060 | 16.096 | 16.131 | 16.167 | 16.202 | 16.238 | 16.274 | 16.309 |
| 183 | 16.345 | 16.381 | 16.417 | 16.453 | 16.489 | 16.525 | 16.561 | 16.598 | 16.634 | 16.670 |
| 184 | 16.707 | 16.743 | 16.780 | 16.817 | 16.853 | 16.890 | 16.927 | 16.964 | 17.001 | 17.038 |
| 185 | 17.075 | 17.112 | 17.150 | 17.187 | 17.224 | 17.262 | 17.300 | 17.337 | 17.375 | 17.413 |
| 186 | 17.450 | 17.488 | 17.526 | 17.564 | 17.602 | 17.641 | 17.679 | 17.717 | 17.756 | 17.794 |
| 187 | 17.832 | 17.871 | 17.910 | 17.948 | 17.987 | 18.026 | 18.065 | 18.104 | 18.143 | 18.182 |
| 188 | 18.221 | 18.261 | 18.300 | 18.340 | 18.379 | 18.419 | 18.458 | 18.498 | 18.538 | 18.578 |
| 189 | 18.618 | 18.658 | 18.698 | 18.738 | 18.778 | 18.818 | 18.859 | 18.899 | 18.940 | 18.980 |
| 190 | 19.021 | 19.062 | 19.102 | 19.143 | 19.184 | 19.225 | 19.266 | 19.308 | 19.349 | 19.390 |
| 191 | 19.431 | 19.473 | 19.514 | 19.556 | 19.598 | 19.639 | 19.681 | 19.723 | 19.765 | 19.807 |
| 192 | 19.849 | 19.892 | 19.934 | 19.976 | 20.019 | 20.061 | 20.104 | 20.146 | 20.189 | 20.232 |
| 193 | 20.275 | 20.318 | 20.361 | 20.404 | 20.447 | 20.490 | 20.533 | 20.577 | 20.620 | 20.664 |
| 194 | 20.707 | 20.751 | 20.795 | 20.839 | 20.883 | 20.927 | 20.971 | 21.015 | 21.059 | 21.103 |
| 195 | 21.148 | 21.192 | 21.237 | 21.282 | 21.326 | 21.371 | 21.416 | 21.461 | 21.506 | 21.551 |
| 196 | 21.597 | 21.642 | 21.687 | 21.733 | 21.778 | 21.824 | 21.870 | 21.915 | 21.961 | 22.007 |
| 197 | 22.053 | 22.099 | 22.145 | 22.192 | 22.238 | 22.284 | 22.331 | 22.377 | 22.424 | 22.471 |
| 198 | 22.517 | 22.564 | 22.611 | 22.658 | 22.706 | 22.753 | 22.800 | 22.847 | 22.895 | 22.942 |
| 199 | 22.990 | 23.038 | 23.085 | 23.133 | 23.181 | 23.229 | 23.277 | 23.325 | 23.374 | 23.422 |
| 200 | 23.470 | 23.519 | 23.568 | 23.616 | 23.665 | 23.714 | 23.763 | 23.812 | 23.861 | 23.910 |
| 201 | 23.959 | 24.009 | 24.058 | 24.108 | 24.157 | 24.207 | 24.257 | 24.307 | 24.357 | 24.407 |
| 202 | 24.457 | 24.507 | 24.557 | 24.608 | 24.658 | 24.709 | 24.759 | 24.810 | 24.861 | 24.912 |
| 203 | 24.963 | 25.014 | 25.065 | 25.116 | 25.168 | 25.219 | 25.271 | 25.322 | 25.374 | 25.426 |
| 204 | 25.478 | 25.530 | 25.582 | 25.634 | 25.686 | 25.738 | 25.791 | 25.843 | 25.896 | 25.948 |
| 205 | 26.001 | 26.054 | 26.107 | 26.160 | 26.213 | 26.266 | 26.319 | 26.373 | 26.426 | 26.480 |
| 206 | 26.534 | 26.587 | 26.641 | 26.695 | 26.749 | 26.803 | 26.857 | 26.912 | 26.966 | 27.021 |
| 207 | 27.075 | 27.130 | 27.184 | 27.239 | 27.294 | 27.349 | 27.404 | 27.460 | 27.515 | 27.570 |
| 208 | 27.626 | 27.681 | 27.737 | 27.793 | 27.848 | 27.904 | 27.960 | 28.016 | 28.073 | 28.129 |
| 209 | 28.185 | 28.242 | 28.298 | 28.355 | 28.412 | 28.469 | 28.526 | 28.583 | 28.640 | 28.697 |
| 210 | 28.754 | 28.812 | 28.869 | 28.927 | 28.985 | 29.042 | 29.100 | 29.158 | 29.216 | 29.275 |
| 211 | 29.333 | 29.391 | 29.450 | 29.508 | 29.567 | 29.626 | 29.685 | 29.744 | 29.803 | 29.862 |
| 212 | 29.921 | 29.981 | 30.040 | 30.100 | 30.159 | 30.219 | 30.279 | 30.339 | 30.399 | 30.459 |
| 213 | 30.519 | 30.580 | 30.640 | 30.701 | 30.761 | 30.822 | 30.883 | 30.944 | 31.005 | 31.066 |
| 214 | 31.127 | 31.189 | 31.250 | 31.311 | 31.373 | 31.435 | 31.497 | 31.559 | 31.621 | 31.683 |

## PRESSURE OF AQUEOUS VAPOR OVER ICE.

### METRIC MEASURES.

| Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. | Temperature. | Vapor Pressure. |
|---|---|---|---|---|---|---|---|---|---|
| C. | mm. | C. | mm. | C. | mm. | C. | mm. | C. | mm. |
| −70° | 0.0018 | −60° | 0.0078 | −50.0° | 0.0291 | −45.0° | 0.0537 | −40.0° | 0.0964 |
| 69 | 0.0021 | 59 | 0.0089 | 49.5 | 0.0308 | 44.5 | 0.0570 | 39.5 | 0.1020 |
| 68 | 0.0025 | 58 | 0.0102 | 49.0 | 0.0329 | 44.0 | 0.0605 | 39.0 | 0.1080 |
| 67 | 0.0028 | 57 | 0.0117 | 48.5 | 0.0350 | 43.5 | 0.0642 | 38.5 | 0.1143 |
| 66 | 0.0033 | 56 | 0.0134 | 48.0 | 0.0373 | 43.0 | 0.0680 | 38.0 | 0.1209 |
| −65 | 0.0038 | −55 | 0.0153 | −47.5 | 0.0396 | −42.5 | 0.0721 | −37.5 | 0.1279 |
| 64 | 0.0044 | 54 | 0.0174 | 47.0 | 0.0421 | 42.0 | 0.0765 | 37.0 | 0.1352 |
| 63 | 0.0051 | 53 | 0.0198 | 46.5 | 0.0448 | 41.5 | 0.0811 | 36.5 | 0.1430 |
| 62 | 0.0059 | 52 | 0.0226 | 46.0 | 0.0476 | 41.0 | 0.0859 | 36.0 | 0.1511 |
| 61 | 0.0068 | 51 | 0.0256 | 45.5 | 0.0506 | 40.5 | 0.0910 | 35.5 | 0.1596 |

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −35° | 0.1686 | 0.1668 | 0.1650 | 0.1632 | 0.1614 | 0.1596 | 0.1579 | 0.1562 | 0.1545 | 0.1528 |
| 34 | 0.1880 | 0.1860 | 0.1840 | 0.1820 | 0.1800 | 0.1781 | 0.1761 | 0.1742 | 0.1723 | 0.1705 |
| 33 | 0.2094 | 0.2072 | 0.2050 | 0.2028 | 0.2006 | 0.1984 | 0.1963 | 0.1942 | 0.1921 | 0.1901 |
| 32 | 0.2331 | 0.2306 | 0.2281 | 0.2257 | 0.2233 | 0.2209 | 0.2186 | 0.2163 | 0.2140 | 0.2117 |
| 31 | 0.2591 | 0.2564 | 0.2537 | 0.2510 | 0.2484 | 0.2458 | 0.2432 | 0.2406 | 0.2381 | 0.2355 |
| −30 | 0.2878 | 0.2848 | 0.2818 | 0.2789 | 0.2760 | 0.2731 | 0.2703 | 0.2674 | 0.2646 | 0.2619 |
| 29 | 0.3194 | 0.3161 | 0.3128 | 0.3096 | 0.3064 | 0.3032 | 0.3001 | 0.2970 | 0.2939 | 0.2908 |
| 28 | 0.3541 | 0.3505 | 0.3469 | 0.3433 | 0.3398 | 0.3363 | 0.3329 | 0.3295 | 0.3261 | 0.3227 |
| 27 | 0.3923 | 0.3883 | 0.3843 | 0.3804 | 0.3766 | 0.3727 | 0.3689 | 0.3652 | 0.3615 | 0.3578 |
| 26 | 0.4341 | 0.4297 | 0.4254 | 0.4211 | 0.4169 | 0.4127 | 0.4085 | 0.4044 | 0.4003 | 0.3963 |
| −25 | 0.4800 | 0.4752 | 0.4705 | 0.4658 | 0.4611 | 0.4565 | 0.4519 | 0.4474 | 0.4429 | 0.4385 |
| 24 | 0.5303 | 0.5251 | 0.5199 | 0.5147 | 0.5096 | 0.5046 | 0.4996 | 0.4946 | 0.4897 | 0.4848 |
| 23 | 0.5854 | 0.5796 | 0.5739 | 0.5683 | 0.5628 | 0.5572 | 0.5517 | 0.5463 | 0.5409 | 0.5356 |
| 22 | 0.6456 | 0.6393 | 0.6331 | 0.6270 | 0.6209 | 0.6148 | 0.6088 | 0.6029 | 0.5970 | 0.5912 |
| 21 | 0.7115 | 0.7046 | 0.6978 | 0.6911 | 0.6844 | 0.6778 | 0.6713 | 0.6648 | 0.6583 | 0.6519 |
| −20 | 0.7834 | 0.7759 | 0.7685 | 0.7611 | 0.7538 | 0.7466 | 0.7395 | 0.7324 | 0.7254 | 0.7184 |
| 19 | 0.8618 | 0.8537 | 0.8456 | 0.8376 | 0.8296 | 0.8217 | 0.8139 | 0.8062 | 0.7985 | 0.7909 |
| 18 | 0.9474 | 0.9385 | 0.9297 | 0.9209 | 0.9123 | 0.9037 | 0.8952 | 0.8867 | 0.8784 | 0.8701 |
| 17 | 1.0406 | 1.0309 | 1.0213 | 1.0118 | 1.0024 | 0.9930 | 0.9837 | 0.9745 | 0.9654 | 0.9563 |
| 16 | 1.1421 | 1.1316 | 1.1211 | 1.1108 | 1.1005 | 1.0903 | 1.0802 | 1.0702 | 1.0602 | 1.0504 |
| −15 | 1.2525 | 1.2411 | 1.2297 | 1.2184 | 1.2072 | 1.1962 | 1.1852 | 1.1743 | 1.1635 | 1.1527 |
| 14 | 1.3726 | 1.3601 | 1.3477 | 1.3355 | 1.3233 | 1.3113 | 1.2993 | 1.2875 | 1.2757 | 1.2641 |
| 13 | 1.5029 | 1.4894 | 1.4759 | 1.4626 | 1.4495 | 1.4364 | 1.4234 | 1.4105 | 1.3978 | 1.3851 |
| 12 | 1.6444 | 1.6297 | 1.6151 | 1.6007 | 1.5864 | 1.5722 | 1.5581 | 1.5441 | 1.5302 | 1.5165 |
| 11 | 1.7979 | 1.7820 | 1.7662 | 1.7506 | 1.7350 | 1.7196 | 1.7043 | 1.6892 | 1.6741 | 1.6592 |
| −10 | 1.9643 | 1.9470 | 1.9299 | 1.9129 | 1.8961 | 1.8794 | 1.8628 | 1.8464 | 1.8301 | 1.8139 |
| 9 | 2.1445 | 2.1258 | 2.1073 | 2.0889 | 2.0707 | 2.0526 | 2.0347 | 2.0168 | 1.9992 | 1.9817 |
| 8 | 2.3395 | 2.3193 | 2.2993 | 2.2794 | 2.2596 | 2.2401 | 2.2206 | 2.2014 | 2.1823 | 2.1633 |
| 7 | 2.5505 | 2.5287 | 2.5070 | 2.4855 | 2.4642 | 2.4430 | 2.4220 | 2.4011 | 2.3804 | 2.3599 |
| 6 | 2.7785 | 2.7549 | 2.7315 | 2.7083 | 2.6852 | 2.6623 | 2.6396 | 2.6171 | 2.5947 | 2.5725 |
| − 5 | 3.0248 | 2.9993 | 2.9740 | 2.9489 | 2.9240 | 2.8993 | 2.8747 | 2.8504 | 2.8262 | 2.8023 |
| 4 | 3.2907 | 3.2632 | 3.2359 | 3.2088 | 3.1819 | 3.1552 | 3.1287 | 3.1025 | 3.0764 | 3.0505 |
| 3 | 3.5775 | 3.5479 | 3.5184 | 3.4892 | 3.4602 | 3.4314 | 3.4028 | 3.3745 | 3.3463 | 3.3184 |
| 2 | 3.8868 | 3.8548 | 3.8230 | 3.7916 | 3.7603 | 3.7292 | 3.6985 | 3.6678 | 3.6375 | 3.6074 |
| 1 | 4.2199 | 4.1854 | 4.1513 | 4.1174 | 4.0837 | 4.0502 | 4.0171 | 3.9841 | 3.9515 | 3.9190 |
| − 0 | 4.5802 | 4.5428 | 4.5057 | 4.4690 | 4.4325 | 4.3962 | 4.3604 | 4.3248 | 4.2896 | 4.2546 |

## PRESSURE OF AQUEOUS VAPOR OVER WATER.

### METRIC MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 0° | 4.580 | 4.614 | 4.647 | 4.681 | 4.715 | 4.750 | 4.784 | 4.819 | 4.854 | 4.889 |
| 1 | 4.924 | 4.960 | 4.996 | 5.032 | 5.068 | 5.105 | 5.142 | 5.179 | 5.216 | 5.254 |
| 2 | 5.291 | 5.329 | 5.368 | 5.406 | 5.445 | 5.484 | 5.523 | 5.562 | 5.602 | 5.642 |
| 3 | 5.682 | 5.723 | 5.763 | 5.804 | 5.846 | 5.887 | 5.929 | 5.971 | 6.013 | 6.056 |
| 4 | 6.098 | 6.141 | 6.185 | 6.228 | 6.272 | 6.316 | 6.361 | 6.406 | 6.450 | 6.496 |
| 5 | 6.541 | 6.587 | 6.633 | 6.680 | 6.726 | 6.773 | 6.820 | 6.868 | 6.916 | 6.964 |
| 6 | 7.012 | 7.061 | 7.110 | 7.159 | 7.209 | 7.259 | 7.309 | 7.360 | 7.410 | 7.462 |
| 7 | 7.513 | 7.565 | 7.617 | 7.669 | 7.722 | 7.775 | 7.828 | 7.882 | 7.936 | 7.991 |
| 8 | 8.045 | 8.100 | 8.156 | 8.211 | 8.267 | 8.324 | 8.380 | 8.437 | 8.494 | 8.552 |
| 9 | 8.610 | 8.669 | 8.727 | 8.786 | 8.846 | 8.906 | 8.966 | 9.026 | 9.087 | 9.148 |
| 10 | 9.210 | 9.272 | 9.334 | 9.397 | 9.460 | 9.523 | 9.587 | 9.651 | 9.716 | 9.781 |
| 11 | 9.846 | 9.912 | 9.978 | 10.044 | 10.111 | 10.178 | 10.246 | 10.314 | 10.382 | 10.451 |
| 12 | 10.521 | 10.590 | 10.660 | 10.731 | 10.801 | 10.873 | 10.944 | 11.016 | 11.089 | 11.162 |
| 13 | 11.235 | 11.309 | 11.383 | 11.458 | 11.533 | 11.608 | 11.684 | 11.761 | 11.837 | 11.915 |
| 14 | 11.992 | 12.070 | 12.149 | 12.228 | 12.307 | 12.387 | 12.468 | 12.549 | 12.630 | 12.712 |
| 15 | 12.794 | 12.877 | 12.960 | 13.043 | 13.127 | 13.212 | 13.297 | 13.383 | 13.469 | 13.555 |
| 16 | 13.642 | 13.729 | 13.817 | 13.906 | 13.995 | 14.084 | 14.174 | 14.265 | 14.356 | 14.447 |
| 17 | 14.539 | 14.632 | 14.725 | 14.818 | 14.912 | 15.007 | 15.102 | 15.197 | 15.293 | 15.390 |
| 18 | 15.487 | 15.585 | 15.683 | 15.782 | 15.882 | 15.981 | 16.082 | 16.183 | 16.285 | 16.387 |
| 19 | 16.489 | 16.593 | 16.696 | 16.801 | 16.906 | 17.011 | 17.117 | 17.224 | 17.331 | 17.439 |
| 20 | 17.548 | 17.657 | 17.766 | 17.877 | 17.987 | 18.099 | 18.211 | 18.323 | 18.437 | 18.551 |
| 21 | 18.665 | 18.780 | 18.896 | 19.012 | 19.129 | 19.247 | 19.365 | 19.484 | 19.603 | 19.723 |
| 22 | 19.844 | 19.965 | 20.087 | 20.210 | 20.333 | 20.457 | 20.582 | 20.707 | 20.833 | 20.960 |
| 23 | 21.087 | 21.215 | 21.344 | 21.473 | 21.604 | 21.734 | 21.866 | 21.998 | 22.131 | 22.264 |
| 24 | 22.398 | 22.533 | 22.669 | 22.805 | 22.942 | 23.080 | 23.219 | 23.358 | 23.498 | 23.638 |
| 25 | 23.780 | 23.922 | 24.065 | 24.209 | 24.353 | 24.498 | 24.644 | 24.791 | 24.938 | 25.086 |
| 26 | 25.235 | 25.385 | 25.535 | 25.687 | 25.839 | 25.991 | 26.145 | 26.299 | 26.455 | 26.610 |
| 27 | 26.767 | 26.925 | 27.083 | 27.242 | 27.402 | 27.563 | 27.725 | 27.887 | 28.051 | 28.215 |
| 28 | 28.380 | 28.546 | 28.712 | 28.880 | 29.048 | 29.217 | 29.387 | 29.558 | 29.730 | 29.903 |
| 29 | 30.076 | 30.251 | 30.426 | 30.602 | 30.779 | 30.957 | 31.136 | 31.315 | 31.496 | 31.678 |
| 30 | 31.860 | 32.043 | 32.228 | 32.413 | 32.599 | 32.786 | 32.974 | 33.163 | 33.353 | 33.543 |
| 31 | 33.735 | 33.928 | 34.121 | 34.316 | 34.512 | 34.708 | 34.906 | 35.104 | 35.303 | 35.504 |
| 32 | 35.705 | 35.908 | 36.111 | 36.315 | 36.521 | 36.727 | 36.935 | 37.143 | 37.353 | 37.563 |
| 33 | 37.775 | 37.987 | 38.201 | 38.415 | 38.631 | 38.848 | 39.065 | 39.284 | 39.504 | 39.725 |
| 34 | 39.947 | 40.170 | 40.394 | 40.619 | 40.846 | 41.073 | 41.302 | 41.531 | 41.762 | 41.994 |
| 35 | 42.227 | 42.461 | 42.696 | 42.932 | 43.170 | 43.408 | 43.648 | 43.889 | 44.131 | 44.374 |
| 36 | 44.619 | 44.864 | 45.111 | 45.358 | 45.608 | 45.858 | 46.109 | 46.362 | 46.615 | 46.870 |
| 37 | 47.127 | 47.384 | 47.643 | 47.902 | 48.163 | 48.426 | 48.689 | 48.954 | 49.220 | 49.487 |
| 38 | 49.756 | 50.025 | 50.296 | 50.569 | 50.842 | 51.117 | 51.393 | 51.670 | 51.949 | 52.229 |
| 39 | 52.510 | 52.793 | 53.077 | 53.362 | 53.649 | 53.937 | 54.226 | 54.516 | 54.808 | 55.101 |
| 40 | 55.396 | 55.692 | 55.989 | 56.288 | 56.588 | 56.889 | 57.192 | 57.496 | 57.802 | 58.109 |
| 41 | 58.417 | 58.727 | 59.038 | 59.351 | 59.665 | 59.981 | 60.298 | 60.616 | 60.936 | 61.257 |
| 42 | 61.580 | 61.904 | 62.230 | 62.557 | 62.886 | 63.216 | 63.547 | 63.880 | 64.215 | 64.551 |
| 43 | 64.889 | 65.228 | 65.569 | 65.911 | 66.255 | 66.600 | 66.947 | 67.295 | 67.645 | 67.997 |
| 44 | 68.350 | 68.704 | 69.061 | 69.419 | 69.778 | 70.139 | 70.502 | 70.866 | 71.232 | 71.599 |
| 45 | 71.968 | 72.339 | 72.712 | 73.086 | 73.461 | 73.839 | 74.218 | 74.598 | 74.981 | 75.365 |
| 46 | 75.751 | 76.138 | 76.527 | 76.918 | 77.311 | 77.705 | 78.101 | 78.499 | 78.898 | 79.300 |
| 47 | 79.703 | 80.107 | 80.514 | 80.922 | 81.332 | 81.744 | 82.158 | 82.573 | 82.990 | 83.409 |
| 48 | 83.830 | 84.253 | 84.677 | 85.104 | 85.532 | 85.962 | 86.394 | 86.828 | 87.263 | 87.701 |
| 49 | 88.140 | 88.581 | 89.024 | 89.470 | 89.916 | 90.365 | 90.816 | 91.269 | 91.723 | 92.180 |
| 50 | 92.639 | 93.099 | 93.562 | 94.026 | 94.492 | 94.961 | 95.431 | 95.903 | 96.378 | 96.854 |

## PRESSURE OF AQUEOUS VAPOR OVER WATER.

### METRIC MEASURES.

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 50° | 92.64 | 93.10 | 93.56 | 94.03 | 94.49 | 94.96 | 95.43 | 95.90 | 96.38 | 96.85 |
| 51 | 97.33 | 97.81 | 98.30 | 98.78 | 99.27 | 99.76 | 100.25 | 100.74 | 101.23 | 101.73 |
| 52 | 102.23 | 102.73 | 103.23 | 103.74 | 104.25 | 104.75 | 105.27 | 105.78 | 106.30 | 106.81 |
| 53 | 107.33 | 107.86 | 108.38 | 108.91 | 109.44 | 109.97 | 110.50 | 111.04 | 111.57 | 112.11 |
| 54 | 112.66 | 113.20 | 113.75 | 114.30 | 114.85 | 115.40 | 115.96 | 116.51 | 117.07 | 117.64 |
| 55 | 118.20 | 118.77 | 119.34 | 119.91 | 120.49 | 121.06 | 121.64 | 122.22 | 122.81 | 123.39 |
| 56 | 123.98 | 124.57 | 125.16 | 125.76 | 126.36 | 126.96 | 127.56 | 128.17 | 128.77 | 129.38 |
| 57 | 130.00 | 130.61 | 131.23 | 131.85 | 132.47 | 133.10 | 133.73 | 134.36 | 134.99 | 135.62 |
| 58 | 136.26 | 136.90 | 137.54 | 138.19 | 138.84 | 139.49 | 140.14 | 140.80 | 141.46 | 142.12 |
| 59 | 142.78 | 143.45 | 144.12 | 144.79 | 145.46 | 146.14 | 146.82 | 147.50 | 148.19 | 148.88 |
| 60 | 149.57 | 150.26 | 150.95 | 151.65 | 152.35 | 153.06 | 153.77 | 154.48 | 155.19 | 155.90 |
| 61 | 156.62 | 157.34 | 158.07 | 158.79 | 159.52 | 160.26 | 160.99 | 161.73 | 162.47 | 163.21 |
| 62 | 163.96 | 164.71 | 165.46 | 166.22 | 166.98 | 167.74 | 168.50 | 169.27 | 170.04 | 170.81 |
| 63 | 171.59 | 172.37 | 173.15 | 173.93 | 174.72 | 175.51 | 176.31 | 177.10 | 177.91 | 178.71 |
| 64 | 179.52 | 180.32 | 181.14 | 181.95 | 182.77 | 183.59 | 184.42 | 185.25 | 186.08 | 186.91 |
| 65 | 187.75 | 188.59 | 189.44 | 190.28 | 191.13 | 191.99 | 192.85 | 193.71 | 194.57 | 195.44 |
| 66 | 196.31 | 197.18 | 198.06 | 198.94 | 199.82 | 200.71 | 201.60 | 202.49 | 203.39 | 204.29 |
| 67 | 205.19 | 206.10 | 207.01 | 207.92 | 208.84 | 209.76 | 210.68 | 211.61 | 212.54 | 213.47 |
| 68 | 214.41 | 215.35 | 216.30 | 217.24 | 218.20 | 219.15 | 220.11 | 221.07 | 222.04 | 223.01 |
| 69 | 223.98 | 224.96 | 225.94 | 226.92 | 227.91 | 228.90 | 229.89 | 230.89 | 231.89 | 232.90 |
| 70 | 233.91 | 234.92 | 235.94 | 236.96 | 237.98 | 239.01 | 240.04 | 241.08 | 242.12 | 243.16 |
| 71 | 244.21 | 245.26 | 246.31 | 247.37 | 248.43 | 249.50 | 250.57 | 251.64 | 252.72 | 253.80 |
| 72 | 254.88 | 255.97 | 257.07 | 258.16 | 259.27 | 260.37 | 261.48 | 262.59 | 263.71 | 264.83 |
| 73 | 265.96 | 267.08 | 268.22 | 269.35 | 270.50 | 271.64 | 272.79 | 273.94 | 275.10 | 276.26 |
| 74 | 277.43 | 278.60 | 279.77 | 280.95 | 282.13 | 283.32 | 284.51 | 285.71 | 286.90 | 288.11 |
| 75 | 289.32 | 290.53 | 291.74 | 292.97 | 294.19 | 295.42 | 296.65 | 297.89 | 299.13 | 300.38 |
| 76 | 301.63 | 302.89 | 304.15 | 305.41 | 306.68 | 307.95 | 309.23 | 310.51 | 311.80 | 313.09 |
| 77 | 314.38 | 315.68 | 316.99 | 318.30 | 319.61 | 320.93 | 322.25 | 323.58 | 324.91 | 326.25 |
| 78 | 327.59 | 328.93 | 330.28 | 331.64 | 333.00 | 334.36 | 335.73 | 337.10 | 338.48 | 339.86 |
| 79 | 341.25 | 342.65 | 344.04 | 345.44 | 346.85 | 348.26 | 349.68 | 351.10 | 352.53 | 353.96 |
| 80 | 355.40 | 356.84 | 358.28 | 359.73 | 361.19 | 362.65 | 364.11 | 365.58 | 367.06 | 368.54 |
| 81 | 370.03 | 371.52 | 373.01 | 374.51 | 376.02 | 377.53 | 379.05 | 380.57 | 382.09 | 383.62 |
| 82 | 385.16 | 386.70 | 388.25 | 389.80 | 391.36 | 392.92 | 394.49 | 396.06 | 397.64 | 399.22 |
| 83 | 400.81 | 402.40 | 404.00 | 405.61 | 407.22 | 408.83 | 410.45 | 412.08 | 413.71 | 415.35 |
| 84 | 416.99 | 418.64 | 420.29 | 421.95 | 423.61 | 425.28 | 426.95 | 428.64 | 430.32 | 432.01 |
| 85 | 433.71 | 435.41 | 437.12 | 438.83 | 440.55 | 442.28 | 444.01 | 445.75 | 447.49 | 449.24 |
| 86 | 450.99 | 452.75 | 454.51 | 456.28 | 458.06 | 459.84 | 461.63 | 463.42 | 465.22 | 467.03 |
| 87 | 468.84 | 470.66 | 472.48 | 474.31 | 476.14 | 477.99 | 479.83 | 481.68 | 483.54 | 485.41 |
| 88 | 487.28 | 489.16 | 491.04 | 492.93 | 494.82 | 496.72 | 498.63 | 500.54 | 502.46 | 504.39 |
| 89 | 506.32 | 508.26 | 510.20 | 512.15 | 514.11 | 516.07 | 518.04 | 520.01 | 521.99 | 523.98 |
| 90 | 525.97 | 527.97 | 529.98 | 531.99 | 534.01 | 536.04 | 538.07 | 540.11 | 542.15 | 544.21 |
| 91 | 546.26 | 548.33 | 550.40 | 552.48 | 554.56 | 556.65 | 558.75 | 560.85 | 562.96 | 565.08 |
| 92 | 567.20 | 569.33 | 571.47 | 573.61 | 575.76 | 577.92 | 580.08 | 582.25 | 584.43 | 586.61 |
| 93 | 588.80 | 591.00 | 593.20 | 595.41 | 597.63 | 599.86 | 602.09 | 604.33 | 606.57 | 608.82 |
| 94 | 611.08 | 613.35 | 615.62 | 617.90 | 620.19 | 622.48 | 624.79 | 627.09 | 629.41 | 631.73 |
| 95 | 634.06 | 636.40 | 638.74 | 641.09 | 643.45 | 645.82 | 648.19 | 650.57 | 652.96 | 655.35 |
| 96 | 657.75 | 660.16 | 662.58 | 665.00 | 667.43 | 669.87 | 672.32 | 674.77 | 677.23 | 679.70 |
| 97 | 682.18 | 684.66 | 687.15 | 689.65 | 692.15 | 694.67 | 697.19 | 699.71 | 702.25 | 704.79 |
| 98 | 707.35 | 709.90 | 712.47 | 715.04 | 717.63 | 720.22 | 722.81 | 725.42 | 728.03 | 730.65 |
| 99 | 733.28 | 735.92 | 738.56 | 741.21 | 743.87 | 746.54 | 749.22 | 751.90 | 754.59 | 757.29 |
| 100 | 760.00 | 762.72 | 765.44 | 768.17 | 770.91 | 773.66 | 776.42 | 779.18 | 781.95 | 784.73 |

## PRESSURE OF AQUEOUS VAPOR OVER WATER.

### METRIC MEASURES.

| Temperature. | 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| 100° | 760.0 | 787.5 | 815.9 | 845.0 | 875.1 | 906.0 | 937.8 | 970.5 | 1004.2 | 1038.8 |
| 110 | 1074.4 | 1111.0 | 1148.6 | 1187.2 | 1226.9 | 1267.7 | 1309.6 | 1352.6 | 1396.8 | 1442.1 |
| 120 | 1488.7 | 1536.4 | 1585.4 | 1635.7 | 1687.3 | 1740.2 | 1794.4 | 1850.0 | 1907.0 | 1965.4 |
| 130 | 2025.2 | 2086.5 | 2149.3 | 2213.7 | 2279.6 | 2347.0 | 2416.1 | 2486.8 | 2559.2 | 2633.2 |
| 140 | 2709.0 | 2786.5 | 2865.8 | 2947.0 | 3029.9 | 3114.7 | 3201.4 | 3290.1 | 3380.7 | 3473.3 |
| 150° | 3567.9 | 3664.6 | 3763.3 | 3864.2 | 3967.2 | 4072.4 | 4179.8 | 4289.5 | 4401.5 | 4515.7 |
| 160 | 4632.4 | 4751.4 | 4872.8 | 4996.7 | 5123.1 | 5252.0 | 5383.4 | 5517.5 | 5654.2 | 5793.5 |
| 170 | 5935.6 | 6080.4 | 6228.0 | 6378.4 | 6531.7 | 6687.8 | 6846.9 | 7009.0 | 7174.0 | 7342.1 |
| 180 | 7513.3 | 7687.7 | 7865.2 | 8045.9 | 8229.8 | 8417.0 | 8607.6 | 8801.5 | 8998.9 | 9199.6 |
| 190° | 9404 | 9612 | 9823 | 10038 | 10257 | 10479 | 10705 | 10935 | 11169 | 11407 |
| 200 | 11648 | 11894 | 12143 | 12397 | 12654 | 12916 | 13182 | 13452 | 13727 | 14006 |
| 210 | 14289 | 14577 | 14869 | 15165 | 15467 | 15772 | 16083 | 16398 | 16718 | 17043 |
| 220 | 17372 | 17707 | 18046 | 18391 | 18740 | 19095 | 19454 | 19819 | 20190 | 20565 |
| 230° | 20946 | 21332 | 21724 | 22121 | 22524 | 22932 | 23347 | 23766 | 24192 | 24623 |
| 240 | 25061 | 25504 | 25953 | 26408 | 26870 | 27337 | 27811 | 28291 | 28778 | 29270 |
| 250 | 29770 | 30275 | 30787 | 31306 | 31832 | 32364 | 32903 | 33449 | 34002 | 34562 |
| 260 | 35128 | 35702 | 36283 | 36872 | 37467 | 38070 | 38680 | 39298 | 39923 | 40556 |
| 270 | 41197 | 41845 | 42501 | 43165 | 43836 | 44516 | 45204 | 45899 | 46603 | 47316 |
| 280° | 48036 | 48765 | 49503 | 50248 | 51003 | 51766 | 52538 | 53318 | 54108 | 54906 |
| 290 | 55714 | 56530 | 57356 | 58191 | 59035 | 59888 | 60751 | 61624 | 62506 | 63398 |
| 300 | 64299 | 65211 | 66132 | 67063 | 68005 | 68956 | 69918 | 70890 | 71872 | 72865 |
| 310 | 73869 | 74883 | 75907 | 76943 | 77990 | 79047 | 80116 | 81195 | 82286 | 83389 |
| 320 | 84503 | 85628 | 86765 | 87913 | 89074 | 90246 | 91430 | 92626 | 93835 | 95056 |
| 330° | 96289 | 97534 | 98793 | 100060 | 101350 | 102640 | 103950 | 105280 | 106610 | 107960 |
| 340 | 109320 | 110700 | 112090 | 113490 | 114910 | 116340 | 117780 | 119240 | 120720 | 122210 |
| 350 | 123710 | 125220 | 126760 | 128310 | 129870 | 131440 | 133030 | 134640 | 136270 | 137900 |
| 360 | 139560 | 141230 | 142920 | 144620 | 146340 | 148070 | 149820 | 151590 | 153380 | 155180 |
| 370 | 157000 | 158840 | 160690 | 162560 | 164450 | | | | | |

# WEIGHT OF A CUBIC FOOT OF SATURATED VAPOR.

## ENGLISH MEASURES.

| Temperature. | | Temperature. | .0 | .5 | Temperature. | .0 | .2 | .4 | .6 | .8 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Grains | F. | Grains | Grains | F. | Grains | Grains | Grains | Grains | Grains |
| −30° | 0.095 | +20° | 1.244 | 1.273 | +70° | 8.066 | 8.117 | 8.170 | 8.223 | 8.276 |
| 29 | 0.100 | 21 | 1.301 | 1.332 | 71 | 8.329 | 8.383 | 8.437 | 8.491 | 8.546 |
| 28 | 0.106 | 22 | 1.362 | 1.393 | 72 | 8.600 | 8.656 | 8.711 | 8.766 | 8.823 |
| 27 | 0.112 | 23 | 1.425 | 1.457 | 73 | 8.879 | 8.936 | 8.992 | 9.050 | 9.107 |
| 26 | 0.119 | 24 | 1.490 | 1.524 | 74 | 9.165 | 9.223 | 9.281 | 9.341 | 9.400 |
| −25 | 0.126 | +25 | 1.558 | 1.593 | +75 | 9.460 | 9.519 | 9.579 | 9.640 | 9.700 |
| 24 | 0.134 | 26 | 1.629 | 1.666 | 76 | 9.761 | 9.823 | 9.885 | 9.947 | 10.009 |
| 23 | 0.141 | 27 | 1.703 | 1.741 | 77 | 10.072 | 10.135 | 10.199 | 10.263 | 10.327 |
| 22 | 0.150 | 28 | 1.779 | 1.819 | 78 | 10.392 | 10.457 | 10.521 | 10.587 | 10.653 |
| 21 | 0.158 | 29 | 1.859 | 1.900 | 79 | 10.720 | 10.785 | 10.853 | 10.921 | 10.987 |
| −20 | 0.167 | +30 | 1.942 | 1.984 | +80 | 11.056 | 11.124 | 11.193 | 11.262 | 11.331 |
| 19 | 0.176 | 31 | 2.028 | 2.072 | 81 | 11.401 | 11.471 | 11.542 | 11.613 | 11.685 |
| 18 | 0.187 | 32 | 2.118 | 2.159 | 82 | 11.756 | 11.828 | 11.900 | 11.974 | 12.047 |
| 17 | 0.197 | 33 | 2.200 | 2.242 | 83 | 12.121 | 12.195 | 12.269 | 12.344 | 12.419 |
| 16 | 0.208 | 34 | 2.286 | 2.330 | 84 | 12.494 | 12.570 | 12.646 | 12.723 | 12.800 |
| −15 | 0.220 | +35 | 2.375 | 2.420 | +85 | 12.878 | 12.956 | 13.034 | 13.113 | 13.192 |
| 14 | 0.232 | 36 | 2.466 | 2.513 | 86 | 13.272 | 13.351 | 13.432 | 13.512 | 13.594 |
| 13 | 0.244 | 37 | 2.560 | 2.609 | 87 | 13.676 | 13.758 | 13.840 | 13.923 | 14.006 |
| 12 | 0.258 | 38 | 2.658 | 2.708 | 88 | 14.090 | 14.174 | 14.258 | 14.344 | 14.429 |
| 11 | 0.272 | 39 | 2.759 | 2.810 | 89 | 14.515 | 14.601 | 14.689 | 14.776 | 14.864 |
| −10 | 0.286 | +40 | 2.863 | 2.916 | +90 | 14.951 | 15.040 | 15.129 | 15.219 | 15.309 |
| 9 | 0.302 | 41 | 2.970 | 3.026 | 91 | 15.400 | 15.490 | 15.581 | 15.673 | 15.766 |
| 8 | 0.318 | 42 | 3.082 | 3.138 | 92 | 15.858 | 15.951 | 16.045 | 16.139 | 16.234 |
| 7 | 0.335 | 43 | 3.196 | 3.254 | 93 | 16.328 | 16.423 | 16.520 | 16.616 | 16.713 |
| 6 | 0.353 | 44 | 3.315 | 3.374 | 94 | 16.810 | 16.909 | 17.007 | 17.106 | 17.205 |
| − 5 | 0.371 | +45 | 3.436 | 3.499 | +95 | 17.305 | 17.406 | 17.506 | 17.607 | 17.709 |
| 4 | 0.391 | 46 | 3.563 | 3.627 | 96 | 17.812 | 17.914 | 18.018 | 18.121 | 18.226 |
| 3 | 0.411 | 47 | 3.693 | 3.759 | 97 | 18.330 | 18.436 | 18.542 | 18.648 | 18.755 |
| 2 | 0.433 | 48 | 3.828 | 3.895 | 98 | 18.863 | 18.971 | 19.079 | 19.188 | 19.298 |
| − 1 | 0.455 | 49 | 3.965 | 4.036 | 99 | 19.407 | 19.518 | 19.629 | 19.741 | 19.853 |
| ± 0 | 0.479 | +50 | 4.108 | 4.181 | +100 | 19.966 | 20.079 | 20.193 | 20.307 | 20.422 |
| + 1 | 0.503 | 51 | 4.255 | 4.331 | 101 | 20.538 | 20.654 | 20.770 | 20.887 | 21.005 |
| 2 | 0.529 | 52 | 4.407 | 4.485 | 102 | 21.123 | 21.242 | 21.362 | 21.481 | 21.602 |
| 3 | 0.556 | 53 | 4.564 | 4.644 | 103 | 21.723 | 21.845 | 21.967 | 22.090 | 22.213 |
| 4 | 0.584 | 54 | 4.725 | 4.807 | 104 | 22.337 | 22.462 | 22.588 | 22.714 | 22.839 |
| 5 | 0.613 | +55 | 4.891 | 4.976 | +105 | 22.966 | 23.095 | 23.223 | 23.351 | 23.481 |
| 6 | 0.644 | 56 | 5.062 | 5.149 | 106 | 23.611 | 23.742 | 23.873 | 24.005 | 24.138 |
| 7 | 0.676 | 57 | 5.238 | 5.328 | 107 | 24.271 | 24.405 | 24.539 | 24.673 | 24.809 |
| 8 | 0.709 | 58 | 5.420 | 5.513 | 108 | 24.946 | 25.082 | 25.220 | 25.358 | 25.597 |
| 9 | 0.744 | 59 | 5.607 | 5.703 | 109 | 25.636 | 25.776 | 25.917 | 26.058 | 26.201 |
| 10 | 0.780 | +60 | 5.800 | 5.899 | +110 | 26.343 | 26.486 | 26.630 | 26.775 | 26.920 |
| 11 | 0.818 | 61 | 5.999 | 6.099 | 111 | 27.066 | 27.213 | 27.360 | 27.508 | 27.657 |
| 12 | 0.858 | 62 | 6.203 | 6.306 | 112 | 27.807 | 27.956 | 28.107 | 28.259 | 28.411 |
| 13 | 0.900 | 63 | 6.413 | 6.521 | 113 | 28.563 | 28.717 | 28.871 | 29.026 | 29.181 |
| 14 | 0.943 | 64 | 6.630 | 6.740 | 114 | 29.338 | 29.495 | 29.653 | 29.812 | 29.970 |
| 15 | 0.988 | +65 | 6.852 | 6.966 | +115 | 30.130 | 30.291 | 30.452 | 30.614 | 30.777 |
| 16 | 1.035 | 66 | 7.082 | 7.198 | 116 | 30.940 | 31.104 | 31.270 | 31.435 | 31.601 |
| 17 | 1.084 | 67 | 7.317 | 7.437 | 117 | 31.768 | 31.937 | 32.106 | 32.274 | 32.445 |
| 18 | 1.135 | 68 | 7.560 | 7.683 | 118 | 32.616 | 32.787 | 32.960 | 33.133 | 33.307 |
| +19 | 1.189 | +69 | 7.809 | 7.937 | +119 | 33.482 | 33.657 | 33.834 | 34.010 | 34.189 |

# WEIGHT OF A CUBIC METER OF SATURATED VAPOR.

## METRIC MEASURES.

| Temperature. | | Temperature. | .0 | .5 | Temperature. | .0 | .2 | .4 | .6 | .8 |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | Grams. | C. | Grams. | Grams. | C. | Grams. | Grams. | Grams. | Grams. | Grams. |
| −29° | 0.378 | −17° | 1.174 | 1.123 | −5° | 3.261 | 3.208 | 3.157 | 3.106 | 3.056 |
| 28 | 0.418 | 16 | 1.284 | 1.228 | 4 | 3.534 | 3.478 | 3.422 | 3.368 | 3.314 |
| 27 | 0.461 | 15 | 1.403 | 1.342 | 3 | 3.828 | 3.767 | 3.708 | 3.649 | 3.591 |
| 26 | 0.508 | 14 | 1.531 | 1.466 | 2 | 4.144 | 4.078 | 4.015 | 3.951 | 3.889 |
| 25 | 0.559 | 13 | 1.671 | 1.599 | 1 | 4.482 | 4.412 | 4.344 | 4.276 | 4.209 |
| 24 | 0.615 | 12 | 1.820 | 1.744 | 0 | 4.847 | 4.771 | 4.697 | 4.624 | 4.553 |
| −23 | 0.677 | −11 | 1.983 | 1.900 | +0 | 4.847 | 4.914 | 4.982 | 5.051 | 5.121 |
| 22 | 0.743 | 10 | 2.158 | 2.069 | 1 | 5.192 | 5.264 | 5.336 | 5.409 | 5.483 |
| 21 | 0.816 | 9 | 2.347 | 2.251 | 2 | 5.559 | 5.634 | 5.711 | 5.789 | 5.868 |
| 20 | 0.894 | 8 | 2.551 | 2.447 | 3 | 5.947 | 6.028 | 6.110 | 6.192 | 6.275 |
| 19 | 0.980 | 7 | 2.770 | 2.658 | 4 | 6.360 | 6.445 | 6.532 | 6.619 | 6.708 |
| 18 | 1.073 | 6 | 3.006 | 2.886 | 5 | 6.797 | 6.888 | 6.979 | 7.072 | 7.166 |

| Temperature. | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 |
|---|---|---|---|---|---|---|---|---|---|---|
| C. | Grams. | Grams. | Grams. | Grams. | Grams. | Grams. | Grams. | Grams. | Grams. | Grams. |
| +6° | 7.261 | 7.309 | 7.357 | 7.405 | 7.453 | 7.502 | 7.552 | 7.601 | 7.651 | 7.701 |
| 7 | 7.751 | 7.802 | 7.853 | 7.904 | 7.956 | 8.007 | 8.059 | 8.112 | 8.164 | 8.217 |
| 8 | 8.271 | 8.324 | 8.378 | 8.432 | 8.487 | 8.542 | 8.597 | 8.652 | 8.708 | 8.764 |
| 9 | 8.821 | 8.877 | 8.934 | 8.991 | 9.049 | 9.106 | 9.165 | 9.223 | 9.282 | 9.341 |
| +10 | 9.401 | 9.461 | 9.521 | 9.582 | 9.643 | 9.704 | 9.765 | 9.827 | 9.889 | 9.952 |
| 11 | 10.015 | 10.078 | 10.142 | 10.205 | 10.270 | 10.334 | 10.400 | 10.465 | 10.530 | 10.597 |
| 12 | 10.664 | 10.730 | 10.797 | 10.865 | 10.932 | 11.001 | 11.069 | 11.138 | 11.208 | 11.278 |
| 13 | 11.348 | 11.418 | 11.489 | 11.561 | 11.632 | 11.704 | 11.777 | 11.850 | 11.922 | 11.997 |
| 14 | 12.070 | 12.144 | 12.219 | 12.295 | 12.370 | 12.446 | 12.523 | 12.600 | 12.677 | 12.754 |
| +15 | 12.832 | 12.911 | 12.990 | 13.068 | 13.148 | 13.229 | 13.309 | 13.390 | 13.472 | 13.553 |
| 16 | 13.635 | 13.718 | 13.801 | 13.885 | 13.969 | 14.053 | 14.139 | 14.224 | 14.309 | 14.395 |
| 17 | 14.482 | 14.569 | 14.657 | 14.744 | 14.833 | 14.922 | 15.011 | 15.101 | 15.191 | 15.282 |
| 18 | 15.373 | 15.465 | 15.557 | 15.650 | 15.743 | 15.836 | 15.931 | 16.025 | 16.121 | 16.216 |
| 19 | 16.311 | 16.409 | 16.505 | 16.603 | 16.701 | 16.799 | 16.898 | 16.998 | 17.097 | 17.198 |
| +20 | 17.300 | 17.401 | 17.503 | 17.606 | 17.708 | 17.812 | 17.917 | 18.021 | 18.126 | 18.232 |
| 21 | 18.338 | 18.445 | 18.553 | 18.660 | 18.768 | 18.878 | 18.987 | 19.097 | 19.207 | 19.319 |
| 22 | 19.430 | 19.542 | 19.655 | 19.769 | 19.882 | 19.996 | 20.112 | 20.227 | 20.343 | 20.461 |
| 23 | 20.578 | 20.695 | 20.814 | 20.933 | 21.053 | 21.173 | 21.295 | 21.416 | 21.538 | 21.660 |
| 24 | 21.783 | 21.907 | 22.032 | 22.157 | 22.282 | 22.409 | 22.536 | 22.663 | 22.791 | 22.920 |
| +25 | 23.049 | 23.179 | 23.310 | 23.442 | 23.573 | 23.706 | 23.839 | 23.973 | 24.107 | 24.242 |
| 26 | 24.378 | 24.514 | 24.651 | 24.790 | 24.929 | 25.066 | 25.206 | 25.346 | 25.488 | 25.629 |
| 27 | 25.771 | 25.915 | 26.058 | 26.203 | 26.348 | 26.494 | 26.641 | 26.787 | 26.936 | 27.084 |
| 28 | 27.234 | 27.384 | 27.534 | 27.686 | 27.837 | 27.990 | 28.143 | 28.298 | 28.453 | 28.609 |
| 29 | 28.765 | 28.923 | 29.081 | 29.239 | 29.399 | 29.559 | 29.720 | 29.881 | 30.044 | 30.207 |
| +30 | 30.371 | 30.535 | 30.701 | 30.867 | 31.034 | 31.202 | 31.371 | 31.540 | 31.710 | 31.880 |
| 31 | 32.052 | 32.225 | 32.398 | 32.572 | 32.747 | 32.923 | 33.100 | 33.277 | 33.454 | 33.633 |
| 32 | 33.812 | 33.993 | 34.175 | 34.356 | 34.540 | 34.723 | 34.909 | 35.094 | 35.280 | 35.467 |
| 33 | 35.656 | 35.844 | 36.034 | 36.224 | 36.416 | 36.609 | 36.801 | 36.995 | 37.190 | 37.386 |
| 34 | 37.583 | 37.780 | 37.979 | 38.178 | 38.378 | 38.579 | 38.782 | 38.984 | 39.187 | 39.393 |
| +35 | 39.599 | 39.805 | 40.013 | 40.221 | 40.430 | 40.640 | 40.851 | 41.064 | 41.277 | 41.491 |
| 36 | 41.706 | 41.921 | 42.139 | 42.356 | 42.575 | 42.795 | 43.015 | 43.237 | 43.459 | 43.683 |
| 37 | 43.908 | 44.134 | 44.360 | 44.587 | 44.815 | 45.046 | 45.277 | 45.507 | 45.740 | 45.973 |
| 38 | 46.208 | 46.443 | 46.680 | 46.918 | 47.156 | 47.396 | 47.636 | 47.878 | 48.121 | 48.365 |
| 39 | 48.609 | 48.855 | 49.103 | 49.350 | 49.600 | 49.850 | 50.101 | 50.353 | 50.606 | 50.861 |
| +40 | 51.117 | 51.373 | 51.631 | 51.890 | 52.150 | 52.410 | 52.673 | 52.936 | 53.200 | 53.466 |

# HYGROMETRICAL TABLES.

Reduction of psychrometric observations — English measures.

Values of $e = e' - 0.000367\, B\,(t - t')\left(1 + \frac{t' - 32}{1571}\right)$ . . TABLE 75

Relative humidity — Temperature Fahrenheit . . . . TABLE 76

Reduction of psychrometric observations — Metric Measures.

Values of $e = e' - 0.000660\, B\,(t - t')\,(1 + 0.00115\, t')$ . TABLE 77

Relative humidity — Temperature Centigrade . . . . TABLE 78

Rate of decrease of vapor pressure with altitude . . . . . TABLE 79

Reduction of snowfall measurements.

Depth of water corresponding to the weight of a cylindrical snow core 2.655 inches in diameter . . . . . . . TABLE 80

Depth of water corresponding to the weight of snow (or rain) collected in an 8-inch gage . . . . . . . . . . TABLE 81

Quantity of rainfall corresponding to given depths . . . TABLE 82

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B\,(t - t')\left(1 + \dfrac{t' - 32}{1571}\right)$

Pressure of Saturated Aqueous Vapor, $e$.

| Temperature. | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches | Inches. | Inches. | Inches. | Inches. | Inches. |
| −60° | .0010 | | | | | | | | | |
| 50 | 20 | .0018 | .0017 | .0016 | .0015 | .0014 | .0013 | .0012 | .0011 | .0011 |
| 40 | 38 | 36 | 33 | 31 | 29 | 28 | 26 | 24 | 23 | 21 |
| 30 | 71 | 66 | 62 | 59 | 55 | 52 | 49 | 46 | 43 | 40 |
| 20 | .0127 | .0120 | .0113 | .0107 | .0101 | .0095 | .0090 | .0084 | .0080 | .0075 |

$$e = e' - 0.000367\,B\,(t - t')\left(1 + \frac{t' - 32}{1571}\right)$$

$B = 30.0$ inches

| $t'$ | $t - t'$ .0 | .2 | .4 | .6 | .8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| −20° | .0127 | .0106 | .0085 | .0063 | .0042 | .0021 | | | | |
| 19 | 135 | 113 | 92 | 71 | 49 | 28 | .0007 | | | |
| 18 | 143 | 121 | .0100 | 79 | 57 | 36 | .0015 | | | |
| 17 | 151 | 130 | 108 | 87 | 66 | 44 | 23 | .0002 | | |
| 16 | 160 | 138 | 117 | 96 | 74 | 53 | 32 | .0010 | | |
| 15 | 169 | 148 | 126 | .0105 | 84 | 62 | 41 | 19 | | |
| 14 | 179 | 157 | 136 | 115 | 93 | 72 | 50 | 29 | .0008 | |
| 13 | 189 | 168 | 146 | 125 | .0103 | 82 | 61 | 39 | .0018 | |
| 12 | 200 | 178 | 157 | 136 | 114 | 93 | 71 | 50 | 29 | .0007 |
| 11 | 211 | 190 | 168 | 147 | 125 | .0104 | 83 | 61 | 40 | .0018 |
| 10 | 223 | 202 | 180 | 159 | 137 | 116 | 94 | 73 | 52 | 30 |
| 9 | 236 | 214 | 193 | 171 | 150 | 128 | .0107 | 85 | 64 | 43 |
| 8 | 249 | 227 | 206 | 184 | 163 | 141 | 120 | 98 | 77 | 56 |
| 7 | 263 | 241 | 220 | 198 | 177 | 155 | 134 | .0112 | 91 | 69 |
| 6 | 277 | 256 | 234 | 213 | 191 | 170 | 148 | 127 | .0105 | 84 |
| 5 | 292 | 271 | 249 | 228 | 206 | 185 | 163 | 142 | 120 | .0099 |
| 4 | 308 | 287 | 265 | 244 | 222 | 201 | 179 | 158 | 136 | .0115 |
| 3 | 325 | 304 | 282 | 261 | 239 | 218 | 196 | 175 | 153 | 132 |
| 2 | 343 | 321 | 300 | 278 | 257 | 235 | 214 | 192 | 171 | 149 |
| − 1 | 361 | 340 | 318 | 297 | 275 | 254 | 232 | 210 | 189 | 167 |
| ± 0 | 381 | 359 | 338 | 316 | 294 | 273 | 251 | 230 | 208 | 187 |
| + 1 | 401 | 380 | 358 | 337 | 315 | 293 | 272 | 250 | 229 | 207 |
| 2 | 423 | 401 | 379 | 358 | 336 | 315 | 293 | 271 | 250 | 228 |
| 3 | 445 | 423 | 402 | 380 | 359 | 337 | 315 | 294 | 272 | 250 |
| 4 | 468 | 447 | 425 | 404 | 382 | 360 | 339 | 317 | 295 | 274 |
| 5 | 493 | 471 | 450 | 428 | 407 | 385 | 363 | 342 | 320 | 298 |
| 6 | 519 | 497 | 476 | 454 | 432 | 411 | 389 | 367 | 346 | 324 |
| 7 | 546 | 524 | 503 | 481 | 459 | 438 | 416 | 394 | 373 | 351 |
| 8 | 574 | 552 | 531 | 509 | 487 | 466 | 444 | 422 | 401 | 379 |
| 9 | 604 | 582 | 560 | 539 | 517 | 495 | 474 | 452 | 430 | 408 |
| 10 | .0635 | .0613 | .0591 | .0569 | .0548 | .0526 | .0504 | .0483 | .0461 | .0439 |
| −20 to +10 | $\Delta e \times \Delta B$ | +.0001 | +.0001 | +.0002 | +.0003 | +.0004 | +.0004 | +.0005 | +.0006 | +.0007 |

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.
## ENGLISH MEASURES.

Values of $e = e' - 0.000367\, B\, (t - t') \left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.0$ inches

| $t'$ | $t - t'$ 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 |
|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| −10° | .0009 | | | | | | | | | |
| 9 | 21 | | | | | | | | | |
| 8 | 34 | .0013 | | | | | | | | |
| 7 | 48 | 26 | .0005 | | | | | | | |
| 6 | 62 | 41 | .0019 | | | | | | | |
| 5 | 77 | 56 | 34 | .0013 | | | | | | |
| 4 | 93 | 72 | 50 | 29 | .0007 | | | | | |
| 3 | .0110 | 88 | 67 | 45 | .0024 | .0002 | | | | |
| 2 | 127 | .0106 | 84 | 63 | 41 | .0020 | | | | |
| − 1 | 146 | 124 | .0103 | 81 | 60 | 38 | .0016 | | | |
| ± 0 | 165 | 144 | 122 | .0100 | 79 | 57 | 36 | .0014 | | |
| + 1 | 185 | 164 | 142 | 121 | 99 | 78 | 56 | 34 | .0013 | |
| 2 | 207 | 185 | 163 | 142 | .0120 | .0099 | 77 | 55 | 34 | .0012 |
| 3 | 229 | 207 | 186 | 164 | 142 | .0121 | 99 | 78 | 56 | 34 |
| 4 | 252 | 231 | 209 | 187 | 166 | 144 | .0122 | .0101 | 79 | 58 |
| 5 | 277 | 255 | 233 | 212 | 190 | 168 | 147 | 125 | .0104 | 82 |
| 6 | 302 | 281 | 259 | 237 | 216 | 194 | 172 | 151 | 129 | .0107 |
| 7 | 329 | 308 | 286 | 264 | 243 | 221 | 199 | 178 | 156 | 134 |
| 8 | 357 | 336 | 314 | 292 | 271 | 249 | 227 | 205 | 184 | 162 |
| 9 | 387 | 365 | 343 | 322 | 300 | 278 | 257 | 235 | 213 | 191 |
| 10 | .0417 | .0396 | .0374 | .0352 | .0331 | .0309 | .0287 | .0266 | .0244 | .0222 |
| −10 } +10 } $\Delta e \times \Delta B$ | +.0007 | +.0008 | +.0009 | +.0009 | +.0010 | +.0011 | +.0012 | +.0012 | +.0013 | +.0014 |

| $t'$ | $t-t'$ 4.0 | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 | 5.4 | 5.6 | 5.8 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 3° | .0013 | | | | | | | | | |
| 4 | 36 | .0014 | | | | | | | | |
| 5 | 60 | 39 | .0017 | | | | | | | |
| 6 | 86 | 64 | 42 | .0021 | | | | | | |
| 7 | .0113 | 91 | 69 | 47 | .0026 | .0004 | | | | |
| 8 | 140 | .0119 | 97 | 75 | 54 | 32 | .0010 | | | |
| 9 | 170 | 148 | .0126 | .0105 | 83 | 61 | 40 | .0018 | | |
| 10 | .0200 | .0179 | .0157 | .0135 | .0114 | .0092 | .0070 | .0048 | .0027 | .0005 |
| +10 $\Delta e \times \Delta B$ | +.0014 | +.0015 | +.0016 | +.0017 | +.0017 | +.0018 | +.0019 | +.0020 | +.0020 | +.0021 |

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B(t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.0$ inches

| $t'$ | $t - t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 10° | $\Delta e \times \Delta B$ | +.0004 | +.0007 | +.0011 | +.0014 | +.0018 | +.0022 | +.0025 | +.0029 | +.0033 |
| 10° | 0.063 | 0.053 | 0.042 | 0.031 | 0.020 | 0.009 | | | | |
| 11 | 67 | 56 | 45 | 34 | 23 | .012 | 0.002 | | | |
| 12 | 70 | 59 | 48 | 37 | 27 | 16 | 5 | | | |
| 13 | 74 | 63 | 52 | 41 | 30 | 19 | 8 | | | |
| 14 | 77 | 66 | 56 | 45 | 34 | 23 | .012 | 0.001 | | |
| 15 | 81 | 70 | 59 | 49 | 38 | 27 | 16 | 5 | | |
| 16 | 85 | 74 | 63 | 53 | 42 | 31 | 20 | 9 | | |
| 17 | 89 | 79 | 68 | 57 | 46 | 35 | 24 | .013 | 0.002 | |
| 18 | 94 | 83 | 72 | 61 | 50 | 39 | 28 | 18 | 7 | |
| 19 | .099 | 88 | 77 | 66 | 55 | 44 | 33 | 22 | 11 | 0.000 |
| 20 | .103 | 92 | 81 | 71 | 60 | 49 | 38 | 27 | 16 | .005 |
| 21 | .108 | 97 | 86 | 76 | 65 | 54 | 43 | 32 | 21 | .010 |
| 22 | .114 | .103 | 92 | 81 | 70 | 59 | 48 | 37 | 26 | 15 |
| 23 | .119 | .108 | 97 | 86 | 75 | 64 | 53 | 42 | 32 | 21 |
| 24 | .125 | .114 | .103 | 92 | 81 | 70 | 59 | 48 | 37 | 26 |
| 25 | .131 | .120 | .109 | 98 | 87 | 76 | 65 | 54 | 43 | 32 |
| 26 | .137 | .126 | .115 | .104 | 93 | 82 | 71 | 60 | 49 | 38 |
| 27 | .143 | .133 | .122 | .111 | .100 | 89 | 78 | 67 | 56 | 45 |
| 28 | .150 | .139 | .128 | .117 | .106 | 95 | 84 | 73 | 62 | 51 |
| 29 | .157 | .146 | .135 | .124 | .113 | .102 | 91 | 80 | 69 | 58 |
| 30 | .165 | .154 | .143 | .132 | .121 | .110 | 99 | 88 | 77 | 66 |
| 31 | .172 | .161 | .150 | .139 | .128 | .117 | .106 | 95 | 84 | 73 |
| 32 | .180 | .169 | .158 | .147 | .136 | .125 | .114 | .103 | 92 | 81 |
| 33 | .188 | .177 | .166 | .155 | .144 | .133 | .122 | .111 | .100 | 89 |
| 34 | .195 | .184 | .173 | .162 | .151 | .140 | .129 | .118 | .107 | 96 |
| 35 | .203 | .192 | .181 | .170 | .159 | .148 | .137 | .126 | .115 | .104 |
| 36 | .212 | .201 | .190 | .179 | .168 | .157 | .145 | .134 | .123 | .112 |
| 37 | .220 | .209 | .198 | .187 | .176 | .165 | .154 | .143 | .132 | .121 |
| 38 | .229 | .218 | .207 | .196 | .185 | .174 | .163 | .152 | .141 | .130 |
| 39 | .238 | .227 | .216 | .205 | .194 | .183 | .172 | .161 | .150 | .139 |
| 40 | .248 | .237 | .226 | .215 | .203 | .192 | .181 | .170 | .159 | .148 |
| 41 | .258 | .246 | .235 | .224 | .213 | .202 | .191 | .180 | .169 | .158 |
| 42 | .268 | .257 | .246 | .234 | .223 | .212 | .201 | .190 | .179 | .168 |
| 43 | .278 | .267 | .256 | .245 | .234 | .223 | .212 | .201 | .190 | .178 |
| 44 | .289 | .278 | .267 | .256 | .245 | .234 | .223 | .211 | .200 | .189 |
| 45 | .300 | .289 | .278 | .267 | .256 | .245 | .234 | .223 | .211 | .200 |
| 46 | .312 | .301 | .290 | .279 | .268 | .256 | .245 | .234 | .223 | .212 |
| 47 | .324 | .313 | .302 | .291 | .280 | .268 | .257 | .246 | .235 | .224 |
| 48 | .336 | .325 | .314 | .303 | .292 | .281 | .270 | .259 | .248 | .236 |
| 49 | .349 | .338 | .327 | .316 | .305 | .294 | .283 | .271 | .260 | .249 |
| 50 | .363 | .351 | .340 | .329 | .318 | .307 | .296 | .285 | .274 | .262 |
| 51 | .376 | .365 | .354 | .343 | .332 | .321 | .309 | .298 | .287 | .276 |
| 52 | .390 | .379 | .368 | .357 | .346 | .335 | .324 | .312 | .301 | .290 |
| 53 | .405 | .394 | .383 | .372 | .361 | .349 | .338 | .327 | .316 | .305 |
| 54 | .420 | .409 | .398 | .387 | .376 | .364 | .353 | .342 | .331 | .320 |
| 55 | .436 | .425 | .414 | .402 | .391 | .380 | .369 | .358 | .347 | .335 |
| 56 | .452 | .441 | .430 | .419 | .407 | .396 | .385 | .374 | .363 | .352 |
| 57 | .469 | .458 | .446 | .435 | .424 | .413 | .402 | .390 | .379 | .368 |
| 58 | .486 | .475 | .464 | .452 | .441 | .430 | .419 | .408 | .396 | .385 |
| 59 | .504 | .493 | .481 | .470 | .459 | .448 | .437 | .425 | .414 | .403 |
| 60 | 0.522 | 0.511 | 0.500 | 0.488 | 0.477 | 0.466 | 0.455 | 0.444 | 0.432 | 0.421 |
| 60 | $\Delta e \times \Delta B$ | +.0004 | +.0007 | +.0011 | +.0015 | +.0019 | +.0022 | +.0026 | +.0030 | +.0034 |

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B\,(t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.00$

| $t'$ | $t - t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 30° $\Delta e \times \Delta B$ | +.0037 | +.0040 | +.0044 | +.0048 | +.0051 | +.0055 | +.0059 | +.0062 | +.0066 | +.0070 |
| 22° | 0.004 | | | | | | | | | |
| 23 | .010 | | | | | | | | | |
| 24 | 15 | | | | | | | | | |
| 25 | 21 | 0.010 | | | | | | | | |
| 26 | 27 | 16 | 0.005 | | | | | | | |
| 27 | 34 | 23 | .012 | 0.001 | | | | | | |
| 28 | 40 | 29 | 18 | 7 | | | | | | |
| 29 | 47 | 36 | 25 | .014 | 0.003 | | | | | |
| 30 | 55 | 44 | 33 | 22 | .011 | 0.000 | | | | |
| 31 | 62 | 51 | 40 | 29 | 18 | .007 | | | | |
| 32 | 70 | 59 | 48 | 37 | 26 | .015 | 0.004 | | | |
| 33 | 78 | 67 | 55 | 44 | 33 | 22 | 11 | 0.000 | | |
| 34 | 85 | 74 | 63 | 52 | 41 | 30 | 19 | .008 | | |
| 35 | 93 | 82 | 71 | 60 | 49 | 38 | 27 | .016 | 0.005 | |
| 36 | .101 | 90 | 79 | 68 | 57 | 46 | 35 | 24 | .013 | 0.002 |
| 37 | .110 | 99 | 88 | 77 | 66 | 55 | 43 | 32 | 21 | .010 |
| 38 | .119 | .108 | 96 | 85 | 74 | 63 | 52 | 41 | 30 | 19 |
| 39 | .128 | .117 | .105 | 94 | 83 | 72 | 61 | 50 | 39 | 28 |
| 40 | .137 | .126 | .115 | .104 | 93 | 82 | 71 | 60 | 49 | 37 |
| 41 | .147 | .136 | .125 | .114 | .103 | 91 | 80 | 69 | 58 | 47 |
| 42 | .157 | .146 | .135 | .124 | .113 | .101 | 90 | 79 | 68 | 57 |
| 43 | .167 | .156 | .145 | .134 | .123 | .112 | .101 | 90 | 79 | 68 |
| 44 | .178 | .167 | .156 | .145 | .134 | .123 | .112 | .100 | 89 | 78 |
| 45 | .189 | .178 | .167 | .156 | .145 | .134 | .123 | .112 | .100 | 89 |
| 46 | .201 | .190 | .179 | .168 | .156 | .145 | .134 | .123 | .112 | .101 |
| 47 | .213 | .202 | .191 | .180 | .168 | .157 | .146 | .135 | .124 | .113 |
| 48 | .225 | .214 | .203 | .192 | .181 | .170 | .159 | .147 | .136 | .125 |
| 49 | .238 | .227 | .216 | .205 | .193 | .182 | .171 | .160 | .149 | .138 |
| 50 | .251 | .240 | .229 | .218 | .207 | .196 | .184 | .173 | .162 | .151 |
| 51 | .265 | .254 | .243 | .231 | .220 | .209 | .198 | .187 | .176 | .165 |
| 52 | .279 | .268 | .257 | .246 | .234 | .223 | .212 | .201 | .190 | .179 |
| 53 | .294 | .282 | .271 | .260 | .249 | .238 | .227 | .216 | .204 | .193 |
| 54 | .309 | .297 | .286 | .275 | .264 | .253 | .242 | .231 | .219 | .208 |
| 55 | .324 | .313 | .302 | .291 | .280 | .268 | .257 | .246 | .235 | .224 |
| 56 | .340 | .329 | .318 | .307 | .296 | .285 | .273 | .262 | .251 | .240 |
| 57 | .357 | .346 | .334 | .323 | .312 | .301 | .290 | .279 | .267 | .256 |
| 58 | .374 | .363 | .352 | .340 | .329 | .318 | .307 | .296 | .284 | .273 |
| 59 | .392 | .381 | .369 | .358 | .347 | .336 | .325 | .313 | .302 | .291 |
| 60 | 0.410 | 0.399 | 0.388 | 0.376 | 0.365 | 0.354 | 0.343 | 0.331 | 0.320 | 0.309 |
| 60 $\Delta e \times \Delta B$ | +.0037 | +.0041 | +.0045 | +.0049 | +.0052 | +.0056 | +.0060 | +.0064 | +.0067 | +.0071 |

TABLE 75.

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### ENGLISH MEASURES.

Values of $e = e' - 0.000367\ B\ (t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.00$

| $t'$ | $t-t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 40° $\Delta e \times \Delta B$ | +.0074 | +.0077 | +.0081 | +.0085 | +.0089 | +.0092 | +.0096 | +.0100 | +.0103 | +.0107 |
| 38° | 0.008 | | | | | | | | | |
| 39 | .017 | 0.006 | | | | | | | | |
| 40 | 26 | .015 | 0.004 | | | | | | | |
| 41 | 36 | 25 | .014 | 0.003 | | | | | | |
| 42 | 46 | 35 | 24 | .013 | 0.002 | | | | | |
| 43 | 56 | 45 | 34 | 23 | .012 | 0.001 | | | | |
| 44 | 67 | 56 | 45 | 34 | 23 | .012 | 0.001 | | | |
| 45 | 78 | 67 | 56 | 45 | 34 | 23 | .012 | 0.001 | | |
| 46 | 90 | 79 | 68 | 57 | 45 | 34 | 23 | .012 | 0.001 | |
| 47 | .102 | 91 | 79 | 68 | 57 | 46 | 35 | 24 | 13 | 0.002 |
| 48 | .114 | .103 | 92 | 81 | 70 | 58 | 47 | 36 | 25 | .014 |
| 49 | .127 | .116 | .104 | 93 | 82 | 71 | 60 | 49 | 38 | 27 |
| 50 | .140 | .129 | .118 | .106 | 95 | 84 | 73 | 62 | 51 | 40 |
| 51 | .153 | .142 | .131 | .120 | .109 | 98 | 87 | 75 | 64 | 53 |
| 52 | .167 | .156 | .145 | .134 | .123 | .112 | .101 | 89 | 78 | 67 |
| 53 | .182 | .171 | .160 | .149 | .137 | .126 | .115 | .104 | 93 | 82 |
| 54 | .197 | .186 | .175 | .164 | .152 | .141 | .130 | .119 | .108 | 97 |
| 55 | .212 | .201 | .190 | .179 | .168 | .157 | .145 | .134 | .123 | .112 |
| 56 | .229 | .218 | .206 | .195 | .184 | .173 | .162 | .150 | .139 | .128 |
| 57 | .245 | .234 | .223 | .211 | .200 | .189 | .178 | .167 | .156 | .144 |
| 58 | .262 | .251 | .240 | .228 | .217 | .206 | .195 | .184 | .173 | .161 |
| 59 | .280 | .269 | .257 | .246 | .235 | .224 | .213 | .201 | .190 | .179 |
| 60 | 0.298 | 0.287 | 0.275 | 0.264 | 0.253 | 0.242 | 0.231 | 0.219 | 0.208 | 0.197 |
| 60 $\Delta e \times \Delta B$ | +.0075 | +.0078 | +.0082 | +.0086 | +.0090 | +.0093 | +.0097 | +.0101 | +.0105 | +.0108 |

| $t'$ | $t-t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 50° $\Delta e \times \Delta B$ | +.0111 | +.0115 | +.0119 | +.0122 | +.0126 | +.0130 | +.0134 | +.0137 | +.0141 | +.0145 |
| 48° | 0.003 | | | | | | | | | |
| 49 | .015 | .004 | | | | | | | | |
| 50 | 29 | .017 | 0.006 | | | | | | | |
| 51 | 42 | 31 | .020 | 0.009 | | | | | | |
| 52 | 56 | 45 | 34 | .023 | 0.011 | 0.000 | | | | |
| 53 | 70 | 59 | 48 | 37 | 26 | .015 | 0.004 | | | |
| 54 | 85 | 74 | 63 | 52 | 41 | 30 | .018 | 0.007 | | |
| 55 | .101 | 90 | 78 | 67 | 56 | 45 | 34 | .023 | 0.011 | 0.000 |
| 56 | .117 | .106 | 95 | 83 | 72 | 61 | 50 | 39 | 28 | .016 |
| 57 | .133 | .122 | .111 | .100 | 88 | 77 | 66 | 55 | 44 | 32 |
| 58 | .150 | .139 | .128 | .117 | .105 | 94 | 83 | 72 | 61 | 49 |
| 59 | .168 | .157 | .145 | .134 | .123 | .112 | .101 | 89 | 78 | 67 |
| 60 | 0.186 | 0.175 | 0.163 | 0.152 | 0.141 | 0.130 | 0.119 | 0.107 | 0.096 | 0.085 |
| 60 $\Delta e \times \Delta B$ | +.0112 | +.0116 | +.0120 | +.0123 | +.0127 | +.0131 | +.0134 | +.0138 | +.0142 | +.0146 |

| $t'$ | $t-t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 41 | 42 | 43 | 44 | 45 | 46 | | | |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | | | |
| 56° | 0.005 | | | | | | | | | |
| 57 | .021 | 0.010 | | | | | | | | |
| 58 | 38 | 27 | 0.016 | 0.005 | | | | | | |
| 59 | 56 | 45 | 33 | .022 | 0.011 | 0.000 | | | | |
| 60 | 0.074 | 0.063 | 0.051 | 0.040 | 0.029 | 0.018 | 0.007 | | | |
| 60 $\Delta e \times \Delta B$ | +.0149 | +.0153 | +.0157 | +.0161 | +.0164 | +.0168 | +.0172 | | | |

# REDUCTION OF PSYCHROMETRIC OBSERVATION.

## ENGLISH MEASURES.

Values of $e = e' - 0.000367\, B\, (t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.00$

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 1.0 | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 8.0 | 9.0 | 10.0 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 60° | $\Delta e \times \Delta B$ | +.0004 | +.0007 | +.0011 | +.0015 | +.0019 | +.0022 | +.0026 | +.0030 | +.0034 | +.0037 |
| 60° | 0.522 | 0.511 | 0.500 | 0.488 | 0.477 | 0.466 | 0.455 | 0.444 | 0.432 | 0.421 | 0.410 |
| 61 | .541 | .530 | .518 | .507 | .496 | .485 | .474 | .462 | .451 | .440 | .429 |
| 62 | .560 | .549 | .538 | .527 | .516 | .504 | .493 | .482 | .471 | .459 | .448 |
| 63 | .580 | 569 | .558 | .547 | .536 | .524 | .513 | .502 | .491 | .479 | .468 |
| 64 | .601 | .590 | .579 | .568 | .556 | .545 | .534 | .523 | .511 | .500 | .489 |
| 65 | .623 | .611 | .600 | .589 | .578 | .566 | .555 | .544 | .533 | .521 | .510 |
| 66 | .645 | .633 | .622 | .611 | .600 | .588 | .577 | .566 | .555 | .543 | .532 |
| 67 | .667 | .656 | .645 | .634 | .622 | .611 | .600 | .589 | .577 | .566 | .555 |
| 68 | .691 | .680 | .668 | .657 | .646 | .635 | .623 | .612 | .601 | .590 | .578 |
| 69 | .715 | .704 | .692 | .681 | .670 | .659 | .647 | .636 | .625 | .614 | .602 |
| 70 | .740 | .729 | .717 | .706 | .695 | .684 | .672 | .661 | .650 | .638 | .627 |
| 71 | .766 | .754 | .743 | .732 | .720 | .709 | .698 | .687 | .675 | .664 | .653 |
| 72 | .792 | .781 | .769 | .758 | .747 | .735 | .724 | .713 | .702 | .690 | .679 |
| 73 | .819 | .808 | .797 | .785 | .774 | .763 | .751 | .740 | .729 | .717 | .706 |
| 74 | .847 | .836 | .824 | .813 | .802 | .791 | .779 | .768 | .757 | .745 | .734 |
| 75 | .876 | .865 | .853 | .842 | .831 | .819 | .808 | .797 | .786 | .774 | .763 |
| 76 | .906 | .894 | .883 | .872 | .860 | .849 | .838 | .826 | .815 | .804 | .792 |
| 77 | .936 | .925 | .914 | .902 | .891 | .880 | .868 | .857 | .846 | .834 | .823 |
| 78 | .968 | .956 | .945 | .934 | .922 | .911 | .900 | .888 | .877 | .866 | .854 |
| 79 | 1.000 | .989 | .977 | .966 | .955 | .943 | .932 | .921 | .909 | .898 | .887 |
| 80 | 1.033 | 1.022 | 1.011 | .999 | .988 | .977 | .965 | .954 | .943 | .931 | .920 |
| 81 | .068 | .056 | .045 | 1.034 | 1.022 | 1.011 | .999 | .988 | .977 | .965 | .954 |
| 82 | .103 | .092 | .080 | .069 | .057 | .046 | 1.035 | 1.023 | 1.012 | 1.001 | .989 |
| 83 | .139 | .128 | .116 | .105 | .094 | .082 | .071 | .060 | .048 | .037 | 1.026 |
| 84 | .176 | .165 | .154 | .142 | .131 | .120 | .108 | .097 | .086 | .074 | .063 |
| 85 | 1.215 | 1.204 | 1.192 | 1.181 | 1.169 | 1.158 | 1.147 | 1.135 | 1.124 | 1.112 | 1.101 |
| 86 | .254 | .243 | .232 | .220 | .209 | .197 | .186 | .175 | .163 | .152 | .140 |
| 87 | .295 | .284 | .272 | .261 | .249 | .238 | .227 | .215 | .204 | .192 | .181 |
| 88 | .336 | .325 | .314 | .302 | .291 | .279 | .268 | .257 | .245 | .234 | .222 |
| 89 | .379 | .368 | .357 | .345 | .334 | .322 | .311 | .300 | .288 | .277 | .265 |
| 90 | 1.423 | 1.412 | 1.401 | 1.389 | 1.378 | 1.366 | 1.355 | 1.343 | 1.332 | 1.321 | 1.309 |
| 91 | .469 | .457 | .446 | .435 | .423 | .412 | .400 | .389 | .377 | .366 | .355 |
| 92 | .515 | .504 | .492 | .481 | .470 | .458 | .447 | .435 | .424 | .412 | .401 |
| 93 | .563 | .552 | .540 | .529 | .517 | .506 | .494 | .483 | .471 | .460 | .449 |
| 94 | .612 | .601 | .589 | .578 | .566 | .555 | .543 | .532 | .521 | .509 | .498 |
| 95 | 1.662 | 1.651 | 1.640 | 1.628 | 1.617 | 1.605 | 1.594 | 1.582 | 1.571 | 1.559 | 1.548 |
| 96 | .714 | .703 | .691 | .680 | .668 | .657 | .646 | .634 | .623 | .611 | .600 |
| 97 | .767 | .756 | .744 | .733 | .722 | .710 | .699 | .687 | .776 | .664 | .653 |
| 98 | .822 | .811 | .799 | .788 | .776 | .765 | .753 | .742 | .730 | .719 | .707 |
| 99 | .878 | .867 | .855 | .844 | .832 | .821 | .809 | .798 | .786 | .775 | .763 |
| 100 | 1.936 | 1.924 | 1.913 | 1.901 | 1.890 | 1.878 | 1.867 | 1.855 | 1.844 | 1.832 | 1.821 |
| 101 | .994 | .983 | .972 | .960 | .949 | .937 | .926 | .914 | .903 | .891 | .880 |
| 102 | 2.055 | 2.043 | 2.032 | 2.020 | 2.009 | .997 | .986 | .974 | .963 | .951 | .940 |
| 103 | .117 | .106 | .094 | .083 | .071 | 2.060 | 2.048 | 2.037 | 2.025 | 2.014 | 2.002 |
| 104 | .181 | .169 | .158 | .146 | .135 | .123 | .112 | .100 | .089 | .077 | .066 |
| 105 | 2.246 | 2.235 | 2.223 | 2.212 | 2.200 | 2.189 | 2.177 | 2.166 | 2.154 | 2.143 | 2.131 |
| 106 | .314 | .302 | .290 | .279 | .267 | .256 | .244 | .233 | .221 | .210 | .198 |
| 107 | .382 | .371 | .359 | .348 | .336 | .325 | .313 | .302 | .290 | .278 | .267 |
| 108 | .453 | .441 | .430 | .418 | .407 | .395 | .384 | .372 | .361 | .349 | .337 |
| 109 | .525 | .514 | .502 | .491 | .479 | .467 | .456 | .444 | .433 | .421 | .410 |
| 110 | 2.599 | 2.588 | 2.576 | 2.565 | 2.553 | 2.542 | 2.530 | 2.519 | 2.507 | 2.495 | 2.484 |
| 110 | $\Delta e \times \Delta B$ | +.0004 | +.0008 | +.0012 | +.015 | +.0019 | +.0023 | +.0027 | +.0031 | +.0035 | +.0039 |

Table 75.

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B\,(t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.00$

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 60° | $\Delta e \times \Delta B$ | +.0041 | +.0045 | +.0049 | +.0052 | +.0056 | +.0060 | +.0063 | +.0067 | +.0071 | +.0075 |
| 60° | 0.522 | 0.399 | 0.388 | 0.376 | 0.365 | 0.354 | 0.343 | 0.331 | 0.320 | 0.309 | 0.298 |
| 61 | .541 | 0.418 | .406 | .395 | .384 | .373 | .361 | .350 | .339 | .328 | .317 |
| 62 | .560 | .437 | .426 | .415 | .403 | .392 | .381 | .370 | .358 | .347 | .336 |
| 63 | .580 | .457 | .446 | .435 | .423 | .412 | .401 | .390 | .378 | .367 | .356 |
| 64 | .601 | .478 | .466 | .455 | .444 | .433 | .422 | .410 | .399 | .388 | .377 |
| 65 | .623 | .499 | .488 | .476 | .465 | .454 | .443 | .431 | .420 | .409 | .398 |
| 66 | .645 | .521 | .510 | .498 | .487 | .476 | .465 | .453 | .442 | .431 | .420 |
| 67 | .667 | .544 | .532 | .521 | .510 | .499 | .487 | .476 | .465 | .454 | .442 |
| 68 | .691 | .567 | .556 | .544 | .533 | .522 | .511 | .499 | .488 | .477 | .466 |
| 69 | .715 | .591 | .580 | .568 | .557 | .546 | .535 | .523 | .512 | .501 | .490 |
| 70 | .740 | .616 | .605 | .593 | .582 | .571 | .559 | .548 | .537 | .526 | .514 |
| 71 | .766 | .641 | .630 | .619 | .608 | .596 | .585 | .574 | .562 | .551 | .540 |
| 72 | .792 | .668 | .656 | .645 | .634 | .623 | .611 | .600 | .589 | .577 | .566 |
| 73 | .819 | .695 | .684 | .672 | .661 | .650 | .638 | .627 | .616 | .604 | .593 |
| 74 | .847 | .723 | .711 | .700 | .689 | .678 | .666 | .655 | .644 | .632 | .621 |
| 75 | .876 | .752 | .740 | .729 | .718 | .706 | .695 | .684 | .672 | .661 | .650 |
| 76 | .906 | .781 | .770 | .758 | .747 | .736 | .725 | .713 | .702 | .691 | .679 |
| 77 | .936 | .812 | .800 | .789 | .778 | .766 | .755 | .744 | .732 | .721 | .710 |
| 78 | .968 | .843 | .832 | .820 | .809 | .798 | .786 | .775 | .764 | .752 | .741 |
| 79 | 1.000 | .875 | .864 | .853 | .841 | .830 | .819 | .807 | .796 | .785 | .773 |
| 80 | 1.033 | .909 | .897 | .886 | .875 | .863 | .852 | .841 | .829 | .818 | .806 |
| 81 | .068 | .943 | .931 | .920 | .909 | .897 | .886 | .875 | .863 | .852 | .841 |
| 82 | .103 | .978 | .967 | .955 | .944 | .932 | .921 | .910 | .898 | .887 | .876 |
| 83 | .139 | 1.014 | 1.003 | .991 | .980 | .969 | .957 | .946 | .935 | .923 | .912 |
| 84 | .176 | .051 | .040 | 1.029 | 1.017 | 1.006 | .995 | .983 | .972 | .960 | .949 |
| 85 | 1.215 | 1.090 | 1.078 | 1.067 | 1.056 | 1.044 | 1.033 | 1.021 | 1.010 | .999 | .987 |
| 86 | .254 | .129 | .118 | .106 | .095 | .083 | .072 | .061 | .049 | 1.038 | 1.027 |
| 87 | .295 | .170 | .158 | .147 | .135 | .124 | .113 | .101 | .090 | .078 | .067 |
| 88 | .336 | .211 | .200 | .188 | .177 | .165 | .154 | .143 | .131 | .120 | .108 |
| 89 | .379 | .254 | .242 | .231 | .220 | .208 | .197 | .185 | .174 | .163 | .151 |
| 90 | 1.423 | 1.298 | 1.286 | 1.275 | 1.264 | 1.252 | 1.241 | 1.229 | 1.218 | 1.206 | 1.195 |
| 91 | .469 | .343 | .332 | .320 | .309 | .297 | .286 | .275 | .263 | .252 | .240 |
| 92 | .515 | .390 | .378 | .367 | .355 | .344 | .332 | .321 | .310 | .298 | .287 |
| 93 | .563 | .437 | .426 | .414 | .403 | .391 | .380 | .369 | .357 | .346 | .334 |
| 94 | .612 | .486 | .475 | .463 | .452 | .440 | .429 | .418 | .406 | .395 | .383 |
| 95 | 1.662 | 1.537 | 1.525 | 1.514 | 1.502 | 1.491 | 1.479 | 1.468 | 1.456 | 1.445 | 1.433 |
| 96 | .714 | .588 | .577 | .565 | .554 | .542 | .531 | .520 | .508 | .497 | .485 |
| 97 | .767 | .641 | .630 | .618 | .607 | .595 | .584 | .572 | .561 | .550 | .538 |
| 98 | .822 | .696 | .684 | .673 | .661 | .650 | .638 | .627 | .615 | .604 | .593 |
| 99 | .878 | .752 | .740 | .729 | .717 | .706 | .694 | .683 | .671 | .660 | .648 |
| 100 | 1.936 | 1.809 | 1.798 | 1.786 | 1.775 | 1.763 | 1.752 | 1.740 | 1.729 | 1.717 | 1.706 |
| 101 | .994 | .868 | .857 | .845 | .834 | .822 | .811 | .799 | .788 | .776 | .765 |
| 102 | 2.055 | .928 | .917 | .905 | .894 | .882 | .871 | .859 | .848 | .836 | .825 |
| 103 | .117 | .991 | .979 | .968 | .956 | .944 | .933 | .921 | .910 | .898 | .887 |
| 104 | .181 | 2.054 | 2.043 | 2.031 | 2.020 | 2.008 | .997 | .985 | .974 | .962 | .951 |
| 105 | 2.246 | 2.120 | 2.108 | 2.097 | 2.085 | 2.073 | 2.062 | 2.050 | 2.039 | 2.027 | 2.016 |
| 106 | .314 | .187 | .175 | .164 | .152 | .141 | .129 | .118 | .106 | .094 | .083 |
| 107 | .382 | .255 | .244 | .232 | .221 | .209 | .198 | .186 | .175 | .163 | .152 |
| 108 | .453 | .326 | .314 | .302 | .291 | .280 | .268 | .257 | .245 | .234 | .222 |
| 109 | .525 | .398 | .387 | .375 | .364 | .352 | .340 | .329 | .317 | .306 | .294 |
| 110 | 2.599 | 2.472 | 2.461 | 2.449 | 2.438 | 2.426 | 2.414 | 2.403 | 2.391 | 2.380 | 2.368 |
| 110 | $\Delta e \times \Delta B$ | +.0042 | +.0046 | +.0050 | +.0054 | +.0058 | +.0062 | +.0065 | +.0069 | +.0073 | +.0077 |

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## ENGLISH MEASURES.

Values of $e=e'-0.000367\,B\,(t-t')\left(1+\dfrac{t'-32}{1571}\right)$

$B=30.00$

| $t'$ | $t-t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 60° | $\Delta e \times \Delta B$ | +.0078 | +.0082 | +.0086 | +.0090 | +.0093 | +.0097 | +.0101 | +.0105 | +.0108 | +.0112 |
| 60° | 0.522 | 0.287 | 0.275 | 0.264 | 0.253 | 0.242 | 0.231 | 0.219 | 0.208 | 0.197 | 0.186 |
| 61 | .541 | 0.305 | .294 | .283 | .272 | .261 | .249 | .238 | .227 | .216 | .205 |
| 62 | .560 | .325 | .314 | .302 | .291 | .280 | .269 | .257 | .246 | .235 | .224 |
| 63 | .580 | .345 | .334 | .322 | .311 | .300 | .289 | .277 | .266 | .255 | .244 |
| 64 | .601 | .365 | .354 | .343 | .332 | .320 | .309 | .298 | .287 | .276 | .264 |
| 65 | .623 | .387 | .375 | .364 | .353 | .342 | .330 | .319 | .308 | .297 | .285 |
| 66 | .645 | .408 | .397 | .386 | .375 | .363 | .352 | .341 | .330 | .319 | .307 |
| 67 | .667 | .431 | .420 | .409 | .397 | .386 | .375 | .364 | .352 | .341 | .330 |
| 68 | .691 | .454 | .443 | .432 | .421 | .409 | .398 | .387 | .376 | .364 | .353 |
| 69 | .715 | .478 | .467 | .456 | .445 | .433 | .422 | .411 | .399 | .388 | .377 |
| 70 | .740 | .503 | .492 | .481 | .469 | .458 | .447 | .435 | .424 | .413 | .402 |
| 71 | .766 | .529 | .517 | .506 | .495 | .483 | .472 | .461 | .450 | .438 | .427 |
| 72 | .792 | .555 | .544 | .532 | .521 | .510 | .498 | .487 | .476 | .464 | .453 |
| 73 | .819 | .582 | .571 | .559 | .548 | .537 | .525 | .514 | .503 | .491 | .480 |
| 74 | .847 | .610 | .598 | .587 | .576 | .564 | .553 | .542 | 531 | .519 | .508 |
| 75 | .876 | .638 | .627 | .616 | .605 | .593 | .582 | .571 | .559 | .548 | .537 |
| 76 | .906 | .668 | .657 | .645 | .634 | .623 | .611 | .600 | .589 | .577 | .566 |
| 77 | .936 | .698 | .687 | .676 | .664 | .653 | .642 | .630 | .619 | .608 | .596 |
| 78 | .968 | .730 | .718 | .707 | .696 | .684 | .673 | .662 | .650 | .639 | .628 |
| 79 | 1.000 | .762 | .751 | .739 | .728 | .717 | .705 | .694 | .683 | .671 | .660 |
| 80 | 1.033 | .795 | .784 | .772 | .761 | .750 | .738 | .727 | .716 | .704 | .693 |
| 81 | .068 | .829 | .818 | .806 | .795 | .784 | .772 | .761 | .750 | .738 | .727 |
| 82 | .103 | .864 | .853 | .842 | .830 | .819 | .808 | .796 | .785 | .773 | .762 |
| 83 | .139 | .900 | .889 | .878 | .866 | .855 | .844 | .832 | .821 | .810 | .798 |
| 84 | .176 | .938 | .926 | .915 | .904 | .892 | .881 | .869 | .858 | .847 | .835 |
| 85 | 1.215 | .976 | .965 | .953 | .942 | .930 | .919 | .908 | .896 | .885 | .873 |
| 86 | .254 | 1.015 | 1.004 | .992 | .981 | .970 | .958 | .947 | .935 | .924 | .913 |
| 87 | .295 | .056 | .044 | 1.033 | 1.021 | 1.010 | .999 | .987 | .976 | .964 | .953 |
| 88 | .336 | .097 | .086 | .074 | .063 | .051 | 1.040 | 1.029 | 1.017 | 1.006 | .994 |
| 89 | .379 | .140 | .128 | .117 | .106 | .094 | .083 | .071 | .060 | .049 | 1.037 |
| 90 | 1.423 | 1.184 | 1.172 | 1.161 | 1.149 | 1.138 | 1.127 | 1.115 | 1.104 | 1.092 | 1.081 |
| 91 | .469 | .229 | .217 | .206 | .195 | .183 | .172 | .160 | .149 | .138 | .126 |
| 92 | .515 | .275 | .264 | .252 | .241 | .230 | .218 | .207 | .195 | .184 | .172 |
| 93 | .563 | .323 | .311 | .300 | .288 | .277 | .266 | .254 | .243 | .231 | .220 |
| 94 | .612 | .372 | .360 | .349 | .337 | .326 | .315 | .303 | .292 | .280 | .269 |
| 95 | 1.662 | 1.422 | 1.411 | 1.399 | 1.388 | 1.376 | 1.365 | 1.353 | 1.342 | 1.330 | 1.319 |
| 96 | .714 | .474 | .462 | .451 | .439 | .428 | .416 | .405 | .393 | .382 | .371 |
| 97 | .767 | .527 | .515 | .504 | .492 | .481 | .469 | .458 | .446 | .435 | .423 |
| 98 | .822 | .581 | .570 | .558 | .547 | .535 | .524 | .512 | .501 | .489 | .478 |
| 99 | .878 | .637 | .625 | .614 | .602 | .591 | .580 | .568 | .557 | .545 | .534 |
| 100 | 1.936 | 1.694 | 1.683 | 1.671 | 1.660 | 1.648 | 1.637 | 1.625 | 1.614 | 1.602 | 1.591 |
| 101 | .994 | .753 | .742 | .730 | .719 | .707 | .696 | .684 | .673 | .661 | .650 |
| 102 | 2.055 | .813 | .802 | .790 | .779 | .767 | .756 | .744 | .733 | .721 | .710 |
| 103 | .117 | .875 | .864 | .852 | .841 | .829 | .818 | .806 | .795 | .783 | .772 |
| 104 | .181 | .939 | .928 | .916 | .905 | .893 | .882 | .870 | .858 | .847 | .835 |
| 105 | 2.246 | 2.004 | 1.993 | 1.981 | 1.970 | 1.958 | 1.947 | 1.935 | 1.924 | 1.912 | 1.901 |
| 106 | .314 | .071 | 2.060 | 2.048 | 2.037 | 2.025 | 2.014 | 2.002 | .991 | .979 | .968 |
| 107 | .382 | .140 | .129 | .117 | .105 | .094 | .082 | .071 | 2.059 | 2.048 | 2.036 |
| 108 | .453 | .211 | .199 | .187 | .176 | .164 | .153 | .141 | .130 | .118 | .107 |
| 109 | .525 | .283 | .271 | .260 | .248 | .236 | .225 | .213 | .202 | .190 | .179 |
| 110 | 2.599 | 2.357 | 2.345 | 2.334 | 2.322 | 2.310 | 2.299 | 2.287 | 2.276 | 2.264 | 2.253 |
| 110 | $\Delta e \times \Delta B$ | +.0081 | +.0085 | +.0089 | +.0092 | +.0096 | +.0100 | +.0104 | +.0108 | +.0112 | +.0116 |

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B\,(t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.00$

| $t'$ | $t-t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 60° | $\Delta e \times \Delta B$ | +.0116 | +.0120 | +.0123 | +.0127 | +.0131 | +.0134 | +.0138 | +.0142 | +.0146 | +.0149 |
| 60° | 0.522 | 0.175 | 0.163 | 0.152 | 0.141 | 0.130 | 0.119 | 0.107 | 0.096 | 0.085 | 0.074 |
| 61 | .541 | .193 | .182 | .171 | .160 | .148 | .137 | .126 | .115 | .104 | .092 |
| 62 | .560 | .213 | .201 | .190 | .179 | .168 | .156 | .145 | .134 | .123 | .112 |
| 63 | .580 | .232 | .221 | .210 | .199 | .188 | .176 | .165 | .154 | .143 | .131 |
| 64 | .601 | .253 | .242 | .231 | .219 | .208 | .197 | .186 | .174 | .163 | .152 |
| 65 | .623 | .274 | .263 | .252 | .240 | .229 | .218 | .207 | .195 | .184 | .173 |
| 66 | .645 | .296 | .285 | .274 | .262 | .251 | .240 | .229 | .217 | .206 | .195 |
| 67 | .667 | .318 | .307 | .296 | .285 | .273 | .262 | .251 | .240 | .228 | .217 |
| 68 | .691 | .342 | .330 | .319 | .308 | .297 | .285 | .274 | .263 | .252 | .240 |
| 69 | .715 | .366 | .354 | .343 | .332 | .321 | .309 | .298 | .287 | .275 | .264 |
| 70 | .740 | .390 | .379 | .368 | .357 | .345 | .334 | .323 | .311 | .300 | .289 |
| 71 | .766 | .416 | .404 | .393 | .382 | .371 | .359 | .348 | .337 | .325 | .314 |
| 72 | .792 | .442 | .431 | .419 | .408 | .397 | .385 | .374 | .363 | .352 | .340 |
| 73 | .819 | .469 | .458 | .446 | .435 | .424 | .412 | .401 | .390 | .379 | .367 |
| 74 | .847 | .496 | .485 | .474 | .463 | .451 | .440 | .429 | .418 | .406 | .395 |
| 75 | .876 | .525 | .514 | .503 | .491 | .480 | .469 | .457 | .446 | .435 | .424 |
| 76 | .906 | .555 | .543 | .532 | .521 | .509 | .498 | .487 | .476 | .464 | .453 |
| 77 | .936 | .585 | .574 | .562 | .551 | .540 | .529 | .517 | .506 | .495 | .483 |
| 78 | .968 | .616 | .605 | .594 | .582 | .571 | .560 | .548 | .537 | .526 | .514 |
| 79 | 1.000 | .649 | .637 | .626 | .615 | .603 | .592 | .581 | .569 | .558 | .547 |
| 80 | 1.033 | .682 | .670 | .659 | .648 | .636 | .625 | .614 | .602 | .591 | .580 |
| 81 | .068 | .716 | .704 | .693 | .682 | .670 | .659 | .648 | .636 | .625 | .613 |
| 82 | .103 | .751 | .739 | .728 | .717 | .705 | .694 | .683 | .671 | .660 | .648 |
| 83 | .139 | .787 | .775 | .764 | .753 | .741 | .730 | .719 | .707 | .696 | .685 |
| 84 | .176 | .824 | .813 | .801 | .790 | .778 | .767 | .756 | .744 | .733 | .722 |
| 85 | 1.215 | .862 | .851 | .839 | .828 | .817 | .805 | .794 | .782 | .771 | .760 |
| 86 | .254 | .901 | .890 | .878 | .867 | .856 | .844 | .833 | .822 | .810 | .799 |
| 87 | .295 | .942 | .930 | .919 | .907 | .896 | .885 | .873 | .862 | .850 | .839 |
| 88 | .336 | .983 | .972 | .960 | .949 | .937 | .926 | .915 | .903 | .892 | .880 |
| 89 | .379 | 1.026 | 1.014 | 1.003 | .991 | .980 | .969 | .957 | .946 | .934 | .923 |
| 90 | 1.423 | 1.069 | 1.058 | 1.047 | 1.035 | 1.024 | 1.012 | 1.001 | .990 | .978 | .967 |
| 91 | .469 | .115 | .103 | .092 | .080 | .069 | .058 | .046 | 1.035 | 1.023 | 1.012 |
| 92 | .515 | .161 | .150 | .138 | .127 | .115 | .104 | .092 | .081 | .070 | .058 |
| 93 | .563 | .208 | .197 | .186 | .174 | .163 | .151 | .140 | .128 | .117 | .105 |
| 94 | .612 | .257 | .246 | .234 | .223 | .212 | .200 | .189 | .177 | .166 | .154 |
| 95 | 1.662 | 1.308 | 1.296 | 1.285 | 1.273 | 1.262 | 1.250 | 1.239 | 1.227 | 1.216 | 1.204 |
| 96 | .714 | .359 | .348 | .336 | .325 | .313 | .302 | .290 | .279 | .267 | .256 |
| 97 | .767 | .412 | .401 | .389 | .378 | .366 | .355 | .343 | .332 | .320 | .309 |
| 98 | .822 | .466 | .455 | .443 | .432 | .420 | .409 | .398 | .386 | .375 | .363 |
| 99 | .878 | .522 | .511 | .499 | .488 | .476 | .465 | .453 | .442 | .430 | .419 |
| 100 | 1.936 | 1.579 | 1.568 | 1.556 | 1.545 | 1.533 | 1.522 | 1.510 | 1.499 | 1.488 | 1.476 |
| 101 | .994 | .638 | .627 | .615 | .604 | .592 | .581 | .569 | .558 | .546 | .535 |
| 102 | 2.055 | .698 | .687 | .675 | .664 | .652 | .641 | .629 | .618 | .606 | .595 |
| 103 | .117 | .760 | .749 | .737 | .726 | .714 | .703 | .691 | .680 | .668 | .657 |
| 104 | .181 | .824 | .812 | .801 | .789 | .778 | .766 | .755 | .743 | .732 | .720 |
| 105 | 2.246 | 1.889 | 1.878 | 1.866 | 1.855 | 1.843 | 1.832 | 1.820 | 1.808 | 1.797 | 1.785 |
| 106 | .314 | .956 | .945 | .933 | .922 | .910 | .898 | .887 | .875 | .864 | .852 |
| 107 | .382 | 2.025 | 2.013 | 2.002 | .990 | .979 | .967 | .955 | .944 | .932 | .921 |
| 108 | .453 | .095 | .084 | .072 | 2.060 | 2.049 | 2.037 | 2.026 | 2.014 | 2.003 | .991 |
| 109 | 2.525 | 2.167 | 2.156 | 2.144 | 2.133 | 2.121 | 2.109 | 2.098 | 2.086 | 2.075 | 2.063 |
| 110 | $\Delta e \times \Delta B$ | +.0119 | +.0123 | +.0127 | +.0131 | +.0135 | +.0139 | +.0143 | +.0146 | +.0150 | +.0154 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B\,(t - t')\left(1 + \frac{t' - 32}{1571}\right)$

$B = 30.00$

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| F. 60° | Inches. $\Delta e \times \Delta B$ | Inches. +.0153 | Inches. +.0157 | Inches. +.0161 | Inches. +.0164 | Inches. +.0168 | Inches. +.0172 | Inches. +.0176 | Inches. +.0179 | Inches. +.0183 | Inches. +.0187 |
| 60° | 0.522 | 0.063 | 0.051 | 0.040 | 0.029 | 0.018 | 0.007 | | | | |
| 61 | .541 | .081 | .070 | .059 | .048 | .036 | .025 | 0.014 | 0.003 | | |
| 62 | .560 | .100 | .089 | .078 | .067 | .055 | .044 | .033 | .022 | 0.011 | |
| 63 | .580 | .120 | .109 | .098 | .087 | .075 | .064 | .053 | .042 | .030 | 0.019 |
| 64 | .601 | .141 | .129 | .118 | .107 | .096 | .085 | .073 | .062 | .051 | .040 |
| 65 | .623 | .162 | .150 | .139 | .128 | .117 | .105 | .094 | .083 | .072 | .061 |
| 66 | .645 | .184 | .172 | .161 | .150 | .139 | .127 | .116 | .105 | .094 | .082 |
| 67 | .667 | .206 | .195 | .183 | .172 | .161 | .150 | .138 | .127 | .116 | .105 |
| 68 | .691 | .229 | .218 | .207 | .195 | .184 | .173 | .162 | .150 | .139 | .128 |
| 69 | .715 | .253 | .242 | .230 | .219 | .208 | .197 | .185 | .174 | .163 | .152 |
| 70 | .740 | .278 | .266 | .255 | .244 | .232 | .221 | .210 | .199 | .187 | .176 |
| 71 | .766 | .303 | .292 | .280 | .269 | .258 | .246 | .235 | .224 | .213 | .201 |
| 72 | .792 | .329 | .318 | .306 | .295 | .284 | .273 | .261 | .250 | .239 | .227 |
| 73 | .819 | .356 | .345 | .333 | .322 | .311 | .299 | .288 | .277 | .266 | .254 |
| 74 | .847 | .384 | .372 | .361 | .350 | .338 | .327 | .316 | .304 | .293 | .282 |
| 75 | .876 | .412 | .401 | .390 | .378 | .367 | .356 | .344 | .333 | .322 | .310 |
| 76 | .906 | .442 | .430 | .419 | .408 | .396 | .385 | .374 | .362 | .351 | .340 |
| 77 | .936 | .472 | .461 | .449 | .438 | .427 | .415 | .404 | .393 | .381 | .370 |
| 78 | .968 | .503 | .492 | .480 | .469 | .458 | .446 | .435 | .424 | .412 | .401 |
| 79 | 1.000 | .535 | .524 | .513 | .501 | .490 | .478 | .467 | .456 | .444 | .433 |
| 80 | 1.033 | .568 | .557 | .546 | .534 | .523 | .511 | .500 | .489 | .477 | .466 |
| 81 | .068 | .602 | .591 | .579 | .568 | .557 | .545 | .534 | .523 | .511 | .500 |
| 82 | .103 | .637 | .626 | .614 | .603 | .592 | .580 | .569 | .558 | .546 | .535 |
| 83 | .139 | .673 | .662 | .650 | .639 | .628 | .616 | .605 | .594 | .582 | .571 |
| 84 | .176 | .710 | .699 | .687 | .676 | .665 | .653 | .642 | .631 | .619 | .608 |
| 85 | 1.215 | .748 | .737 | .725 | .714 | .703 | .691 | .680 | .669 | .657 | .646 |
| 86 | .254 | .787 | .776 | .765 | .753 | .742 | .730 | .719 | .708 | .696 | .685 |
| 87 | .295 | .828 | .816 | .805 | .793 | .782 | .771 | .759 | .748 | .737 | .725 |
| 88 | .336 | .869 | .858 | .846 | .835 | .823 | .812 | .801 | .789 | .778 | .766 |
| 89 | .379 | .912 | .900 | .889 | .877 | .866 | .855 | .843 | .832 | .820 | .809 |
| 90 | 1.423 | .955 | .944 | .932 | .921 | .910 | .898 | .887 | .875 | .864 | .853 |
| 91 | .469 | 1.000 | .989 | .978 | .966 | .955 | .943 | .932 | .920 | .909 | .898 |
| 92 | .515 | .047 | 1.035 | 1.024 | 1.012 | 1.001 | .989 | .978 | .967 | .955 | .944 |
| 93 | .563 | .094 | .083 | .071 | .060 | .048 | 1.037 | 1.025 | 1.014 | 1.003 | .991 |
| 94 | .612 | .143 | .131 | .120 | .109 | .097 | .086 | .074 | .063 | .051 | 1.040 |
| 95 | 1.662 | 1.193 | 1.182 | 1.170 | 1.159 | 1.147 | 1.136 | 1.124 | 1.113 | 1.101 | 1.090 |
| 96 | .714 | .244 | .233 | .222 | .210 | .199 | .187 | .176 | .164 | .153 | .141 |
| 97 | .767 | .297 | .286 | .274 | .263 | .251 | .240 | .229 | .217 | .206 | .194 |
| 98 | .822 | .352 | .340 | .329 | .317 | .306 | .294 | .283 | .271 | .260 | .248 |
| 99 | 1.878 | 1.407 | 1.396 | 1.384 | 1.373 | 1.361 | 1.350 | 1.338 | 1.327 | 1.316 | 1.304 |
| 100 | $\Delta e \times \Delta B$ | +.0157 | +.0161 | +.0165 | +.0168 | +.0172 | +.0176 | +0.180 | +.0184 | +.0188 | +.0191 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### ENGLISH MEASURES.

Values of $e = e' - 0.000367\,B\,(t-t')\left(1 + \frac{t'-32}{1571}\right)$

$B = 30.00$

| $t'$ | $t-t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| F. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| 70° | $\Delta e \times \Delta B$ | +.0192 | +.0195 | +.0199 | +.0203 | +.0207 | +.0210 | +.0214 | +.0218 | +.0222 | +.0226 |
| 62° | 0.560 | | | | | | | | | | |
| 63 | .580 | 0.008 | | | | | | | | | |
| 64 | .601 | 0.028 | 0.017 | 0.006 | | | | | | | |
| 65 | .623 | .049 | .038 | .027 | 0.016 | 0.004 | | | | | |
| 66 | .645 | .071 | .060 | .049 | .037 | .026 | 0.015 | 0.004 | | | |
| 67 | .667 | .093 | .082 | .071 | .060 | .048 | .037 | .026 | 0.015 | 0.003 | |
| 68 | .691 | .116 | .105 | .094 | .083 | .071 | .060 | .049 | .038 | .026 | 0.015 |
| 69 | .715 | .140 | .129 | .118 | .106 | .095 | .084 | .073 | .061 | .050 | .039 |
| 70 | .740 | .165 | .154 | .142 | .131 | .120 | .108 | .097 | .086 | .075 | .063 |
| 71 | .766 | .190 | .179 | .167 | .156 | .145 | .134 | .122 | .111 | .100 | .089 |
| 72 | .792 | .216 | .205 | .194 | .182 | .171 | .160 | .148 | .137 | .126 | .114 |
| 73 | .819 | .243 | .232 | .220 | .209 | .198 | .186 | .175 | .164 | .153 | .141 |
| 74 | .847 | .271 | .259 | .248 | .237 | .225 | .214 | .203 | .191 | .180 | .169 |
| 75 | .876 | .299 | .288 | .276 | .265 | .254 | .243 | .231 | .220 | .209 | .197 |
| 76 | .906 | .328 | .317 | .306 | .294 | .283 | .272 | .260 | .249 | .238 | .226 |
| 77 | .936 | .359 | .347 | .336 | .325 | .313 | .302 | .291 | .279 | .268 | .257 |
| 78 | .968 | .390 | .378 | .367 | .356 | .344 | .333 | .322 | .310 | .299 | .288 |
| 79 | 1.000 | .422 | .410 | .399 | .388 | .376 | .365 | .354 | .342 | .331 | .320 |
| 80 | 1.033 | .455 | .443 | .432 | .421 | .409 | .398 | .387 | .375 | .364 | .353 |
| 81 | .068 | .489 | .477 | .466 | .455 | .443 | .432 | .420 | .409 | .398 | .386 |
| 82 | .103 | .524 | .512 | .501 | .489 | .478 | .467 | .455 | .444 | .433 | .421 |
| 83 | .139 | .559 | .548 | .537 | .525 | .514 | .503 | .491 | .480 | .469 | .457 |
| 84 | .176 | .596 | .585 | .574 | .562 | .551 | .540 | .528 | .517 | .505 | .494 |
| 85 | 1.215 | .634 | .623 | .612 | .600 | .589 | .578 | .566 | .555 | .543 | .532 |
| 86 | .254 | .673 | .662 | .651 | .639 | .628 | .617 | .605 | .594 | .582 | .571 |
| 87 | .295 | .714 | .702 | .691 | .680 | .668 | .657 | .645 | .634 | .623 | .611 |
| 88 | .336 | .755 | .744 | .732 | .721 | .709 | .698 | .687 | .675 | .664 | .652 |
| 89 | 1.379 | 0.798 | 0.786 | 0.775 | 0.763 | 0.752 | 0.740 | 0.729 | 0.718 | 0.706 | 0.695 |
| 90 | $\Delta e \times \Delta B$ | +.0194 | +.0198 | +.0202 | +.0205 | +.0209 | +.0213 | +.0217 | +.0221 | +.0225 | +.0228 |

# RELATIVE HUMIDITY.

## TEMPERATURES FAHRENHEIT.

| Air Temperature. | RELATIVE HUMIDITY, OR PERCENTAGE OF SATURATION. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| F. | Vapor pressure (inches). | | | | | | | | | |
| −30° | 0.0007 | 0.0014 | 0.0021 | 0.0028 | 0.0035 | 0.0042 | 0.0049 | 0.0056 | 0.0063 | 0.0071 |
| 29 | .0007 | .0015 | .0022 | .0030 | .0037 | .0045 | .0052 | .0060 | .0067 | .0075 |
| 28 | .0008 | .0016 | .0024 | .0032 | .0040 | .0048 | .0056 | .0064 | .0072 | .0080 |
| 27 | .0008 | .0017 | .0025 | .0034 | .0042 | .0051 | .0059 | .0068 | .0076 | .0084 |
| 26 | .0009 | .0018 | .0027 | .0036 | .0045 | .0054 | .0063 | .0072 | .0081 | .0090 |
| −25 | 0.0010 | 0.0019 | 0.0029 | 0.0038 | 0.0048 | 0.0057 | 0.0067 | 0.0076 | 0.0086 | 0.0095 |
| 24 | .0010 | .0020 | .0030 | .0040 | .0050 | .0060 | .0071 | .0081 | .0091 | .0101 |
| 23 | .0011 | .0021 | .0032 | .0043 | .0053 | .0064 | .0075 | .0086 | .0096 | .0107 |
| 22 | .0011 | .0023 | .0034 | .0045 | .0057 | .0068 | .0079 | .0091 | .0102 | .0113 |
| 21 | .0012 | .0024 | .0036 | .0048 | .0060 | .0072 | .0084 | .0096 | .0108 | .0120 |
| −20 | 0.0013 | 0.0025 | 0.0038 | 0.0051 | 0.0064 | 0.0076 | 0.0089 | 0.0102 | 0.0114 | 0.0127 |
| 19 | .0013 | .0027 | .0040 | .0054 | .0067 | .0081 | .0094 | .0108 | .0121 | .0135 |
| 18 | .0014 | .0029 | .0043 | .0057 | .0071 | .0086 | .0100 | .0114 | .0128 | .0143 |
| 17 | .0015 | .0030 | .0045 | .0060 | .0076 | .0091 | .0106 | .0121 | .0136 | .0151 |
| 16 | .0016 | .0032 | .0048 | .0064 | .0080 | .0096 | .0112 | .0128 | .0144 | .0160 |
| −15 | 0.0017 | 0.0034 | 0.0051 | 0.0068 | 0.0084 | 0.0101 | 0.0118 | 0.0135 | 0.0152 | 0.0169 |
| 14 | .0018 | .0036 | .0054 | .0071 | .0089 | .0107 | .0125 | .0143 | .0161 | .0179 |
| 13 | .0019 | .0038 | .0057 | .0076 | .0094 | .0113 | .0132 | .0151 | .0170 | .0189 |
| 12 | .0020 | .0040 | .0060 | .0080 | .0100 | .0120 | .0140 | .0160 | .0180 | .0200 |
| 11 | .0021 | .0042 | .0063 | .0084 | .0106 | .0127 | .0148 | .0169 | .0190 | .0211 |
| −10 | 0.0022 | 0.0045 | 0.0067 | 0.0089 | 0.0112 | 0.0134 | 0.0156 | 0.0178 | 0.0201 | 0.0223 |
| 9 | .0024 | .0047 | .0071 | .0094 | .0118 | .0141 | .0165 | .0188 | .0212 | .0236 |
| 8 | .0025 | .0050 | .0075 | .0099 | .0124 | .0149 | .0174 | .0199 | .0224 | .0249 |
| 7 | .0026 | .0053 | .0079 | .0105 | .0131 | .0158 | .0184 | .0210 | .0236 | .0263 |
| 6 | .0028 | .0055 | .0083 | .0111 | .0139 | .0166 | .0194 | .0222 | .0249 | .0277 |
| − 5 | 0.0029 | 0.0058 | 0.0088 | 0.0117 | 0.0146 | 0.0175 | 0.0205 | 0.0234 | 0.0263 | 0.0292 |
| 4 | .0031 | .0062 | .0093 | .0123 | .0154 | .0185 | .0216 | .0247 | .0278 | .0308 |
| 3 | .0033 | .0065 | .0098 | .0130 | .0163 | .0195 | .0228 | .0260 | .0293 | .0325 |
| 2 | .0034 | .0069 | .0103 | .0137 | .0171 | .0206 | .0240 | .0274 | .0309 | .0343 |
| 1 | .0036 | .0072 | .0108 | .0145 | .0181 | .0217 | .0253 | .0289 | .0325 | .0361 |
| ±0 | 0.0038 | 0.0076 | 0.0114 | 0.0152 | 0.0190 | 0.0229 | 0.0267 | 0.0305 | 0.0343 | 0.0381 |
| 1 | .0040 | .0080 | .0120 | .0161 | .0201 | .0241 | .0281 | .0321 | .0361 | .0401 |
| 2 | .0042 | .0085 | .0127 | .0169 | .0211 | .0254 | .0296 | .0338 | .0380 | .0423 |
| 3 | .0044 | .0089 | .0134 | .0178 | .0222 | .0267 | .0312 | .0356 | .0400 | .0445 |
| 4 | .0047 | .0094 | .0141 | .0187 | .0234 | .0281 | .0328 | .0375 | .0422 | .0468 |
| 5 | 0.0049 | 0.0099 | 0.0148 | 0.0197 | 0.0247 | 0.0296 | 0.0345 | 0.0394 | 0.0444 | 0.0493 |
| 6 | .0052 | .0104 | .0156 | .0208 | .0259 | .0311 | .0363 | .0415 | .0467 | .0519 |
| 7 | .0055 | .0109 | .0164 | .0218 | .0273 | .0328 | .0382 | .0437 | .0491 | .0546 |
| 8 | .0057 | .0115 | .0172 | .0230 | .0287 | .0344 | .0402 | .0459 | .0517 | .0574 |
| 9 | .0060 | .0121 | .0181 | .0241 | .0302 | .0362 | .0423 | .0483 | .0543 | .0604 |
| 10 | 0.0063 | 0.0127 | 0.0190 | 0.0254 | 0.0317 | 0.0381 | 0.0444 | 0.0508 | 0.0571 | 0.0635 |
| 11 | .0067 | .0133 | .0200 | .0267 | .0334 | .0400 | .0467 | .0534 | .0600 | .0667 |
| 12 | .0070 | .0140 | .0210 | .0280 | .0350 | .0421 | .0491 | .0561 | .0631 | .0701 |
| 13 | .0074 | .0147 | .0221 | .0295 | .0368 | .0442 | .0515 | .0589 | .0663 | .0736 |
| 14 | .0077 | .0155 | .0232 | .0309 | .0387 | .0464 | .0541 | .0619 | .0696 | .0773 |
| 15 | 0.0081 | 0.0162 | 0.0244 | 0.0325 | 0.0406 | 0.0487 | 0.0568 | 0.0650 | 0.0731 | 0.0812 |
| 16 | .0085 | .0170 | .0256 | .0341 | .0426 | .0512 | .0597 | .0682 | .0767 | .0852 |
| 17 | .0089 | .0179 | .0268 | .0358 | .0447 | .0537 | .0626 | .0716 | .0805 | .0895 |
| 18 | .0094 | .0188 | .0282 | .0376 | .0470 | .0563 | .0657 | .0751 | .0845 | .0939 |
| 19 | .0099 | .0197 | .0296 | .0394 | .0493 | .0591 | .0690 | .0788 | .0887 | .0985 |
| 20 | 0.0103 | 0.0207 | 0.0310 | 0.0413 | 0.0517 | 0.0620 | 0.0723 | 0.0827 | 0.0930 | 0.1033 |

## RELATIVE HUMIDITY.

### TEMPERATURES FAHRENHEIT.

| Air Temperature. | RELATIVE HUMIDITY, OR PERCENTAGE OF SATURATION. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| F. | Vapor pressure (inches). | | | | | | | | | |
| 20° | 0.010 | 0.021 | 0.031 | 0.041 | 0.052 | 0.062 | 0.072 | 0.083 | 0.093 | 0.103 |
| 21 | .011 | .022 | .033 | .043 | .054 | .065 | .076 | .087 | .098 | .108 |
| 22 | .011 | .023 | .034 | .045 | .057 | .068 | .080 | .091 | .102 | .114 |
| 23 | .012 | .024 | .036 | .048 | .060 | .071 | .083 | .095 | .107 | .119 |
| 24 | .012 | .025 | .037 | .050 | .062 | .075 | .087 | .100 | .112 | .125 |
| 25 | 0.013 | 0.026 | 0.039 | 0.052 | 0.065 | 0.078 | 0.092 | 0.105 | 0.118 | 0.131 |
| 26 | .014 | .027 | .041 | .055 | .068 | .082 | .096 | .110 | .123 | .137 |
| 27 | .014 | .029 | .043 | .057 | .072 | .086 | .100 | .115 | .129 | .143 |
| 28 | .015 | .030 | .045 | .060 | .075 | .090 | .105 | .120 | .135 | .150 |
| 29 | .016 | .031 | .047 | .063 | .079 | .094 | .110 | .126 | .142 | .157 |
| 30 | 0.016 | 0.033 | 0.049 | 0.066 | 0.082 | 0.099 | 0.115 | 0.132 | 0.148 | 0.165 |
| 31 | .017 | .034 | .052 | .069 | .086 | .103 | .121 | .138 | .155 | .172 |
| 32 | .018 | .036 | .054 | .072 | .090 | .108 | .126 | .144 | .162 | .180 |
| 33 | .019 | .038 | .056 | .075 | .094 | .113 | .131 | .150 | .169 | .188 |
| 34 | .020 | .039 | .059 | .078 | .098 | .117 | .137 | .156 | .176 | .195 |
| 35 | 0.020 | 0.041 | 0.061 | 0.081 | 0.102 | 0.122 | 0.142 | 0.163 | 0.183 | 0.203 |
| 36 | .021 | .042 | .064 | .085 | .106 | .127 | .148 | .169 | .191 | .212 |
| 37 | .022 | .044 | .066 | .088 | .110 | .132 | .154 | .176 | .198 | .220 |
| 38 | .023 | .046 | .069 | .092 | .115 | .137 | .160 | .183 | .206 | .229 |
| 39 | .024 | .048 | .071 | .095 | .119 | .143 | .167 | .191 | .214 | .238 |
| 40 | 0.025 | 0.050 | 0.074 | 0.099 | 0.124 | 0.149 | 0.173 | 0.198 | 0.223 | 0.248 |
| 41 | .026 | .052 | .077 | .103 | .129 | .155 | .180 | .206 | .232 | .258 |
| 42 | .027 | .054 | .080 | .107 | .134 | .161 | .187 | .214 | .241 | .268 |
| 43 | .028 | .056 | .083 | .111 | .139 | .167 | .195 | .223 | .250 | .278 |
| 44 | .029 | .058 | .087 | .116 | .145 | .173 | .202 | .231 | .260 | .289 |
| 45 | 0.030 | 0.060 | 0.090 | 0.120 | 0.150 | 0.180 | 0.210 | 0.240 | 0.270 | 0.300 |
| 46 | .031 | .062 | .094 | .125 | .156 | .187 | .218 | .250 | .281 | .312 |
| 47 | .032 | .065 | .097 | .130 | .162 | .194 | .227 | .259 | .292 | .324 |
| 48 | .034 | .067 | .101 | .135 | .168 | .202 | .236 | .269 | .303 | .336 |
| 49 | .035 | .070 | .105 | .140 | .175 | .210 | .245 | .279 | .314 | .349 |
| 50 | 0.036 | 0.073 | 0.109 | 0.145 | 0.181 | 0.218 | 0.254 | 0.290 | 0.326 | 0.363 |
| 51 | .038 | .075 | .113 | .151 | .188 | .226 | .263 | .301 | .339 | .376 |
| 52 | .039 | .078 | .117 | .156 | .195 | .234 | .273 | .312 | .351 | .390 |
| 53 | .041 | .081 | .122 | .162 | .203 | .243 | .284 | .324 | .365 | .405 |
| 54 | .042 | .084 | .126 | .168 | .210 | .252 | .294 | .336 | .378 | .420 |
| 55 | 0.044 | 0.087 | 0.131 | 0.174 | 0.218 | 0.262 | 0.305 | 0.349 | 0.392 | 0.436 |
| 56 | .045 | .090 | .136 | .181 | .226 | .271 | .316 | .362 | .407 | .452 |
| 57 | .047 | .094 | .141 | .187 | .234 | .281 | .328 | .375 | .422 | .469 |
| 58 | .049 | .097 | .146 | .194 | .243 | .292 | .340 | .389 | .437 | .486 |
| 59 | .050 | .101 | .151 | .201 | .252 | .302 | .353 | .403 | .453 | .504 |
| 60 | 0.052 | 0.104 | 0.157 | 0.209 | 0.261 | 0.313 | 0.365 | 0.418 | 0.470 | 0.522 |
| 61 | .054 | .108 | .162 | .216 | .270 | .325 | .379 | .433 | .487 | .541 |
| 62 | .056 | .112 | .168 | .224 | .280 | .336 | .392 | .448 | .504 | .560 |
| 63 | .058 | .116 | .174 | .232 | .290 | .348 | .406 | .464 | .522 | .580 |
| 64 | .060 | .120 | .180 | .241 | .301 | .361 | .421 | .481 | .541 | .601 |
| 65 | 0.062 | 0.125 | 0.187 | 0.249 | 0.311 | 0.374 | 0.436 | 0.498 | 0.560 | 0.623 |
| 66 | .064 | .129 | .193 | .258 | .322 | .387 | .451 | .516 | .580 | .645 |
| 67 | .067 | .133 | .200 | .267 | .334 | .400 | .467 | .534 | .601 | .667 |
| 68 | .069 | .138 | .207 | .276 | .345 | .415 | .484 | .553 | .622 | .691 |
| 69 | .072 | .143 | .214 | .286 | .358 | .429 | .500 | .572 | .644 | .715 |
| 70 | 0.074 | 0.148 | 0.222 | 0.296 | 0.370 | 0.444 | 0.518 | 0.592 | 0.666 | 0.740 |

# RELATIVE HUMIDITY.

## TEMPERATURES FAHRENHEIT.

| Air Temperature. | RELATIVE HUMIDITY, OR PERCENTAGE OF SATURATION. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| F. | Vapor pressure (inches). | | | | | | | | | |
| 70° | 0.074 | 0.148 | 0.222 | 0.296 | 0.370 | 0.444 | 0.518 | 0.592 | 0.666 | 0.740 |
| 71 | .077 | .153 | .230 | .306 | .383 | .459 | .536 | .612 | .689 | .766 |
| 72 | .079 | .158 | .238 | .317 | .396 | .475 | .554 | .634 | .713 | .792 |
| 73 | .082 | .164 | .246 | .328 | .410 | .491 | .573 | .655 | .737 | .819 |
| 74 | .085 | .169 | .254 | .339 | .424 | .508 | .593 | .678 | .762 | .847 |
| 75 | 0.088 | 0.175 | 0.263 | 0.350 | 0.438 | 0.526 | 0.613 | 0.701 | 0.788 | 0.876 |
| 76 | .091 | .181 | .272 | .362 | .453 | .543 | .634 | .724 | .815 | .906 |
| 77 | .094 | .187 | .281 | .374 | .468 | .562 | .655 | .749 | .843 | .936 |
| 78 | .097 | .194 | .290 | .387 | .484 | .581 | .677 | .774 | .871 | .968 |
| 79 | .100 | .200 | .300 | .400 | .500 | .600 | .700 | .800 | .900 | 1.000 |
| 80 | 0.103 | 0.207 | 0.310 | 0.413 | 0.517 | 0.620 | 0.723 | 0.827 | 0.930 | 1.033 |
| 81 | .107 | .214 | .320 | .427 | .534 | .641 | .747 | .854 | .961 | 1.068 |
| 82 | .110 | .221 | .331 | .441 | .551 | .662 | .772 | .882 | .993 | 1.103 |
| 83 | .114 | .228 | .342 | .456 | .570 | .684 | .797 | .911 | 1.025 | 1.139 |
| 84 | .118 | .235 | .353 | .471 | .588 | .706 | .824 | .941 | 1.059 | 1.176 |
| 85 | 0.121 | 0.243 | 0.364 | 0.486 | 0.607 | 0.729 | 0.850 | 0.972 | 1.093 | 1.215 |
| 86 | .125 | .251 | .376 | .502 | .627 | .753 | .878 | 1.003 | 1.129 | 1.254 |
| 87 | .129 | .259 | .388 | .518 | .647 | .777 | .906 | 1.036 | 1.165 | 1.295 |
| 88 | .134 | .267 | .401 | .535 | .668 | .802 | .936 | 1.069 | 1.203 | 1.336 |
| 89 | .138 | .276 | .414 | .552 | .690 | .828 | .966 | 1.104 | 1.241 | 1.379 |
| 90 | 0.142 | 0.285 | 0.427 | 0.569 | 0.712 | 0.854 | 0.996 | 1.139 | 1.281 | 1.423 |
| 91 | .147 | .294 | .441 | .588 | .734 | .881 | 1.028 | 1.175 | 1.322 | 1.469 |
| 92 | .152 | .303 | .455 | .606 | .758 | .909 | 1.061 | 1.212 | 1.364 | 1.515 |
| 93 | .156 | .313 | .469 | .625 | .782 | .938 | 1.094 | 1.250 | 1.407 | 1.563 |
| 94 | .161 | .322 | .484 | .645 | .806 | .967 | 1.128 | 1.290 | 1.451 | 1.612 |
| 95 | 0.166 | 0.332 | 0.499 | 0.665 | 0.831 | 0.998 | 1.164 | 1.330 | 1.496 | 1.662 |
| 96 | .171 | .343 | .514 | .686 | .857 | 1.029 | 1.200 | 1.371 | 1.543 | 1.714 |
| 97 | .177 | .353 | .530 | .707 | .884 | 1.060 | 1.237 | 1.414 | 1.591 | 1.767 |
| 98 | .182 | .364 | .547 | .729 | .911 | 1.093 | 1.275 | 1.458 | 1.640 | 1.822 |
| 99 | .188 | .376 | .563 | .751 | .939 | 1.127 | 1.315 | 1.502 | 1.690 | 1.878 |
| 100 | 0.194 | 0.387 | 0.581 | 0.774 | 0.968 | 1.161 | 1.355 | 1.548 | 1.742 | 1.936 |
| 101 | .199 | .399 | .598 | .798 | .997 | 1.197 | 1.396 | 1.596 | 1.795 | 1.994 |
| 102 | .206 | .411 | .616 | .822 | 1.028 | 1.233 | 1.438 | 1.644 | 1.850 | 2.055 |
| 103 | .212 | .423 | .635 | .847 | 1.059 | 1.270 | 1.482 | 1.694 | 1.905 | 2.117 |
| 104 | .218 | .436 | .654 | .872 | 1.090 | 1.309 | 1.527 | 1.745 | 1.963 | 2.181 |
| 105 | 0.225 | 0.449 | 0.674 | 0.899 | 1.123 | 1.348 | 1.572 | 1.797 | 2.022 | 2.246 |
| 106 | .231 | .463 | .694 | .925 | 1.157 | 1.388 | 1.619 | 1.851 | 2.082 | 2.314 |
| 107 | .238 | .476 | .715 | .953 | 1.191 | 1.429 | 1.668 | 1.906 | 2.144 | 2.382 |
| 108 | .245 | .491 | .736 | .981 | 1.226 | 1.472 | 1.717 | 1.962 | 2.208 | 2.453 |
| 109 | .253 | .505 | .758 | 1.010 | 1.263 | 1.515 | 1.768 | 2.020 | 2.273 | 2.525 |
| 110 | 0.260 | 0.520 | 0.780 | 1.040 | 1.300 | 1.560 | 1.820 | 2.080 | 2.339 | 2.599 |
| 111 | .268 | .535 | .803 | 1.070 | 1.338 | 1.605 | 1.873 | 2.140 | 2.408 | 2.676 |
| 112 | .275 | .551 | .826 | 1.101 | 1.377 | 1.652 | 1.927 | 2.203 | 2.478 | 2.754 |
| 113 | .283 | .567 | .850 | 1.133 | 1.417 | 1.700 | 1.983 | 2.267 | 2.550 | 2.833 |
| 114 | .292 | .583 | .875 | 1.166 | 1.458 | 1.749 | 2.041 | 2.332 | 2.624 | 2.915 |
| 115 | 0.300 | 0.600 | 0.900 | 1.200 | 1.500 | 1.800 | 2.100 | 2.399 | 2.699 | 2.999 |
| 116 | .309 | .617 | .926 | 1.234 | 1.543 | 1.851 | 2.160 | 2.468 | 2.777 | 3.085 |
| 117 | .317 | .635 | .952 | 1.269 | 1.587 | 1.904 | 2.221 | 2.539 | 2.856 | 3.173 |
| 118 | .326 | .653 | .979 | 1.305 | 1.632 | 1.958 | 2.285 | 2.611 | 2.937 | 3.264 |
| 119 | .336 | .671 | 1.007 | 1.342 | 1.678 | 2.014 | 2.349 | 2.685 | 3.021 | 3.356 |
| 120 | 0.345 | 0.690 | 1.035 | 1.380 | 1.725 | 2.071 | 2.416 | 2.761 | 3.106 | 3.451 |

# REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

## METRIC MEASURES.

Values of $e = e' - 0.000660\ B\ (t - t')\ (1 + 0.00115\ t')$

| Temperature. | PRESSURE OF AQUEOUS VAPOR, $e$. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −50° | 0.029 | 0.026 | 0.023 | 0.020 | 0.017 | 0.015 | 0.013 | 0.012 | 0.010 | 0.009 |
| 40 | 0.096 | 0.086 | 0.076 | 0.068 | 0.060 | 0.054 | 0.048 | 0.042 | 0.037 | 0.033 |
| 30 | 0.288 | 0.259 | 0.233 | 0.209 | 0.188 | 0.169 | 0.151 | 0.135 | 0.121 | 0.108 |

$$e = e' - 0.000660\ B\ (t - t')\ (1 + 0.00115\ t')$$

$$B = 760 \text{ mm.}$$

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | .0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 1.0 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −30° | $\Delta e \times \Delta B$ | +0.006 | +0.013 | +0.019 | +0.025 | +0.032 | +0.038 | +0.045 | +0.051 | +0.057 | +0.064 |
| −30° | 0.288 | 0.239 | 0.191 | 0.143 | 0.094 | 0.046 | | | | | |
| 29 | .319 | .271 | .222 | .174 | .125 | .077 | 0.028 | | | | |
| 28 | .354 | .306 | .257 | .208 | .160 | .111 | .063 | 0.014 | | | |
| 27 | .392 | .344 | .295 | .246 | .198 | .149 | .101 | .052 | 0.003 | | |
| 26 | .434 | .385 | .337 | .288 | .239 | .191 | .142 | .093 | .045 | | |
| −25 | 0.480 | 0.431 | 0.383 | 0.334 | 0.285 | 0.236 | 0.188 | 0.139 | 0.090 | 0.042 | |
| 24 | .530 | .482 | .433 | .384 | .335 | .286 | .238 | .189 | .140 | .091 | 0.043 |
| 23 | .585 | .537 | .488 | .439 | .390 | .341 | .292 | .244 | .195 | .146 | .097 |
| 22 | .646 | .597 | .548 | .499 | .450 | .401 | .352 | .303 | .254 | .206 | .157 |
| 21 | .712 | .663 | .614 | .565 | .516 | .467 | .418 | .369 | .320 | .271 | .222 |
| −20 | 0.783 | 0.734 | 0.685 | 0.636 | 0.587 | 0.538 | 0.489 | 0.440 | 0.391 | 0.342 | 0.293 |
| 19 | .862 | .813 | .764 | .715 | .666 | .616 | .567 | .518 | .469 | .420 | .371 |
| 18 | .947 | .898 | .849 | .800 | .751 | .702 | .653 | .604 | .554 | .505 | .456 |
| 17 | 1.041 | .991 | .942 | .893 | .844 | .795 | .746 | .696 | .647 | .598 | .549 |
| 16 | 1.142 | 1.093 | 1.044 | .994 | .945 | .896 | .847 | .797 | .748 | .699 | .650 |
| −15 | 1.252 | 1.203 | 1.154 | 1.105 | 1.055 | 1.006 | 0.957 | 0.907 | 0.858 | 0.809 | 0.760 |
| 14 | 1.373 | 1.323 | 1.274 | 1.225 | 1.175 | 1.126 | 1.076 | 1.027 | .978 | .928 | .879 |
| 13 | 1.503 | 1.453 | 1.404 | 1.355 | 1.305 | 1.256 | 1.206 | 1.157 | 1.108 | 1.058 | 1.009 |
| 12 | 1.644 | 1.595 | 1.545 | 1.496 | 1.447 | 1.397 | 1.348 | 1.298 | 1.249 | 1.199 | 1.150 |
| 11 | 1.798 | 1.748 | 1.699 | 1.649 | 1.600 | 1.550 | 1.501 | 1.451 | 1.402 | 1.352 | 1.303 |
| −10 | 1.964 | 1.915 | 1.865 | 1.816 | 1.766 | 1.716 | 1.667 | 1.617 | 1.568 | 1.518 | 1.468 |
| 9 | 2.144 | 2.095 | 2.045 | 1.996 | 1.946 | 1.896 | 1.847 | 1.797 | 1.747 | 1.698 | 1.648 |
| 8 | 2.340 | 2.290 | 2.240 | 2.190 | 2.141 | 2.091 | 2.041 | 1.992 | 1.942 | 1.892 | 1.843 |
| 7 | 2.550 | 2.501 | 2.451 | 2.401 | 2.351 | 2.302 | 2.252 | 2.202 | 2.152 | 2.103 | 2.053 |
| 6 | 2.778 | 2.729 | 2.679 | 2.629 | 2.579 | 2.529 | 2.480 | 2.430 | 2.380 | 2.330 | 2.280 |
| −5 | 3.025 | 2.975 | 2.925 | 2.875 | 2.825 | 2.775 | 2.726 | 2.676 | 2.626 | 2.576 | 2.526 |
| −5 | $\Delta e \times \Delta B$ | +0.007 | +0.013 | +0.020 | +0.026 | +0.033 | +0.039 | +0.046 | +0.052 | +0.059 | +0.066 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### METRIC MEASURES.

Values of $e = e' - 0.000660\,B\,(t - t')\,(1 + 0.00115\,t')$

$B = 760$ mm.

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −20° | $\Delta e \times \Delta B$ | +0.071 | +0.077 | +0.084 | +0.090 | +0.097 | +0.103 | +0.110 | +0.116 | +0.123 | +0.129 |
| −25° | 0.480 | | | | | | | | | | |
| 24 | .530 | | | | | | | | | | |
| 23 | .585 | 0.048 | | | | | | | | | |
| 22 | .646 | .108 | 0.059 | 0.010 | | | | | | | |
| 21 | .712 | .173 | .124 | .075 | 0.026 | | | | | | |
| −20 | .783 | .244 | .195 | .146 | .097 | 0.048 | | | | | |
| 19 | .862 | .322 | .273 | .224 | .175 | .126 | 0.077 | 0.028 | | | |
| 18 | .947 | .407 | .358 | .309 | .260 | .211 | .161 | .112 | 0.063 | 0.014 | |
| 17 | 1.041 | .500 | .450 | .401 | .352 | .303 | .254 | .205 | .155 | .106 | 0.057 |
| 16 | 1.142 | .600 | .551 | .502 | .453 | .404 | .354 | .305 | .256 | .207 | .157 |
| −15 | 1.252 | .710 | .661 | .612 | .562 | .513 | .464 | .414 | .365 | .316 | .267 |
| 14 | 1.373 | .830 | .780 | .731 | .682 | .632 | .583 | .534 | .484 | .435 | .386 |
| 13 | 1.503 | .959 | .910 | .861 | .811 | .762 | .712 | .663 | .614 | .564 | .515 |
| 12 | 1.644 | 1.100 | 1.051 | 1.001 | .952 | .902 | .853 | .803 | .754 | .705 | .655 |
| 11 | 1.798 | 1.253 | 1.204 | 1.154 | 1.105 | 1.055 | 1.005 | .956 | .906 | .857 | .807 |
| −10 | +1.964 | 1.419 | 1.369 | 1.320 | 1.270 | 1.221 | 1.171 | 1.121 | 1.072 | 1.022 | .973 |
| 9 | 2.144 | 1.598 | 1.549 | 1.499 | 1.450 | 1.400 | 1.350 | 1.301 | 1.251 | 1.201 | 1.152 |
| 8 | 2.340 | 1.793 | 1.743 | 1.693 | 1.644 | 1.594 | 1.544 | 1.495 | 1.445 | 1.395 | 1.346 |
| 7 | 2.550 | 2.003 | 1.953 | 1.904 | 1.854 | 1.804 | 1.754 | 1.705 | 1.655 | 1.605 | 1.555 |
| 6 | 2.778 | 2.231 | 2.181 | 2.131 | 2.081 | 2.031 | 1.981 | 1.932 | 1.882 | 1.832 | 1.782 |
| −5 | 3.025 | 2.476 | 2.426 | 2.376 | 2.327 | 2.277 | 2.227 | 2.177 | 2.127 | 2.077 | 2.027 |
| −5 | $\Delta e \times \Delta B$ | +0.072 | +0.079 | +0.085 | +0.092 | +0.098 | +0.105 | +0.112 | +0.118 | +0.125 | +0.131 |

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.6 | 2.7 | 2.8 | 2.9 | 3.0 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −15° | $\Delta e \times \Delta B$ | +0.136 | +0.143 | +0.149 | +0.156 | +0.162 | +0.169 | +0.175 | +0.182 | +0.188 | +0.195 |
| −17° | 1.041 | 0.008 | | | | | | | | | |
| 16 | 1.142 | 0.108 | 0.059 | 0.010 | | | | | | | |
| −15 | 1.252 | 0.217 | .168 | .119 | 0.069 | 0.020 | | | | | |
| 14 | 1.373 | .336 | .287 | .237 | .188 | .139 | 0.089 | 0.040 | | | |
| 13 | 1.503 | .465 | .416 | .366 | .317 | .268 | .218 | .169 | 0.119 | 0.070 | 0.021 |
| 12 | 1.644 | .606 | .556 | .507 | .457 | .408 | .358 | .309 | .259 | .210 | .160 |
| 11 | 1.798 | .758 | .708 | .659 | .609 | .560 | .510 | .461 | .411 | .362 | .312 |
| −10 | 1.964 | .923 | .873 | .824 | .774 | .725 | .675 | .626 | .576 | .526 | .477 |
| 9 | 2.144 | 1.102 | 1.052 | 1.003 | .953 | .903 | .854 | .804 | .755 | .705 | .655 |
| 8 | 2.340 | 1.296 | 1.246 | 1.196 | 1.147 | 1.097 | 1.047 | .998 | .948 | .898 | .849 |
| 7 | 2.550 | 1.506 | 1.456 | 1.406 | 1.356 | 1.307 | 1.257 | 1.207 | 1.157 | 1.108 | 1.058 |
| 6 | 2.778 | 1.732 | 1.683 | 1.633 | 1.583 | 1.533 | 1.483 | 1.434 | 1.384 | 1.334 | 1.284 |
| − 5 | 3.025 | 1.977 | 1.928 | 1.878 | 1.828 | 1.778 | 1.728 | 1.678 | 1.628 | 1.579 | 1.529 |
| − 5 | $\Delta e \times \Delta B$ | +0.138 | +0.144 | +0.151 | +0.157 | +0.164 | +0.171 | +0.177 | +0.184 | +0.190 | +0.197 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### METRIC MEASURES.

Values of $e = e' - 0.000660\,B\,(t-t')\,(1 + 0.00115\,t')$

$B = 760$ mm.

| $t'$ | $t-t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 3.1 | 3.2 | 3.3 | 3.4 | 3.5 | 3.6 | 3.7 | 3.8 | 3.9 | 4.0 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −10° $\Delta e \times \Delta B$ | +0.202 | +0.209 | +0.215 | +0.222 | +0.228 | +0.235 | +0.241 | +0.248 | +0.254 | +0.261 |
| −12° | 0.111 | 0.061 | 0.012 | | | | | | | |
| 11 | .263 | .213 | .164 | 0.114 | 0.065 | 0.015 | | | | |
| −10 | .427 | .378 | .328 | .278 | .229 | .179 | 0.130 | 0.080 | 0.031 | |
| 9 | .606 | .556 | .506 | .457 | .407 | .357 | .308 | .258 | .209 | 0.159 |
| 8 | .799 | .749 | .699 | .650 | .600 | .550 | .501 | .451 | .401 | .352 |
| 7 | 1.008 | .958 | 909 | .859 | .809 | .759 | .710 | .660 | .610 | .560 |
| 6 | 1.234 | 1.184 | 1.135 | 1.085 | 1.035 | .985 | .935 | .886 | .836 | .786 |
| −5 | 1.479 | 1.429 | 1.379 | 1.329 | 1.279 | 1.229 | 1.180 | 1.130 | 1.080 | 1.030 |
| −5 $\Delta e \times \Delta B$ | +0.203 | +0.210 | +0.217 | +0.223 | +0.230 | +0.236 | +0.243 | +0.249 | +0.256 | +0.262 |

| $t'$ | $t-t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4.1 | 4.2 | 4.3 | 4.4 | 4.5 | 4.6 | 4.7 | 4.8 | 4.9 | 5.0 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −8° $\Delta e \times \Delta B$ | +0.268 | +0.275 | +0.281 | +0.288 | +0.294 | +0.301 | +0.307 | +0.314 | +0.320 | +0.327 |
| −9° | 0.109 | 0.060 | 0.010 | | | | | | | |
| 8 | 0.302 | 0.252 | .202 | 0.153 | 0.103 | 0.053 | 0.004 | | | |
| 7 | .510 | .461 | .411 | .361 | .311 | .262 | .212 | 0.162 | 0.112 | 0.063 |
| 6 | .736 | .686 | .637 | .587 | .537 | .487 | .437 | .387 | .338 | .288 |
| −5 | 0.980 | 0.930 | 0.880 | 0.830 | 0.781 | 0.731 | 0.681 | 0.631 | 0.581 | 0.531 |
| −5 $\Delta e \times \Delta B$ | +0.269 | +0.276 | +0.282 | +0.289 | +0.295 | +0.302 | +0.308 | +0.315 | +0.322 | +0.328 |

| $t'$ | $t-t'$ | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5.1 | 5.2 | 5.3 | 5.4 | 5.5 | 5.6 | 5.7 | 5.8 | 5.9 | 6.0 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −7° | 0.013 | | | | | | | | | |
| 6 | .238 | 0.188 | 0.138 | 0.089 | 0.039 | | | | | |
| −5 | 0.481 | 0.431 | 0.382 | 0.332 | 0.282 | 0.232 | 0.182 | 0.132 | 0.082 | 0.033 |
| −5 $\Delta e \times \Delta B$ | +0.335 | +0.341 | +0.348 | +0.354 | +0.361 | +0.367 | +0.374 | +0.381 | +0.387 | +0.394 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### METRIC MEASURES.

**Values of** $e = e' - 0.000660\,B\,(t - t')\,(1 + 0.00115\,t')$

$B = 760$ mm.

| $t'$ | $t - t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| −5° | $\Delta e \times \Delta B$ | +0.07 | +0.13 | +0.20 | +0.26 | +0.33 | +0.39 | +0.46 | +0.52 | +0.59 | +0.66 |
| −5° | 3.02 | 2.53 | 2.03 | 1.53 | 1.03 | 0.53 | 0.03 | | | | |
| 4 | 3.29 | 2.79 | 2.29 | 1.79 | 1.29 | 0.79 | 0.29 | | | | |
| 3 | 3.58 | 3.08 | 2.58 | 2.08 | 1.58 | 1.08 | 0.58 | 0.08 | | | |
| 2 | 3.89 | 3.39 | 2.89 | 2.39 | 1.89 | 1.38 | 0.88 | 0.38 | | | |
| 1 | 4.22 | 3.72 | 3.22 | 2.72 | 2.22 | 1.71 | 1.21 | 0.71 | 0.21 | | |
| ±0 | 4.58 | 4.08 | 3.58 | 3.08 | 2.57 | 2.07 | 1.57 | 1.07 | 0.57 | 0.07 | |
| +1 | 4.92 | 4.42 | 3.92 | 3.42 | 2.92 | 2.41 | 1.91 | 1.41 | 0.91 | 0.40 | |
| 2 | 5.29 | 4.79 | 4.29 | 3.78 | 3.28 | 2.78 | 2.27 | 1.77 | 1.27 | 0.77 | 0.26 |
| 3 | 5.68 | 5.18 | 4.68 | 4.17 | 3.67 | 3.17 | 2.66 | 2.16 | 1.66 | 1.15 | 0.65 |
| 4 | 6.10 | 5.59 | 5.09 | 4.59 | 4.08 | 3.58 | 3.07 | 2.57 | 2.07 | 1.56 | 1.06 |
| 5 | 6.54 | 6.03 | 5.53 | 5.03 | 4.52 | 4.02 | 3.51 | 3.01 | 2.51 | 2.00 | 1.50 |
| 6 | 7.01 | 6.51 | 6.00 | 5.50 | 4.99 | 4.49 | 3.98 | 3.48 | 2.97 | 2.47 | 1.96 |
| 7 | 7.51 | 7.01 | 6.50 | 6.00 | 5.49 | 4.98 | 4.48 | 3.97 | 3.47 | 2.96 | 2.46 |
| 8 | 8.05 | 7.54 | 7.03 | 6.53 | 6.02 | 5.51 | 5.01 | 4.50 | 4.00 | 3.49 | 2.98 |
| 9 | 8.61 | 8.10 | 7.60 | 7.09 | 6.58 | 6.08 | 5.57 | 5.06 | 4.56 | 4.05 | 3.54 |
| 10 | 9.21 | 8.70 | 8.20 | 7.69 | 7.18 | 6.67 | 6.17 | 5.66 | 5.15 | 4.64 | 4.14 |
| 11 | 9.85 | 9.34 | 8.83 | 8.32 | 7.81 | 7.31 | 6.80 | 6.29 | 5.78 | 5.27 | 4.77 |
| 12 | 10.52 | 10.01 | 9.50 | 9.00 | 8.49 | 7.98 | 7.47 | 6.96 | 6.45 | 5.94 | 5.44 |
| 13 | 11.24 | 10.73 | 10.22 | 9.71 | 9.20 | 8.69 | 8.18 | 7.67 | 7.16 | 6.65 | 6.14 |
| 14 | 11.99 | 11.48 | 10.97 | 10.46 | 9.95 | 9.44 | 8.93 | 8.42 | 7.91 | 7.41 | 6.90 |
| 15 | 12.79 | 12.28 | 11.77 | 11.26 | 10.75 | 10.24 | 9.73 | 9.22 | 8.71 | 8.20 | 7.69 |
| 16 | 13.64 | 13.13 | 12.62 | 12.11 | 11.60 | 11.09 | 10.58 | 10.07 | 9.56 | 9.04 | 8.53 |
| 17 | 14.54 | 14.03 | 13.52 | 13.00 | 12.49 | 11.98 | 11.47 | 10.96 | 10.45 | 9.94 | 9.42 |
| 18 | 15.49 | 14.98 | 14.46 | 13.95 | 13.44 | 12.93 | 12.42 | 11.90 | 11.39 | 10.88 | 10.37 |
| 19 | 16.49 | 15.98 | 15.46 | 14.95 | 14.44 | 13.93 | 13.41 | 12.90 | 12.39 | 11.88 | 11.36 |
| 20 | 17.55 | 17.03 | 16.52 | 16.01 | 15.50 | 14.98 | 14.47 | 13.96 | 13.44 | 12.93 | 12.42 |
| 21 | 18.66 | 18.15 | 17.64 | 17.12 | 16.61 | 16.10 | 15.58 | 15.07 | 14.56 | 14.04 | 13.53 |
| 22 | 19.84 | 19.33 | 18.82 | 18.30 | 17.79 | 17.27 | 16.76 | 16.24 | 15.73 | 15.22 | 14.70 |
| 23 | 21.09 | 20.57 | 20.06 | 19.54 | 19.03 | 18.51 | 18.00 | 17.48 | 16.97 | 16.45 | 15.94 |
| 24 | 22.40 | 21.88 | 21.37 | 20.85 | 20.34 | 19.82 | 19.31 | 18.79 | 18.27 | 17.76 | 17.24 |
| 25 | 23.78 | 23.26 | 22.75 | 22.23 | 21.72 | 21.20 | 20.68 | 20.17 | 19.65 | 19.14 | 18.62 |
| 26 | 25.24 | 24.72 | 24.20 | 23.69 | 23.17 | 22.65 | 22.14 | 21.62 | 21.10 | 20.59 | 20.07 |
| 27 | 26.77 | 26.25 | 25.73 | 25.22 | 24.70 | 24.18 | 23.66 | 23.15 | 22.63 | 22.11 | 21.60 |
| 28 | 28.38 | 27.86 | 27.34 | 26.83 | 26.31 | 25.79 | 25.27 | 24.76 | 24.24 | 23.72 | 23.20 |
| 29 | 30.08 | 29.56 | 29.04 | 28.52 | 28.00 | 27.48 | 26.97 | 26.45 | 25.93 | 25.41 | 24.89 |
| 30 | 31.86 | 31.34 | 30.82 | 30.30 | 29.78 | 29.27 | 28.75 | 28.23 | 27.71 | 27.19 | 26.67 |
| 31 | 33.74 | 33.22 | 32.70 | 32.18 | 31.66 | 31.14 | 30.62 | 30.10 | 29.58 | 29.06 | 28.54 |
| 32 | 35.70 | 35.18 | 34.66 | 34.14 | 33.62 | 33.10 | 32.58 | 32.06 | 31.54 | 31.02 | 30.50 |
| 33 | 37.78 | 37.25 | 36.73 | 36.21 | 35.69 | 35.17 | 34.65 | 34.13 | 33.61 | 33.09 | 32.57 |
| 34 | 39.95 | 39.43 | 38.90 | 38.38 | 37.86 | 37.34 | 36.82 | 36.30 | 35.78 | 35.26 | 34.73 |
| 35 | 42.23 | 41.71 | 41.18 | 40.66 | 40.14 | 39.62 | 39.10 | 38.57 | 38.05 | 37.53 | 37.01 |
| 36 | 44.62 | 44.10 | 43.57 | 43.05 | 42.53 | 42.01 | 41.48 | 40.96 | 40.44 | 39.92 | 39.40 |
| 37 | 47.13 | 46.60 | 46.08 | 45.56 | 45.04 | 44.51 | 43.99 | 43.47 | 42.94 | 42.42 | 41.90 |
| 38 | 49.76 | 49.23 | 48.71 | 48.19 | 47.66 | 47.14 | 46.61 | 46.09 | 45.57 | 45.04 | 44.52 |
| 39 | 52.51 | 51.99 | 51.46 | 50.94 | 50.41 | 49.89 | 49.37 | 48.84 | 48.32 | 47.79 | 47.27 |
| 40 | 55.40 | 54.87 | 54.35 | 53.82 | 53.30 | 52.77 | 52.25 | 51.72 | 51.20 | 50.67 | 50.15 |
| 41 | 58.42 | 57.89 | 57.37 | 56.84 | 56.32 | 55.79 | 55.27 | 54.74 | 54.21 | 53.69 | 53.16 |
| 42 | 61.58 | 61.05 | 60.53 | 60.00 | 59.48 | 58.95 | 58.43 | 57.90 | 57.37 | 56.85 | 56.32 |
| 43 | 64.89 | 64.36 | 63.84 | 63.31 | 62.78 | 62.26 | 61.73 | 61.20 | 60.68 | 60.15 | 59.62 |
| 44 | 68.35 | 67.82 | 67.30 | 66.77 | 66.24 | 65.72 | 65.19 | 64.66 | 64.13 | 63.61 | 63.08 |
| 45 | 71.97 | 71.44 | 70.91 | 70.39 | 69.86 | 69.33 | 68.80 | 68.28 | 67.75 | 67.22 | 66.69 |
| 45 | $\Delta e \times \Delta B$ | +0.07 | +0.14 | +0.21 | +0.28 | +0.35 | +0.42 | +0.49 | +0.56 | +0.62 | +0.69 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### METRIC MEASURES.

Values of $e = e' - 0.000660\ B\ (t - t')\ (1 + 0.00115\ t')$

$B = 760$ mm.

| $t'$ | $t-t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| +5° | $\Delta e \times \Delta B$ | +0.73 | +0.80 | +0.86 | +0.93 | +1.00 | +1.06 | +1.13 | +1.19 | +1.26 | +1.33 |
| +3° | 5.68 | 0.15 | | | | | | | | | |
| 4 | 6.10 | 0.56 | 0.05 | | | | | | | | |
| 5 | 6.54 | 0.99 | 0.49 | | | | | | | | |
| 6 | 7.01 | 1.46 | 0.95 | 0.45 | | | | | | | |
| 7 | 7.51 | 1.95 | 1.45 | 0.94 | 0.43 | | | | | | |
| 8 | 8.05 | 2.48 | 1.97 | 1.46 | 0.96 | 0.45 | | | | | |
| 9 | 8.61 | 3.04 | 2.53 | 2.02 | 1.52 | 1.01 | 0.50 | | | | |
| 10 | 9.21 | 3.63 | 3.12 | 2.61 | 2.11 | 1.60 | 1.09 | 0.58 | 0.08 | | |
| 11 | 9.85 | 4.26 | 3.75 | 3.24 | 2.73 | 2.23 | 1.72 | 1.21 | 0.70 | 0.20 | |
| 12 | 10.52 | 4.93 | 4.42 | 3.91 | 3.40 | 2.89 | 2.38 | 1.88 | 1.37 | 0.86 | 0.35 |
| 13 | 11.24 | 5.63 | 5.13 | 4.62 | 4.11 | 3.60 | 3.09 | 2.58 | 2.07 | 1.56 | 1.05 |
| 14 | 11.99 | 6.39 | 5.88 | 5.37 | 4.86 | 4.35 | 3.84 | 3.33 | 2.82 | 2.31 | 1.80 |
| 15 | 12.79 | 7.18 | 6.67 | 6.16 | 5.65 | 5.14 | 4.63 | 4.12 | 3.61 | 3.10 | 2.59 |
| 16 | 13.64 | 8.02 | 7.51 | 7.00 | 6.49 | 5.98 | 5.47 | 4.96 | 4.45 | 3.94 | 3.43 |
| 17 | 14.54 | 8.91 | 8.40 | 7.89 | 7.38 | 6.87 | 6.36 | 5.85 | 5.33 | 4.82 | 4.31 |
| 18 | 15.49 | 9.86 | 9.34 | 8.83 | 8.32 | 7.81 | 7.30 | 6.78 | 6.27 | 5.76 | 5.25 |
| 19 | 16.49 | 10.85 | 10.34 | 9.83 | 9.31 | 8.80 | 8.29 | 7.78 | 7.26 | 6.75 | 6.24 |
| 20 | 17.55 | 11.90 | 11.39 | 10.88 | 10.36 | 9.85 | 9.34 | 8.82 | 8.31 | 7.80 | 7.29 |
| 21 | 18.66 | 13.01 | 12.50 | 11.99 | 11.47 | 10.96 | 10.45 | 9.93 | 9.42 | 8.90 | 8.39 |
| 22 | 19.84 | 14.19 | 13.67 | 13.16 | 12.64 | 12.13 | 11.62 | 11.10 | 10.59 | 10.07 | 9.56 |
| 23 | 21.09 | 15.42 | 14.91 | 14.39 | 13.88 | 13.36 | 12.85 | 12.33 | 11.82 | 11.30 | 10.79 |
| 24 | 22.40 | 16.73 | 16.21 | 15.70 | 15.18 | 14.67 | 14.15 | 13.64 | 13.12 | 12.60 | 12.09 |
| 25 | 23.78 | 18.10 | 17.59 | 17.07 | 16.56 | 16.04 | 15.52 | 15.01 | 14.49 | 13.98 | 13.46 |
| 26 | 25.24 | 19.55 | 19.04 | 18.52 | 18.00 | 17.49 | 16.97 | 16.45 | 15.94 | 15.42 | 14.90 |
| 27 | 26.77 | 21.08 | 20.56 | 20.04 | 19.53 | 19.01 | 18.49 | 17.98 | 17.46 | 16.94 | 16.42 |
| 28 | 28.38 | 22.68 | 22.17 | 21.65 | 21.13 | 20.61 | 20.10 | 19.58 | 19.06 | 18.54 | 18.02 |
| 29 | 30.08 | 24.37 | 23.86 | 23.34 | 22.82 | 22.30 | 21.78 | 21.26 | 20.75 | 20.23 | 19.71 |
| 30 | 31.86 | 26.15 | 25.63 | 25.11 | 24.60 | 24.08 | 23.56 | 23.04 | 22.52 | 22.00 | 21.48 |
| 31 | 33.74 | 28.02 | 27.50 | 26.98 | 26.46 | 25.94 | 25.42 | 24.90 | 24.38 | 23.86 | 23.34 |
| 32 | 35.70 | 29.98 | 29.46 | 28.94 | 28.42 | 27.90 | 27.38 | 26.86 | 26.34 | 25.82 | 25.30 |
| 33 | 37.78 | 32.05 | 31.53 | 31.01 | 30.49 | 29.97 | 29.44 | 28.92 | 28.40 | 27.88 | 27.36 |
| 34 | 39.95 | 34.21 | 33.69 | 33.17 | 32.65 | 32.13 | 31.61 | 31.09 | 30.57 | 30.04 | 29.52 |
| 35 | 42.23 | 36.49 | 35.97 | 35.44 | 34.92 | 34.40 | 33.88 | 33.36 | 32.83 | 32.31 | 31.79 |
| 36 | 44.62 | 38.87 | 38.35 | 37.83 | 37.31 | 36.78 | 36.26 | 35.74 | 35.22 | 34.69 | 34.17 |
| 37 | 47.13 | 41.37 | 40.85 | 40.33 | 39.81 | 39.28 | 38.76 | 38.24 | 37.71 | 37.19 | 36.67 |
| 38 | 49.76 | 44.00 | 43.47 | 42.95 | 42.43 | 41.90 | 41.38 | 40.86 | 40.33 | 39.81 | 39.29 |
| 39 | 52.51 | 46.74 | 46.22 | 45.70 | 45.17 | 44.65 | 44.12 | 43.60 | 43.08 | 42.55 | 42.03 |
| 40 | 55.40 | 49.62 | 49.10 | 48.58 | 48.05 | 47.53 | 47.00 | 46.48 | 45.95 | 45.43 | 44.90 |
| 41 | 58.42 | 52.64 | 52.11 | 51.59 | 51.06 | 50.54 | 50.01 | 49.49 | 48.96 | 48.44 | 47.91 |
| 42 | 61.58 | 55.80 | 55.27 | 54.74 | 54.22 | 53.69 | 53.17 | 52.64 | 52.12 | 51.59 | 51.06 |
| 43 | 64.89 | 59.10 | 58.57 | 58.05 | 57.52 | 56.99 | 56.47 | 55.94 | 55.41 | 54.89 | 54.36 |
| 44 | 68.35 | 62.55 | 62.03 | 61.50 | 60.97 | 60.45 | 59.92 | 59.39 | 58.86 | 58.34 | 57.81 |
| 45 | 71.97 | 66.16 | 65.64 | 65.11 | 64.58 | 64.05 | 63.53 | 63.00 | 62.47 | 61.94 | 61.42 |
| 45 | $\Delta e \times \Delta B$ | +0.76 | +0.83 | +0.90 | +0.97 | +1.04 | +1.11 | +1.18 | +1.25 | +1.32 | +1.39 |

## REDUCTION OF PSYCHROMETRIC OBSERVATIONS.

### METRIC MEASURES.

Values of $e = e' - 0.000660\, B\, (t - t')\, (1 + 0.00115\, t')$

$B = 760$ mm.

| $t'$ | $t-t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| C. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| +15° | $\Delta e \times \Delta B$ | +0.141 | +0.148 | +0.154 | +0.161 | +0.168 | +0.175 | +0.181 | +0.188 | +0.195 | +0.201 |
| 13° | 11.24 | 0.54 | 0.03 | | | | | | | | |
| 14 | 11.99 | 1.29 | 0.78 | 0.27 | | | | | | | |
| 15 | 12.79 | 2.08 | 1.57 | 1.06 | 0.55 | 0.04 | | | | | |
| +16 | 13.64 | 2.91 | 2.40 | 1.89 | 1.38 | 0.87 | 0.36 | | | | |
| 17 | 14.54 | 3.80 | 3.29 | 2.78 | 2.27 | 1.75 | 1.24 | 0.73 | 0.22 | | |
| 18 | 15.49 | 4.74 | 4.22 | 3.71 | 3.20 | 2.69 | 2.18 | 1.66 | 1.15 | 0.64 | 0.13 |
| 19 | 16.49 | 5.73 | 5.21 | 4.70 | 4.19 | 3.68 | 3.16 | 2.65 | 2.14 | 1.62 | 1.11 |
| 20 | 17.55 | 6.77 | 6.26 | 5.75 | 5.23 | 4.72 | 4.21 | 3.69 | 3.18 | 2.67 | 2.15 |
| +21 | 18.66 | 7.88 | 7.36 | 6.85 | 6.34 | 5.82 | 5.31 | 4.79 | 4.28 | 3.77 | 3.25 |
| 22 | 19.84 | 9.04 | 8.53 | 8.02 | 7.50 | 6.99 | 6.47 | 5.96 | 5.44 | 4.93 | 4.42 |
| 23 | 21.09 | 10.27 | 9.76 | 9.25 | 8.73 | 8.22 | 7.70 | 7.19 | 6.67 | 6.16 | 5.64 |
| 24 | 22.40 | 11.57 | 11.06 | 10.54 | 10.03 | 9.51 | 9.00 | 8.48 | 7.97 | 7.45 | 6.93 |
| 25 | 23.78 | 12.94 | 12.43 | 11.91 | 11.40 | 10.88 | 10.36 | 9.85 | 9.33 | 8.82 | 8.30 |
| +26 | 25.24 | 14.39 | 13.87 | 13.35 | 12.84 | 12.32 | 11.80 | 11.29 | 10.77 | 10.25 | 9.74 |
| 27 | 26.77 | 15.91 | 15.39 | 14.87 | 14.35 | 13.84 | 13.32 | 12.80 | 12.29 | 11.77 | 11.25 |
| 28 | 28.38 | 17.51 | 16.99 | 16.47 | 15.95 | 15.44 | 14.92 | 14.40 | 13.88 | 13.37 | 12.85 |
| 29 | 30.08 | 19.19 | 18.67 | 18.15 | 17.64 | 17.12 | 16.60 | 16.08 | 15.56 | 15.04 | 14.53 |
| 30 | 31.86 | 20.96 | 20.44 | 19.93 | 19.41 | 18.89 | 18.37 | 17.85 | 17.33 | 16.81 | 16.29 |
| +31 | 33.74 | 22.83 | 22.31 | 21.79 | 21.27 | 20.75 | 20.23 | 19.71 | 19.19 | 18.67 | 18.15 |
| 32 | 35.70 | 24.78 | 24.26 | 23.74 | 23.22 | 22.70 | 22.18 | 21.66 | 21.14 | 20.62 | 20.10 |
| 33 | 37.78 | 26.84 | 26.32 | 25.80 | 25.28 | 24.76 | 24.24 | 23.72 | 23.20 | 22.68 | 22.16 |
| 34 | 39.95 | 29.00 | 28.48 | 27.96 | 27.44 | 26.92 | 26.40 | 25.87 | 25.35 | 24.83 | 24.31 |
| 35 | 42.23 | 31.27 | 30.75 | 30.23 | 29.70 | 29.18 | 28.66 | 28.14 | 27.62 | 27.10 | 26.57 |
| +36 | 44.62 | 33.65 | 33.13 | 32.60 | 32.08 | 31.56 | 31.04 | 30.52 | 29.99 | 29.47 | 28.95 |
| 37 | 47.13 | 36.15 | 35.62 | 35.10 | 34.58 | 34.05 | 33.53 | 33.01 | 32.48 | 31.96 | 31.44 |
| 38 | 49.76 | 38.76 | 38.24 | 37.72 | 37.19 | 36.67 | 36.14 | 35.62 | 35.10 | 34.57 | 34.05 |
| 39 | 52.51 | 41.50 | 40.98 | 40.46 | 39.93 | 39.41 | 38.88 | 38.36 | 37.84 | 37.31 | 36.79 |
| 40 | 55.40 | 44.38 | 43.85 | 43.33 | 42.80 | 42.28 | 41.75 | 41.23 | 40.71 | 40.18 | 39.66 |
| +40 | $\Delta e \times \Delta B$ | +0.145 | +0.152 | +0.159 | +0.166 | +0.173 | +0.179 | +0.186 | +0.193 | +0.200 | +0.207 |

| $t'$ | $t-t'$ | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| C. | | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. | mm. |
| +20° | $\Delta e \times \Delta B$ | +0.209 | +0.216 | +0.223 | +0.230 | +0.236 | +0.243 | +0.250 | +0.257 | +0.263 | +0.270 |
| 19° | | 0.60 | 0.09 | | | | | | | | |
| 20 | | 1.64 | 1.13 | 0.61 | 0.10 | | | | | | |
| 21 | | 2.74 | 2.23 | 1.71 | 1.20 | 0.69 | 0.17 | | | | |
| 22 | | 3.90 | 3.39 | 2.87 | 2.36 | 1.84 | 1.33 | 0.82 | 0.30 | | |
| 23 | | 5.13 | 4.61 | 4.10 | 3.58 | 3.07 | 2.55 | 2.04 | 1.52 | 1.01 | 0.49 |
| 24 | | 6.42 | 5.90 | 5.39 | 4.87 | 4.36 | 3.84 | 3.33 | 2.81 | 2.30 | 1.78 |
| 25 | | 7.78 | 7.27 | 6.75 | 6.24 | 5.72 | 5.20 | 4.69 | 4.17 | 3.66 | 3.14 |
| +26 | | 9.22 | 8.70 | 8.19 | 7.67 | 7.15 | 6.64 | 6.12 | 5.60 | 5.09 | 4.57 |
| 27 | | 10.73 | 10.22 | 9.70 | 9.18 | 8.67 | 8.15 | 7.63 | 7.11 | 6.60 | 6.08 |
| 28 | | 12.33 | 11.81 | 11.29 | 10.78 | 10.26 | 9.74 | 9.22 | 8.71 | 8.19 | 7.67 |
| 29 | | 14.01 | 13.49 | 12.97 | 12.45 | 11.93 | 11.42 | 10.90 | 10.38 | 9.86 | 9.34 |
| 30 | | 15.77 | 15.26 | 14.74 | 14.22 | 13.70 | 13.18 | 12.66 | 12.14 | 11.62 | 11.10 |
| +30 | $\Delta e \times \Delta B$ | +0.212 | +0.218 | +0.225 | +0.232 | +0.239 | +0.246 | +0.253 | +0.259 | +0.266 | +0.273 |

## RELATIVE HUMIDITY.
## TEMPERATURE CENTIGRADE.

| Air Temperature. C. | RELATIVE HUMIDITY, OR PERCENTAGE OF SATURATION. 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Vapor pressure (millimeters). | | | | | | | | | |
| −45° | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.03 | 0.04 | 0.04 | 0.05 | 0.05 |
| 44 | 0.01 | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 | 0.04 | 0.05 | 0.05 | 0.06 |
| 43 | 0.01 | 0.01 | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 |
| 42 | 0.01 | 0.02 | 0.02 | 0.03 | 0.04 | 0.05 | 0.05 | 0.06 | 0.07 | 0.08 |
| 41 | 0.01 | 0.02 | 0.03 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 |
| −40 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.09 | 0.10 |
| 39 | 0.01 | 0.02 | 0.03 | 0.04 | 0.05 | 0.06 | 0.08 | 0.09 | 0.10 | 0.11 |
| 38 | 0.01 | 0.02 | 0.04 | 0.05 | 0.06 | 0.07 | 0.08 | 0.10 | 0.11 | 0.12 |
| 37 | 0.01 | 0.03 | 0.04 | 0.05 | 0.07 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 |
| 36 | 0.02 | 0.03 | 0.05 | 0.06 | 0.08 | 0.09 | 0.11 | 0.12 | 0.14 | 0.15 |
| −35 | 0.02 | 0.03 | 0.05 | 0.07 | 0.08 | 0.10 | 0.12 | 0.13 | 0.15 | 0.17 |
| 34 | 0.02 | 0.04 | 0.06 | 0.08 | 0.09 | 0.11 | 0.13 | 0.15 | 0.17 | 0.19 |
| 33 | 0.02 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 | 0.15 | 0.17 | 0.19 | 0.21 |
| 32 | 0.02 | 0.05 | 0.07 | 0.09 | 0.12 | 0.14 | 0.16 | 0.19 | 0.21 | 0.23 |
| 31 | 0.03 | 0.05 | 0.08 | 0.10 | 0.13 | 0.16 | 0.18 | 0.21 | 0.23 | 0.26 |
| −30 | 0.03 | 0.06 | 0.09 | 0.12 | 0.14 | 0.17 | 0.20 | 0.23 | 0.26 | 0.29 |
| 29 | 0.03 | 0.06 | 0.10 | 0.13 | 0.16 | 0.19 | 0.22 | 0.26 | 0.29 | 0.32 |
| 28 | 0.04 | 0.07 | 0.11 | 0.14 | 0.18 | 0.21 | 0.25 | 0.28 | 0.32 | 0.35 |
| 27 | 0.04 | 0.08 | 0.12 | 0.16 | 0.20 | 0.24 | 0.27 | 0.31 | 0.35 | 0.39 |
| 26 | 0.04 | 0.09 | 0.13 | 0.17 | 0.22 | 0.26 | 0.30 | 0.35 | 0.39 | 0.43 |
| −25 | 0.05 | 0.10 | 0.14 | 0.19 | 0.24 | 0.29 | 0.34 | 0.38 | 0.43 | 0.48 |
| 24 | 0.05 | 0.11 | 0.16 | 0.21 | 0.27 | 0.32 | 0.37 | 0.42 | 0.48 | 0.53 |
| 23 | 0.06 | 0.12 | 0.18 | 0.23 | 0.29 | 0.35 | 0.41 | 0.47 | 0.53 | 0.59 |
| 22 | 0.06 | 0.13 | 0.19 | 0.26 | 0.32 | 0.39 | 0.45 | 0.52 | 0.58 | 0.65 |
| 21 | 0.07 | 0.14 | 0.21 | 0.28 | 0.36 | 0.43 | 0.50 | 0.57 | 0.64 | 0.71 |
| −20 | 0.08 | 0.16 | 0.24 | 0.31 | 0.39 | 0.47 | 0.55 | 0.63 | 0.71 | 0.78 |
| 19 | 0.09 | 0.17 | 0.26 | 0.34 | 0.43 | 0.52 | 0.60 | 0.69 | 0.78 | 0.86 |
| 18 | 0.09 | 0.19 | 0.28 | 0.38 | 0.47 | 0.57 | 0.66 | 0.76 | 0.85 | 0.95 |
| 17 | 0.10 | 0.21 | 0.31 | 0.42 | 0.52 | 0.62 | 0.73 | 0.83 | 0.94 | 1.04 |
| 16 | 0.11 | 0.23 | 0.34 | 0.46 | 0.57 | 0.69 | 0.80 | 0.91 | 1.03 | 1.14 |
| −15 | 0.13 | 0.25 | 0.38 | 0.50 | 0.63 | 0.75 | 0.88 | 1.00 | 1.13 | 1.25 |
| 14 | 0.14 | 0.27 | 0.41 | 0.55 | 0.69 | 0.82 | 0.96 | 1.10 | 1.24 | 1.37 |
| 13 | 0.15 | 0.30 | 0.45 | 0.60 | 0.75 | 0.90 | 1.05 | 1.20 | 1.35 | 1.50 |
| 12 | 0.16 | 0.33 | 0.49 | 0.66 | 0.82 | 0.99 | 1.15 | 1.32 | 1.48 | 1.64 |
| 11 | 0.18 | 0.36 | 0.54 | 0.72 | 0.90 | 1.08 | 1.26 | 1.44 | 1.62 | 1.80 |
| −10 | 0.20 | 0.39 | 0.59 | 0.79 | 0.98 | 1.18 | 1.38 | 1.57 | 1.77 | 1.96 |
| 9 | 0.21 | 0.43 | 0.64 | 0.86 | 1.07 | 1.29 | 1.50 | 1.72 | 1.93 | 2.14 |
| 8 | 0.23 | 0.47 | 0.70 | 0.94 | 1.17 | 1.40 | 1.64 | 1.87 | 2.11 | 2.34 |
| 7 | 0.26 | 0.51 | 0.77 | 1.02 | 1.28 | 1.53 | 1.79 | 2.04 | 2.30 | 2.55 |
| 6 | 0.28 | 0.56 | 0.83 | 1.11 | 1.39 | 1.67 | 1.94 | 2.22 | 2.50 | 2.78 |
| −5 | 0.30 | 0.60 | 0.91 | 1.21 | 1.51 | 1.81 | 2.12 | 2.42 | 2.72 | 3.02 |
| 4 | 0.33 | 0.66 | 0.99 | 1.32 | 1.65 | 1.97 | 2.30 | 2.63 | 2.96 | 3.29 |
| 3 | 0.36 | 0.72 | 1.07 | 1.43 | 1.79 | 2.15 | 2.50 | 2.86 | 3.22 | 3.58 |
| 2 | 0.39 | 0.78 | 1.17 | 1.55 | 1.94 | 2.33 | 2.72 | 3.11 | 3.50 | 3.89 |
| 1 | 0.42 | 0.84 | 1.27 | 1.69 | 2.11 | 2.53 | 2.95 | 3.38 | 3.80 | 4.22 |
| ± 0 | 0.46 | 0.92 | 1.37 | 1.83 | 2.29 | 2.75 | 3.21 | 3.66 | 4.12 | 4.58 |
| + 1 | 0.49 | 0.98 | 1.48 | 1.97 | 2.46 | 2.95 | 3.45 | 3.94 | 4.43 | 4.92 |
| 2 | 0.53 | 1.06 | 1.59 | 2.12 | 2.65 | 3.17 | 3.70 | 4.23 | 4.76 | 5.29 |
| 3 | 0.57 | 1.14 | 1.70 | 2.27 | 2.84 | 3.41 | 3.98 | 4.55 | 5.11 | 5.68 |
| 4 | 0.61 | 1.22 | 1.83 | 2.44 | 3.05 | 3.66 | 4.27 | 4.88 | 5.49 | 6.10 |
| + 5 | 0.65 | 1.31 | 1.96 | 2.62 | 3.27 | 3.92 | 4.58 | 5.23 | 5.89 | 6.54 |

# RELATIVE HUMIDITY.

## TEMPERATURE CENTIGRADE.

| Air Temperature. | RELATIVE HUMIDITY, OR PERCENTAGE OF SATURATION. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| C. | Vapor pressure (millimeters). | | | | | | | | | |
| 5° | 0.7 | 1.3 | 2.0 | 2.6 | 3.3 | 3.9 | 4.6 | 5.2 | 5.9 | 6.5 |
| 6 | 0.7 | 1.4 | 2.1 | 2.8 | 3.5 | 4.2 | 4.9 | 5.6 | 6.3 | 7.0 |
| 7 | 0.8 | 1.5 | 2.3 | 3.0 | 3.8 | 4.5 | 5.3 | 6.0 | 6.8 | 7.5 |
| 8 | 0.8 | 1.6 | 2.4 | 3.2 | 4.0 | 4.8 | 5.6 | 6.4 | 7.2 | 8.0 |
| 9 | 0.9 | 1.7 | 2.6 | 3.4 | 4.3 | 5.2 | 6.0 | 6.9 | 7.7 | 8.6 |
| 10 | 0.9 | 1.8 | 2.8 | 3.7 | 4.6 | 5.5 | 6.4 | 7.4 | 8.3 | 9.2 |
| 11 | 1.0 | 2.0 | 3.0 | 3.9 | 4.9 | 5.9 | 6.9 | 7.9 | 8.9 | 9.8 |
| 12 | 1.1 | 2.1 | 3.2 | 4.2 | 5.3 | 6.3 | 7.4 | 8.4 | 9.5 | 10.5 |
| 13 | 1.1 | 2.2 | 3.4 | 4.5 | 5.6 | 6.7 | 7.9 | 9.0 | 10.1 | 11.2 |
| 14 | 1.2 | 2.4 | 3.6 | 4.8 | 6.0 | 7.2 | 8.4 | 9.6 | 10.8 | 12.0 |
| 15 | 1.3 | 2.6 | 3.8 | 5.1 | 6.4 | 7.7 | 9.0 | 10.2 | 11.5 | 12.8 |
| 16 | 1.4 | 2.7 | 4.1 | 5.5 | 6.8 | 8.2 | 9.5 | 10.9 | 12.3 | 13.6 |
| 17 | 1.5 | 2.9 | 4.4 | 5.8 | 7.3 | 8.7 | 10.2 | 11.6 | 13.1 | 14.5 |
| 18 | 1.5 | 3.1 | 4.6 | 6.2 | 7.7 | 9.3 | 10.8 | 12.4 | 13.9 | 15.5 |
| 19 | 1.6 | 3.3 | 4.9 | 6.6 | 8.2 | 9.9 | 11.5 | 13.2 | 14.8 | 16.5 |
| 20 | 1.8 | 3.5 | 5.3 | 7.0 | 8.8 | 10.5 | 12.3 | 14.0 | 15.8 | 17.5 |
| 21 | 1.9 | 3.7 | 5.6 | 7.5 | 9.3 | 11.2 | 13.1 | 14.9 | 16.8 | 18.7 |
| 22 | 2.0 | 4.0 | 6.0 | 7.9 | 9.9 | 11.9 | 13.9 | 15.9 | 17.9 | 19.8 |
| 23 | 2.1 | 4.2 | 6.3 | 8.4 | 10.5 | 12.7 | 14.8 | 16.9 | 19.0 | 21.1 |
| 24 | 2.2 | 4.5 | 6.7 | 9.0 | 11.2 | 13.4 | 15.7 | 17.9 | 20.2 | 22.4 |
| 25 | 2.4 | 4.8 | 7.1 | 9.5 | 11.9 | 14.3 | 16.6 | 19.0 | 21.4 | 23.8 |
| 26 | 2.5 | 5.0 | 7.6 | 10.1 | 12.6 | 15.1 | 17.7 | 20.2 | 22.7 | 25.2 |
| 27 | 2.7 | 5.4 | 8.0 | 10.7 | 13.4 | 16.1 | 18.7 | 21.4 | 24.1 | 26.8 |
| 28 | 2.8 | 5.7 | 8.5 | 11.4 | 14.2 | 17.0 | 19.9 | 22.7 | 25.5 | 28.4 |
| 29 | 3.0 | 6.0 | 9.0 | 12.0 | 15.0 | 18.0 | 21.1 | 24.1 | 27.1 | 30.1 |
| 30 | 3.2 | 6.4 | 9.6 | 12.7 | 15.9 | 19.1 | 22.3 | 25.5 | 28.7 | 31.9 |
| 31 | 3.4 | 6.7 | 10.1 | 13.5 | 16.9 | 20.2 | 23.6 | 27.0 | 30.4 | 33.7 |
| 32 | 3.6 | 7.1 | 10.7 | 14.3 | 17.9 | 21.4 | 25.0 | 28.6 | 32.1 | 35.7 |
| 33 | 3.8 | 7.6 | 11.3 | 15.1 | 18.9 | 22.7 | 26.4 | 30.2 | 34.0 | 37.8 |
| 34 | 4.0 | 8.0 | 12.0 | 16.0 | 20.0 | 24.0 | 28.0 | 32.0 | 36.0 | 39.9 |
| 35 | 4.2 | 8.4 | 12.7 | 16.9 | 21.1 | 25.3 | 29.6 | 33.8 | 38.0 | 42.2 |
| 36 | 4.5 | 8.9 | 13.4 | 17.8 | 22.3 | 26.8 | 31.2 | 35.7 | 40.2 | 44.6 |
| 37 | 4.7 | 9.4 | 14.1 | 18.9 | 23.6 | 28.3 | 33.0 | 37.7 | 42.4 | 47.1 |
| 38 | 5.0 | 10.0 | 14.9 | 19.9 | 24.9 | 29.9 | 34.8 | 39.8 | 44.8 | 49.8 |
| 39 | 5.3 | 10.5 | 15.8 | 21.0 | 26.3 | 31.5 | 36.8 | 42.0 | 47.3 | 52.5 |
| 40 | 5.5 | 11.1 | 16.6 | 22.2 | 27.7 | 33.2 | 38.8 | 44.3 | 49.9 | 55.4 |
| 41 | 5.8 | 11.7 | 17.5 | 23.4 | 29.2 | 35.1 | 40.9 | 46.7 | 52.6 | 58.4 |
| 42 | 6.2 | 12.3 | 18.5 | 24.6 | 30.8 | 36.9 | 43.1 | 49.3 | 55.4 | 61.6 |
| 43 | 6.5 | 13.0 | 19.5 | 26.0 | 32.4 | 38.9 | 45.4 | 51.9 | 58.4 | 64.9 |
| 44 | 6.8 | 13.7 | 20.5 | 27.3 | 34.2 | 41.0 | 47.8 | 54.7 | 61.5 | 68.4 |
| 45 | 7.2 | 14.4 | 21.6 | 28.8 | 36.0 | 43.2 | 50.4 | 57.6 | 64.8 | 72.0 |
| 46 | 7.6 | 15.2 | 22.7 | 30.3 | 37.9 | 45.5 | 53.0 | 60.6 | 68.2 | 75.8 |
| 47 | 8.0 | 15.9 | 23.9 | 31.9 | 39.9 | 47.8 | 55.8 | 63.8 | 71.7 | 79.7 |
| 48 | 8.4 | 16.8 | 25.1 | 33.5 | 41.9 | 50.3 | 58.7 | 67.1 | 75.4 | 83.8 |
| 49 | 8.8 | 17.6 | 26.4 | 35.3 | 44.1 | 52.9 | 61.7 | 70.5 | 79.3 | 88.1 |
| 50 | 9.3 | 18.5 | 27.8 | 37.1 | 46.3 | 55.6 | 64.8 | 74.1 | 83.4 | 92.6 |
| 51 | 9.7 | 19.5 | 29.2 | 38.9 | 48.7 | 58.4 | 68.1 | 77.9 | 87.6 | 97.3 |
| 52 | 10.2 | 20.4 | 30.7 | 40.9 | 51.1 | 61.3 | 71.6 | 81.8 | 92.0 | 102.2 |
| 53 | 10.7 | 21.5 | 32.2 | 42.9 | 53.7 | 64.4 | 75.1 | 85.9 | 96.6 | 107.3 |
| 54 | 11.3 | 22.5 | 33.8 | 45.1 | 56.3 | 67.6 | 78.9 | 90.1 | 101.4 | 112.7 |
| 55 | 11.8 | 23.6 | 35.5 | 47.3 | 59.1 | 70.9 | 82.7 | 94.6 | 106.4 | 118.2 |

TABLE 79.

## RATE OF DECREASE OF VAPOR PRESSURE WITH ALTITUDE FOR MOUNTAIN STATIONS.

(*According to the empirical formula of Dr. J. Hann.*)

$$\frac{e}{e_0} = 10^{-\frac{h}{6200}}$$

$e$, $e_0$ = Vapor pressures at an upper and a lower station respectively.
$h$ = Difference of altitude in meters.

| Difference of Altitude. | | $\frac{e}{e_0}$. | Difference of Altitude. | | $\frac{e}{e_0}$. | Difference of Altitude. | | $\frac{e}{e_0}$. |
|---|---|---|---|---|---|---|---|---|
| Meters. | Feet. | | Meters. | Feet. | | Meters. | Feet. | |
| 200 | 656 | 0.93 | 1800 | 5905 | 0.52 | 3400 | 11155 | 0.29 |
| 400 | 1312 | .86 | 2000 | 6562 | .48 | 3600 | 11811 | .27 |
| 600 | 1968 | .80 | 2200 | 7218 | .45 | 3800 | 12467 | .25 |
| 800 | 2625 | .75 | 2400 | 7874 | .42 | 4000 | 13123 | .23 |
| 1000 | 3281 | 0.69 | 2600 | 8530 | 0.39 | 4500 | 14764 | 0.19 |
| 1200 | 3937 | .64 | 2800 | 9186 | .36 | 5000 | 16404 | .16 |
| 1400 | 4593 | .60 | 3000 | 9842 | .33 | 5500 | 18045 | .13 |
| 1600 | 5249 | .56 | 3200 | 10499 | .31 | 6000 | 19685 | .11 |

TABLE 80.

## DEPTH OF WATER CORRESPONDING TO THE WEIGHT OF A CYLINDRICAL SNOW CORE 2.655 INCHES IN DIAMETER.

(One-fifth pound equals 1 inch.)

| Weight lbs. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. | Inches. |
| .0 | 0.00 | 0.05 | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 | 0.35 | 0.40 | 0.45 |
| .1 | 0.50 | 0.55 | 0.60 | 0.65 | 0.70 | 0.75 | 0.80 | 0.85 | 0.90 | 0.95 |
| .2 | 1.00 | 1.05 | 1.10 | 1.15 | 1.20 | 1.25 | 1.30 | 1.35 | 1.40 | 1.45 |
| .3 | 1.50 | 1.55 | 1.60 | 1.65 | 1.70 | 1.75 | 1.80 | 1.85 | 1.90 | 1.95 |
| .4 | 2.00 | 2.05 | 2.10 | 2.15 | 2.20 | 2.25 | 2.30 | 2.35 | 2.40 | 2.45 |
| .5 | 2.50 | 2.55 | 2.60 | 2.65 | 2.70 | 2.75 | 2.80 | 2.85 | 2.90 | 2.95 |
| .6 | 3.00 | 3.05 | 3.10 | 3.15 | 3.20 | 3.25 | 3.30 | 3.35 | 3.40 | 3.45 |
| .7 | 3.50 | 3.55 | 3.60 | 3.65 | 3.70 | 3.75 | 3.80 | 3.85 | 3.90 | 3.95 |
| .8 | 4.00 | 4.05 | 4.10 | 4.15 | 4.20 | 4.25 | 4.30 | 4.35 | 4.40 | 4.45 |
| .9 | 4.50 | 4.55 | 4.60 | 4.65 | 4.70 | 4.75 | 4.80 | 4.85 | 4.90 | 4.95 |
| 1.0 | 5.00 | 5.05 | 5.10 | 5.15 | 5.20 | 5.25 | 5.30 | 5.35 | 5.40 | 5.45 |
| 1.1 | 5.50 | 5.55 | 5.60 | 5.65 | 5.70 | 5.75 | 5.80 | 5.85 | 5.90 | 5.95 |
| 1.2 | 6.00 | 6.05 | 6.10 | 6.15 | 6.20 | 6.25 | 6.30 | 6.35 | 6.40 | 6.45 |
| 1.3 | 6.50 | 6.55 | 6.60 | 6.65 | 6.70 | 6.75 | 6.80 | 6.85 | 6.90 | 6.95 |
| 1.4 | 7.00 | 7.05 | 7.10 | 7.15 | 7.20 | 7.25 | 7.30 | 7.35 | 7.40 | 7.45 |
| 1.5 | 7.50 | 7.55 | 7.60 | 7.65 | 7.70 | 7.75 | 7.80 | 7.85 | 7.90 | 7.95 |
| 1.6 | 8.00 | 8.05 | 8.10 | 8.15 | 8.20 | 8.25 | 8.30 | 8.35 | 8.40 | 8.45 |
| 1.7 | 8.50 | 8.55 | 8.60 | 8.65 | 8.70 | 8.75 | 8.80 | 8.85 | 8.90 | 8.95 |
| 1.8 | 9.00 | 9.05 | 9.10 | 9.15 | 9.20 | 9.25 | 9.30 | 9.35 | 9.40 | 9.45 |
| 1.9 | 9.50 | 9.55 | 9.60 | 9.65 | 9.70 | 9.75 | 9.80 | 9.85 | 9.90 | 9.95 |
| 2.0 | 10.00 | 10.05 | 10.10 | 10.15 | 10.20 | 10.25 | 10.30 | 10.35 | 10.40 | 10.45 |
| 2.1 | 10.50 | 10.55 | 10.60 | 10.65 | 10.70 | 10.75 | 10.80 | 10.85 | 10.90 | 10.95 |
| 2.2 | 11.00 | 11.05 | 11.10 | 11.15 | 11.20 | 11.25 | 11.30 | 11.35 | 11.40 | 11.45 |
| 2.3 | 11.50 | 11.55 | 11.60 | 11.65 | 11.70 | 11.75 | 11.80 | 11.85 | 11.90 | 11.95 |
| 2.4 | 12.00 | 12.05 | 12.10 | 12.15 | 12.20 | 12.25 | 12.30 | 12.35 | 12.40 | 12.45 |
| 2.5 | 12.50 | 12.55 | 12.60 | 12.65 | 12.70 | 12.75 | 12.80 | 12.85 | 12.90 | 12.95 |
| 2.6 | 13.00 | 13.05 | 13.10 | 13.15 | 13.20 | 13.25 | 13.30 | 13.35 | 13.40 | 13.45 |
| 2.7 | 13.50 | 13.55 | 13.60 | 13.65 | 13.70 | 13.75 | 13.80 | 13.85 | 13.90 | 13.95 |
| 2.8 | 14.00 | 14.05 | 14.10 | 14.15 | 14.20 | 14.25 | 14.30 | 14.35 | 14.40 | 14.45 |
| 2.9 | 14.50 | 14.55 | 14.60 | 14.65 | 14.70 | 14.75 | 14.80 | 14.85 | 14.90 | 14.95 |

## DEPTH OF WATER CORRESPONDING TO THE WEIGHT OF SNOW (OR RAIN) COLLECTED IN AN 8-INCH GAGE. (One pound equals 0.5507 inch.)

| Weight Pounds. | .00 | .01 | .02 | .03 | .04 | .05 | .06 | .07 | .08 | .09 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. | Inch. |
| .0 | .00 | .01 | .01 | .02 | .02 | .03 | .03 | .04 | .04 | .05 |
| .1 | .06 | .06 | .07 | .07 | .08 | .08 | .09 | .09 | .10 | .10 |
| .2 | .11 | .12 | .12 | .13 | .13 | .14 | .14 | .15 | .15 | .16 |
| .3 | .17 | .17 | .18 | .18 | .19 | .19 | .20 | .20 | .21 | .22 |
| .4 | .22 | .23 | .23 | .24 | .24 | .25 | .25 | .26 | .26 | .27 |
| .5 | .28 | .28 | .29 | .29 | .30 | .30 | .31 | .31 | .32 | .33 |
| .6 | .33 | .34 | .34 | .35 | .35 | .36 | .36 | .37 | .38 | .38 |
| .7 | .39 | .39 | .40 | .40 | .41 | .41 | .42 | .43 | .43 | .44 |
| .8 | .44 | .45 | .45 | .46 | .46 | .47 | .47 | .48 | .49 | .49 |
| .9 | .50 | .50 | .51 | .51 | .52 | .52 | .53 | .54 | .54 | .55 |



## QUANTITY OF RAINFALL CORRESPONDING TO GIVEN DEPTHS.

| Depth of rainfall, inches. | Cubic inches per acre. | Cubic feet per acre. | Gallons per acre. | | Tons per acre (2000 pounds). (62° F.) |
|---|---|---|---|---|---|
| | | | United States or Queen Anne. | Imperial (British). | |
| 0.01 | 62726.4 | 36.3 | 271.5 | 226 | 1.1 |
| 0.02 | 125453. | 72.6 | 543. | 452 | 2.3 |
| 0.03 | 188179. | 108.9 | 815. | 678 | 3.4 |
| 0.04 | 250905. | 145.2 | 1086. | 904 | 4.5 |
| 0.05 | 313632. | 181.5 | 1358. | 1130 | 5.6 |
| 0.06 | 376358. | 217.8 | 1629. | 1356 | 6.8 |
| 0.07 | 439084. | 254.1 | 1900. | 1582 | 7.9 |
| 0.08 | 501810. | 290.4 | 2171. | 1808 | 9.0 |
| 0.09 | 564536. | 326.7 | 2442. | 2034 | 10.1 |
| 0.10 | 627264. | 363.0 | 2715. | 2261 | 11.3 |
| 0.25 | 1568160. | 907.5 | 6789. | 5652 | 28. |
| 0.50 | 3136320. | 1815. | 13577. | 11303 | 56. |
| 0.75 | 4704480. | 2722. | 20366. | 16955 | 85. |
| 1.00 | 6272640. | 3630. | 27154. | 22607 | 113. |
| 1.25 | 7840800. | 4538. | 33943. | 28259 | 141. |
| 1.50 | 9408960. | 5445. | 40371. | 33911 | 170. |
| 1.75 | 10977120. | 6352. | 47520. | 39563 | 198. |
| 2.00 | 12545280. | 7260. | 54309. | 45214 | 226. |
| 2.25 | 14113440. | 8168. | 61097. | 50866 | 255. |
| 2.50 | 15681600. | 9075. | 67866. | 56517 | 283. |
| 2.75 | 17249760. | 9982. | 74674. | 62169 | 311. |
| 3.00 | 18817920. | 10890. | 81463. | 67821 | 339. |
| 4.00 | 25090560. | 14520. | 108617. | 90428 | 452. |
| 5.00 | 31363200. | 18150 | 135772. | 113035 | 565. |
| 6.00 | 37635840. | 21780. | 162926. | 135642 | 678. |

## GEODETICAL TABLES.


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## VALUE OF GRAVITY ON THE EARTH AT SEA LEVEL.

$$g_\phi = 978.039\,(1 + 0.005294\,\sin^2\phi - 0.000007\,\sin^2 2\phi)$$
$$= 980.621\,(1 - 0.002640\,\cos 2\phi + 0.000007\,\cos^2 2\phi)$$

| $\phi$ | $g_\phi$ | $\phi$ | $g_\phi$ | $\phi$ | $g_\phi$ | $\phi$ | $g_\phi$ | $\phi$ | $g_\phi$ |
|---|---|---|---|---|---|---|---|---|---|
| ° ′ | Dynes. | ° ′ | Dynes. | ° ′ | Dynes. | ° ′ | Dynes. | ° ′ | Dynes. |
| 0 0 | 978.039 | 20 00 | 978.642 | 37 00 | 979.908 | 54 00 | 981.422 | 71 00 | 982.665 |
| 1 0 | .041 | 20 | .661 | 20 | .937 | 20 | .450 | 20 | .684 |
| 2 0 | .045 | 40 | .681 | 40 | .966 | 40 | .479 | 40 | .702 |
| 3 0 | .053 | 21 00 | .701 | 38 00 | .995 | 55 00 | .507 | 72 00 | .720 |
| 4 0 | .064 | 20 | .721 | 20 | 980.024 | 20 | .535 | 20 | .738 |
| | | 40 | .742 | 40 | .054 | 40 | .564 | 40 | .755 |
| 5 00 | .078 | 22 00 | .762 | 39 00 | .083 | 56 00 | .592 | 73 00 | .772 |
| 20 | .084 | 20 | .783 | 20 | .113 | 20 | .620 | 20 | .789 |
| 40 | .089 | 40 | .805 | 40 | .142 | 40 | .647 | 40 | .805 |
| 6 00 | .095 | 23 00 | .826 | 40 00 | .172 | 57 00 | .675 | 74 00 | .822 |
| 20 | .102 | 20 | .848 | 20 | .201 | 20 | .703 | 20 | .837 |
| 40 | .108 | 40 | .870 | 40 | .231 | 40 | .730 | 40 | .853 |
| 7 00 | .115 | 24 00 | .892 | 41 00 | .261 | 58 00 | .757 | 75 00 | .868 |
| 20 | .123 | 20 | .914 | 20 | .291 | 20 | .784 | 20 | .883 |
| 40 | .131 | 40 | .937 | 40 | .321 | 40 | .811 | 40 | .898 |
| 8 00 | .139 | 25 00 | .960 | 42 00 | .350 | 59 00 | .838 | 76 00 | .912 |
| 20 | .147 | 20 | .983 | 20 | .380 | 20 | .865 | 20 | .926 |
| 40 | .156 | 40 | 979.006 | 40 | .410 | 40 | .891 | 40 | .940 |
| 9 00 | .165 | 26 00 | .030 | 43 00 | .440 | 60 00 | .917 | 77 00 | .953 |
| 20 | .174 | 20 | .054 | 20 | .471 | 20 | .943 | 20 | .966 |
| 40 | .184 | 40 | .077 | 40 | .501 | 40 | .969 | 40 | .979 |
| 10 00 | .194 | 27 00 | .102 | 44 00 | .531 | 61 00 | .995 | 78 00 | .992 |
| 20 | .205 | 20 | .126 | 20 | .561 | 20 | 982.020 | 20 | 983.004 |
| 40 | .215 | 40 | .151 | 40 | .591 | 40 | .046 | 40 | .016 |
| 11 00 | .227 | 28 00 | .175 | 45 00 | .621 | 62 00 | .071 | 79 00 | .027 |
| 20 | .238 | 20 | .201 | 20 | .651 | 20 | .096 | 20 | .039 |
| 40 | .250 | 40 | .226 | 40 | .681 | 40 | .121 | 40 | .049 |
| 12 00 | .262 | 29 00 | .251 | 46 00 | .711 | 63 00 | .145 | 80 00 | .060 |
| 20 | .274 | 20 | .277 | 20 | .741 | 20 | .169 | 20 | .070 |
| 40 | .287 | 40 | .302 | 40 | .772 | 40 | .194 | 40 | 080 |
| 13 00 | .300 | 30 00 | .328 | 47 00 | .802 | 64 00 | .217 | 81 00 | .090 |
| 20 | .313 | 20 | .354 | 20 | .832 | 20 | .241 | 20 | .099 |
| 40 | .327 | 40 | .381 | 40 | .862 | 40 | .265 | 40 | .108 |
| 14 00 | .341 | 31 00 | .407 | 48 00 | .892 | 65 00 | .288 | 82 00 | .116 |
| 20 | .355 | 20 | .434 | 20 | .922 | 20 | .311 | 20 | .124 |
| 40 | .369 | 40 | .460 | 40 | .952 | 40 | .334 | 40 | .132 |
| 15 00 | .384 | 32 00 | .487 | 49 00 | .981 | 66 00 | .356 | 83 00 | .140 |
| 20 | .399 | 20 | .515 | 20 | 981.011 | 20 | .379 | 20 | .147 |
| 40 | .415 | 40 | .542 | 40 | .041 | 40 | .401 | 40 | .153 |
| 16 00 | .430 | 33 00 | .569 | 50 00 | .071 | 67 00 | .423 | 84 00 | .160 |
| 20 | .447 | 20 | .597 | 20 | .100 | 20 | .445 | 20 | .166 |
| 40 | .463 | 40 | .624 | 40 | .130 | 40 | .466 | 40 | .172 |
| 17 00 | .479 | 34 00 | .652 | 51 00 | .160 | 68 00 | .487 | 85 00 | .177 |
| 20 | .496 | 20 | .680 | 20 | .189 | 20 | .508 | 20 | .182 |
| 40 | .514 | 40 | .708 | 40 | .218 | 40 | .528 | 40 | .187 |
| 18 00 | .531 | 35 00 | .736 | 52 00 | .248 | 69 00 | .549 | | |
| 20 | .549 | 20 | .765 | 20 | .277 | 20 | .569 | 86 00 | .192 |
| 40 | .567 | 40 | .793 | 40 | .306 | 40 | .589 | 87 00 | .203 |
| 19 00 | .585 | 36 00 | .822 | 53 00 | .335 | 70 00 | .608 | 88 00 | .210 |
| 20 | .604 | 20 | .850 | 20 | .364 | 20 | .628 | 89 00 | .215 |
| 40 | 978.623 | 40 | 979.879 | 40 | 981.393 | 40 | 982.647 | 90 00 | 983.217 |

## RELATIVE ACCELERATION OF GRAVITY AT DIFFERENT LATITUDES.

Ratio of the acceleration of gravity at sea level for each 10′ of latitude, to its acceleration at latitude 45°.

$$\frac{g_\phi}{g_{45}} = 1 - 0.002640 \cos 2\phi + 0.000007 \cos^2 2\phi$$

| Latitude. $\phi$ | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ |
|---|---|---|---|---|---|---|
| 0° | 0.997367 | 0.997367 | 0.997367 | 0.997367 | 0.997368 | 0.997368 |
| 1 | .997369 | .997369 | .997370 | .997371 | .997371 | .997372 |
| 2 | .997373 | .997374 | .997376 | .997377 | .997378 | .997380 |
| 3 | .997381 | .997383 | .997385 | .997387 | .997388 | .997390 |
| 4 | .997393 | .997395 | .997397 | .997399 | .997402 | .997404 |
| 5 | 0.997407 | 0.997410 | 0.997412 | 0.997415 | 0.997418 | 0.997421 |
| 6 | .997424 | .997428 | .997431 | .997434 | .997438 | .997441 |
| 7 | .997445 | .997449 | .997453 | .997456 | .997460 | .997465 |
| 8 | .997469 | .997473 | .997477 | .997482 | .997486 | .997491 |
| 9 | .997496 | .997500 | .997505 | .997510 | .997515 | .997520 |
| 10 | 0.997525 | 0.997531 | 0.997536 | 0.997541 | 0.997547 | 0.997553 |
| 11 | .997558 | .997564 | .997570 | .997576 | .997582 | .997588 |
| 12 | .997594 | .997600 | .997607 | .997613 | .997620 | .997626 |
| 13 | .997633 | .997640 | .997646 | .997653 | .997660 | .997667 |
| 14 | .997674 | .997682 | .997689 | .997696 | .997704 | .997711 |
| 15 | 0.997719 | 0.997727 | 0.997734 | 0.997742 | 0.997750 | 0.997758 |
| 16 | .997766 | .997774 | .997783 | .997791 | .997799 | .997808 |
| 17 | .997816 | .997825 | .997833 | .997842 | .997851 | .997860 |
| 18 | .997869 | .997878 | .997887 | .997896 | .997905 | .997915 |
| 19 | .997924 | .997934 | .997943 | .997953 | .997962 | .997972 |
| 20 | 0.997982 | 0.997992 | 0.998002 | 0.998012 | 0.998022 | 0.998032 |
| 21 | .998042 | .998052 | .998063 | .998073 | .998084 | .998094 |
| 22 | .998104 | .998115 | .998126 | .998137 | .998148 | .998159 |
| 23 | .998170 | .998181 | .998192 | .998203 | .998214 | .998225 |
| 24 | .998237 | .998248 | .998260 | .998271 | .998283 | .998294 |
| 25 | 0.998306 | 0.998318 | 0.998330 | 0.998341 | 0.998353 | 0.998365 |
| 26 | .998377 | .998389 | .998402 | .998414 | .998426 | .998438 |
| 27 | .998451 | .998463 | .998476 | .998488 | .998501 | .998513 |
| 28 | .998526 | .998539 | .998551 | .998564 | .998577 | .998590 |
| 29 | .998603 | .998616 | .998629 | .998642 | .998655 | .998669 |
| 30 | 0.998682 | 0.998695 | 0.998708 | 0.998722 | 0.998735 | 0.998749 |
| 31 | .998762 | .998776 | .998789 | .998803 | .998817 | .998830 |
| 32 | .998844 | .998858 | .998872 | .998886 | .998899 | .998913 |
| 33 | .998927 | .998941 | .998956 | .998970 | .998984 | .998998 |
| 34 | .999012 | .999026 | .999041 | .999055 | .999069 | .999084 |
| 35 | 0.999098 | 0.999112 | 0.999127 | 0.999141 | 0.999156 | 0.999170 |
| 36 | .999185 | .999199 | .999214 | .999229 | .999243 | .999258 |
| 37 | .999273 | .999288 | .999302 | .999317 | .999332 | .999347 |
| 38 | .999362 | .999377 | .999392 | .999406 | .999421 | .999436 |
| 39 | .999451 | .999466 | .999482 | .999497 | .999512 | .999527 |
| 40 | 0.999542 | 0.999557 | 0.999572 | 0.999587 | 0.999602 | 0.999618 |
| 41 | .999633 | .999648 | .999663 | .999678 | .999694 | .999709 |
| 42 | .999724 | .999739 | .999755 | .999770 | .999785 | .999801 |
| 43 | .999816 | .999831 | .999847 | .999862 | .999877 | .999893 |
| 44 | .999908 | .999923 | .999939 | .999954 | .999969 | .999985 |
| 45 | 1.000000 | 1.000015 | 1.000031 | 1.000046 | 1.000061 | 1.000077 |

TABLE 84.

## RELATIVE ACCELERATION OF GRAVITY AT DIFFERENT LATITUDES.

Ratio of the acceleration of gravity at sea level for each 10′ of latitude, to its acceleration at latitude 45°.

$$\frac{g_\phi}{g_{45}} = 1 - 0.002640 \cos 2\phi + 0.000007 \cos^2 2\phi$$

| Latitude. $\phi$ | 0′ | 10′ | 20′ | 30′ | 40′ | 50′ |
|---|---|---|---|---|---|---|
| 45 | 1.000000 | 1.000015 | 1.000031 | 1.000046 | 1.000061 | 1.000077 |
| 46 | 092 | 108 | 123 | 138 | 153 | 169 |
| 47 | 184 | 200 | 215 | 230 | 246 | 261 |
| 48 | 276 | 291 | 307 | 322 | 337 | 352 |
| 49 | 368 | 383 | 398 | 413 | 428 | 444 |
| 50 | 1.000459 | 1.000474 | 1.000489 | 1.000504 | 1.000519 | 1.000534 |
| 51 | 549 | 564 | 579 | 594 | 609 | 624 |
| 52 | 639 | 654 | 669 | 684 | 699 | 713 |
| 53 | 728 | 743 | 758 | 773 | 787 | 802 |
| 54 | 816 | 831 | 846 | 860 | 875 | 889 |
| 55 | 1.000904 | 1.000918 | 1.000933 | 1.000947 | 1.000961 | 1.000976 |
| 56 | 0990 | 1004 | 1018 | 1033 | 1047 | 1061 |
| 57 | 1075 | 1089 | 1103 | 1117 | 1131 | 1145 |
| 58 | 1159 | 1173 | 1186 | 1200 | 1214 | 1227 |
| 59 | 1241 | 1255 | 1268 | 1282 | 1295 | 1308 |
| 60 | 1.001322 | 1.001335 | 1.001348 | 1.001362 | 1.001375 | 1.001388 |
| 61 | 1401 | 1414 | 1427 | 1440 | 1453 | 1466 |
| 62 | 1478 | 1491 | 1504 | 1517 | 1529 | 1542 |
| 63 | 1554 | 1567 | 1579 | 1591 | 1604 | 1616 |
| 64 | 1628 | 1640 | 1652 | 1664 | 1676 | 1688 |
| 65 | 1.001700 | 1.001712 | 1.001723 | 1.001735 | 1.001747 | 1.001758 |
| 66 | 1770 | 1781 | 1792 | 1804 | 1815 | 1826 |
| 67 | 1837 | 1848 | 1859 | 1870 | 1881 | 1892 |
| 68 | 1903 | 1913 | 1924 | 1935 | 1945 | 1955 |
| 69 | 1966 | 1976 | 1986 | 1996 | 2007 | 2017 |
| 70 | 1.002026 | 1.002036 | 1.002046 | 1.002056 | 1.002066 | 1.002075 |
| 71 | 2085 | 2094 | 2104 | 2113 | 2122 | 2131 |
| 72 | 2140 | 2149 | 2158 | 2167 | 2176 | 2185 |
| 73 | 2194 | 2202 | 2211 | 2219 | 2227 | 2236 |
| 74 | 2244 | 2252 | 2260 | 2268 | 2276 | 2284 |
| 75 | 1.002292 | 1.002299 | 1.002307 | 1.002314 | 1.002322 | 1.002329 |
| 76 | 2336 | 2344 | 2351 | 2358 | 2365 | 2372 |
| 77 | 2378 | 2385 | 2392 | 2398 | 2405 | 2411 |
| 78 | 2418 | 2424 | 2430 | 2436 | 2442 | 2448 |
| 79 | 2454 | 2460 | 2465 | 2471 | 2476 | 2482 |
| 80 | 1.002487 | 1.002492 | 1.002497 | 1.002502 | 1.002507 | 1.002512 |
| 81 | 2517 | 2522 | 2527 | 2531 | 2536 | 2540 |
| 82 | 2544 | 2548 | 2553 | 2557 | 2561 | 2564 |
| 83 | 2568 | 2572 | 2576 | 2579 | 2582 | 2586 |
| 84 | 2589 | 2592 | 2595 | 2598 | 2601 | 2604 |
| 85 | 1.002607 | 1.002609 | 1.002612 | 1.002614 | 1.002617 | 1.002619 |
| 86 | 2621 | 2623 | 2625 | 2627 | 2629 | 2631 |
| 87 | 2632 | 2634 | 2636 | 2637 | 2638 | 2639 |
| 88 | 2641 | 2642 | 2643 | 2643 | 2644 | 2645 |
| 89 | 2645 | 2646 | 2646 | 2647 | 2647 | 2647 |
| 90 | 1.002647 | | | | | |

## LENGTH OF ONE DEGREE OF THE MERIDIAN AT DIFFERENT LATITUDES.

| Latitude. | Meters. | Statute Miles. | Geographic Miles. 1′ of the Eq. | Latitude. | Meters. | Statute Miles. | Geographic Miles. 1′ of the Eq. |
|---|---|---|---|---|---|---|---|
| 0° | 110 568.5 | 68.703 | 59.594 | 45° | 111 132.1 | 69.054 | 59.898 |
| 1 | 110 568.8 | 68.704 | 59.594 | 46 | 111 151.9 | 69.067 | 59.908 |
| 2 | 110 569.8 | 68.705 | 59.595 | 47 | 111 171.6 | 69.079 | 59.919 |
| 3 | 110 571.5 | 68.706 | 59.596 | 48 | 111 191.3 | 69.091 | 59.929 |
| 4 | 110 573.9 | 68.707 | 59.597 | 49 | 111 210.9 | 69.103 | 59.940 |
| 5 | 110 577.0 | 68.709 | 59.598 | 50 | 111 230.5 | 69.115 | 59.951 |
| 6 | 110 580.7 | 68.711 | 59.600 | 51 | 111 249.9 | 69.127 | 59.961 |
| 7 | 110 585.1 | 68.714 | 59.603 | 52 | 111 269.2 | 69.139 | 59.972 |
| 8 | 110 590.2 | 68.717 | 59.606 | 53 | 111 288.3 | 69.151 | 59.982 |
| 9 | 110 595.9 | 68.721 | 59.609 | 54 | 111 307.3 | 69.163 | 59.992 |
| 10 | 110 602.3 | 68.725 | 59.612 | 55 | 111 326.0 | 69.175 | 60.002 |
| 11 | 110 609.3 | 68.729 | 59.616 | 56 | 111 344.5 | 69.186 | 60.012 |
| 12 | 110 617.0 | 68.734 | 59.620 | 57 | 111 362.7 | 69.198 | 60.022 |
| 13 | 110 625.3 | 68.739 | 59.625 | 58 | 111 380.7 | 69.209 | 60.032 |
| 14 | 110 634.2 | 68.745 | 59.629 | 59 | 111 398.4 | 69.220 | 60.041 |
| 15 | 110 643.7 | 68.751 | 59.634 | 60 | 111 415.7 | 69.230 | 60.051 |
| 16 | 110 653.8 | 68.757 | 59.640 | 61 | 111 432.7 | 69.241 | 60.060 |
| 17 | 110 664.5 | 68.763 | 59.646 | 62 | 111 449.4 | 69.251 | 60.069 |
| 18 | 110 675.7 | 68.770 | 59.652 | 63 | 111 465.7 | 69.261 | 60.077 |
| 19 | 110 687.5 | 68.778 | 59.658 | 64 | 111 481.5 | 69.271 | 60.086 |
| 20 | 110 699.9 | 68.786 | 59.665 | 65 | 111 497.0 | 69.281 | 60.094 |
| 21 | 110 712.8 | 68.794 | 59.672 | 66 | 111 512.0 | 69.290 | 60.102 |
| 22 | 110 726.2 | 68.802 | 59.679 | 67 | 111 526.5 | 69.299 | 60.110 |
| 23 | 110 740.1 | 68.810 | 59.686 | 68 | 111 540.5 | 69.308 | 60.118 |
| 24 | 110 754.4 | 68.819 | 59.694 | 69 | 111 554.1 | 69.316 | 60.125 |
| 25 | 110 769.2 | 68.829 | 59.702 | 70 | 111 567.1 | 69.324 | 60.132 |
| 26 | 110 784.5 | 68.838 | 59.710 | 71 | 111 579.7 | 69.332 | 60.139 |
| 27 | 110 800.2 | 68.848 | 59.719 | 72 | 111 591.6 | 69.340 | 60.145 |
| 28 | 110 816.3 | 68.858 | 59.727 | 73 | 111 603.0 | 69.347 | 60.151 |
| 29 | 110 832.8 | 68.868 | 59.736 | 74 | 111 613.9 | 69.354 | 60.157 |
| 30 | 110 849.7 | 68.879 | 59.745 | 75 | 111 624.1 | 69.360 | 60.163 |
| 31 | 110 866.9 | 68.889 | 59.755 | 76 | 111 633.8 | 69.366 | 60.168 |
| 32 | 110 884.4 | 68.900 | 59.764 | 77 | 111 642.8 | 69.372 | 60.173 |
| 33 | 110 902.3 | 68.911 | 59.774 | 78 | 111 651.2 | 69.377 | 60.177 |
| 34 | 110 920.4 | 68.923 | 59.784 | 79 | 111 659.0 | 69.382 | 60.182 |
| 35 | 110 938.8 | 68.934 | 59.794 | 80 | 111 666.2 | 69.386 | 60.186 |
| 36 | 110 957.4 | 68.946 | 59.804 | 81 | 111 672.6 | 69.390 | 60.189 |
| 37 | 110 976.3 | 68.957 | 59.814 | 82 | 111 678.5 | 69.394 | 60.192 |
| 38 | 110 995.3 | 68.969 | 59.824 | 83 | 111 683.6 | 69.397 | 60.195 |
| 39 | 111 014.5 | 68.981 | 59.834 | 84 | 111 688.1 | 69.400 | 60.197 |
| 40 | 111 033.9 | 68.993 | 59.845 | 85 | 111 691.9 | 69.402 | 60.199 |
| 41 | 111 053.4 | 69.005 | 59.855 | 86 | 111 695.0 | 69.404 | 60.201 |
| 42 | 111 073.0 | 69.017 | 59.866 | 87 | 111 697.4 | 69.405 | 60.202 |
| 43 | 111 092.6 | 69.029 | 59.876 | 88 | 111 699.2 | 69.407 | 60.203 |
| 44 | 111 112.4 | 69.042 | 59.887 | 89 | 111 700.2 | 69.407 | 60.204 |
| 45 | 111 132.1 | 69.054 | 59.898 | 90 | 111 700.6 | 69.407 | 60.204 |

## LENGTH OF ONE DEGREE OF THE PARALLEL AT DIFFERENT LATITUDES.

| Latitude. | Meters. | Statute Miles. | Geographic Miles. 1′ of the Eq. | Latitude. | Meters. | Statute Miles. | Geographic Miles. 1′ of the Eq. |
|---|---|---|---|---|---|---|---|
| 0° | 111 321.9 | 69.171 | 60.000 | 45° | 78 850.0 | 48.995 | 42.498 |
| 1 | 111 305.2 | 69.162 | 59.991 | 46 | 77 466.5 | 48.135 | 41.753 |
| 2 | 111 254.6 | 69.130 | 59.964 | 47 | 76 059.2 | 47.261 | 40.994 |
| 3 | 111 170.4 | 69.078 | 59.918 | 48 | 74 628.5 | 46.372 | 40.223 |
| 4 | 111 052.6 | 69.005 | 59.855 | 49 | 73 174.9 | 45.469 | 39.440 |
| 5 | 110 901.2 | 68.911 | 59.773 | 50 | 71 698.9 | 44.552 | 38.644 |
| 6 | 110 716.2 | 68.796 | 59.673 | 51 | 70 200.8 | 43.621 | 37.837 |
| 7 | 110 497.7 | 68.660 | 59.556 | 52 | 68 681.1 | 42.676 | 37.018 |
| 8 | 110 245.8 | 68.503 | 59.420 | 53 | 67 140.3 | 41.719 | 36.187 |
| 9 | 109 960.5 | 68.326 | 59.266 | 54 | 65 578.8 | 40.749 | 35.346 |
| 10 | 109 641.9 | 68.128 | 59.095 | 55 | 63 997.1 | 39.766 | 34.493 |
| 11 | 109 290.1 | 67.909 | 58.905 | 56 | 62 395.7 | 38.771 | 33.630 |
| 12 | 108 905.2 | 67.670 | 58.697 | 57 | 60 775.1 | 37.764 | 32.757 |
| 13 | 108 487.3 | 67.411 | 58.472 | 58 | 59 135.7 | 36.745 | 31.873 |
| 14 | 108 036.6 | 67.131 | 58.229 | 59 | 57 478.1 | 35.715 | 30.979 |
| 15 | 107 553.1 | 66.830 | 57.969 | 60 | 55 802.8 | 34.674 | 30.076 |
| 16 | 107 037.0 | 66.510 | 57.690 | 61 | 54 110.2 | 33.622 | 29.164 |
| 17 | 106 488.5 | 66.169 | 57.395 | 62 | 52 400.9 | 32.560 | 28.243 |
| 18 | 105 907.7 | 65.808 | 57.082 | 63 | 50 675.4 | 31.488 | 27.313 |
| 19 | 105 294.7 | 65.427 | 56.751 | 64 | 48 934.3 | 30.406 | 26.374 |
| 20 | 104 649.8 | 65.026 | 56.404 | 65 | 47 178.0 | 29.315 | 25.428 |
| 21 | 103 973.2 | 64.606 | 56.039 | 66 | 45 407.1 | 28.215 | 24.473 |
| 22 | 103 265.0 | 64.166 | 55.657 | 67 | 43 622.2 | 27.106 | 23.511 |
| 23 | 102 525.4 | 63.706 | 55.259 | 68 | 41 823.8 | 25.988 | 22.542 |
| 24 | 101 754.6 | 63.227 | 54.843 | 69 | 40 012.4 | 24.862 | 21.566 |
| 25 | 100 953.0 | 62.729 | 54.411 | 70 | 38 188.6 | 23.729 | 20.583 |
| 26 | 100 120.6 | 62.212 | 53.963 | 71 | 36 353.0 | 22.589 | 19.593 |
| 27 | 99 257.8 | 61.676 | 53.498 | 72 | 34 506.2 | 21.441 | 18.598 |
| 28 | 98 364.8 | 61.121 | 53.016 | 73 | 32 648.6 | 20.287 | 17.597 |
| 29 | 97 441.9 | 60.548 | 52.519 | 74 | 30 780.9 | 19.126 | 16.590 |
| 30 | 96 489.3 | 59.956 | 52.006 | 75 | 28 903.6 | 17.960 | 15.578 |
| 31 | 95 507.3 | 59.345 | 51.476 | 76 | 27 017.4 | 16.788 | 14.562 |
| 32 | 94 496.2 | 58.717 | 50.931 | 77 | 25 122.8 | 15.611 | 13.541 |
| 33 | 93 456.3 | 58.071 | 50.371 | 78 | 23 220.4 | 14.428 | 12.515 |
| 34 | 92 387.9 | 57.407 | 49.795 | 79 | 21 310.8 | 13.242 | 11.486 |
| 35 | 91 291.3 | 56.726 | 49.204 | 80 | 19 394.6 | 12.051 | 10.453 |
| 36 | 90 166.8 | 56.027 | 48.598 | 81 | 17 472.4 | 10.857 | 9.417 |
| 37 | 89 014.8 | 55.311 | 47.977 | 82 | 15 544.7 | 9.659 | 8.378 |
| 38 | 87 835.6 | 54.578 | 47.341 | 83 | 13 612.2 | 8.458 | 7.337 |
| 39 | 86 629.6 | 53.829 | 46.691 | 84 | 11 675.5 | 7.255 | 6.293 |
| 40 | 85 397.0 | 53.063 | 46.027 | 85 | 9 735.1 | 6.049 | 5.247 |
| 41 | 84 138.4 | 52.281 | 45.349 | 86 | 7 791.7 | 4.841 | 4.200 |
| 42 | 82 854.0 | 51.483 | 44.656 | 87 | 5 845.9 | 3.632 | 3.151 |
| 43 | 81 544.2 | 50.669 | 43.950 | 88 | 3 898.3 | 2.422 | 2.101 |
| 44 | 80 209.4 | 49.840 | 43.231 | 89 | 1 949.4 | 1.211 | 1.051 |
| 45 | 78 850.0 | 48.995 | 42.498 | 90 | 0.0 | 0.000 | 0.000 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° |
|---|---|---|---|---|---|---|---|---|---|
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −23° 27′ | 12 7 | 11 50 | 11 32 | 11 14 | 10 55 | 10 35 | 10 13 | 9 48 | 9 19 |
| −23 20 | 12 7 | 11 50 | 11 32 | 11 14 | 10 56 | 10 36 | 10 14 | 9 49 | 9 20 |
| −23 0 | 12 7 | 11 50 | 11 33 | 11 15 | 10 57 | 10 37 | 10 15 | 9 51 | 9 23 |
| −22 40 | 12 7 | 11 50 | 11 33 | 11 16 | 10 58 | 10 38 | 10 17 | 9 53 | 9 26 |
| −22 20 | 12 7 | 11 51 | 11 34 | 11 17 | 10 59 | 10 40 | 10 19 | 9 55 | 9 29 |
| −22 0 | 12 7 | 11 51 | 11 34 | 11 18 | 11 0 | 10 41 | 10 20 | 9 58 | 9 31 |
| −21 40 | 12 7 | 11 51 | 11 35 | 11 19 | 11 1 | 10 43 | 10 22 | 10 0 | 9 34 |
| −21 20 | 12 7 | 11 52 | 11 35 | 11 19 | 11 2 | 10 44 | 10 24 | 10 2 | 9 37 |
| −21 0 | 12 7 | 11 52 | 11 36 | 11 20 | 11 4 | 10 46 | 10 26 | 10 4 | 9 40 |
| −20 40 | 12 7 | 11 52 | 11 37 | 11 21 | 11 5 | 10 47 | 10 28 | 10 6 | 9 42 |
| −20 20 | 12 7 | 11 52 | 11 37 | 11 22 | 11 6 | 10 49 | 10 29 | 10 8 | 9 45 |
| −20 0 | 12 7 | 11 53 | 11 38 | 11 23 | 11 7 | 10 50 | 10 31 | 10 11 | 9 47 |
| −19 40 | 12 7 | 11 53 | 11 38 | 11 23 | 11 8 | 10 51 | 10 33 | 10 13 | 9 50 |
| −19 20 | 12 7 | 11 53 | 11 39 | 11 24 | 11 9 | 10 53 | 10 35 | 10 15 | 9 53 |
| −19 0 | 12 7 | 11 53 | 11 39 | 11 25 | 11 10 | 10 54 | 10 37 | 10 17 | 9 55 |
| −18 40 | 12 7 | 11 54 | 11 40 | 11 26 | 11 11 | 10 55 | 10 38 | 10 19 | 9 58 |
| −18 20 | 12 7 | 11 54 | 11 40 | 11 27 | 11 12 | 10 57 | 10 40 | 10 21 | 10 1 |
| −18 0 | 12 7 | 11 54 | 11 41 | 11 28 | 11 13 | 10 58 | 10 42 | 10 23 | 10 3 |
| −17 40 | 12 7 | 11 54 | 11 41 | 11 28 | 11 14 | 10 59 | 10 43 | 10 26 | 10 5 |
| −17 20 | 12 7 | 11 55 | 11 42 | 11 29 | 11 15 | 11 1 | 10 45 | 10 28 | 10 8 |
| −17 0 | 12 7 | 11 55 | 11 42 | 11 30 | 11 16 | 11 2 | 10 47 | 10 30 | 10 10 |
| −16 40 | 12 7 | 11 55 | 11 43 | 11 31 | 11 17 | 11 4 | 10 49 | 10 32 | 10 13 |
| −16 20 | 12 7 | 11 55 | 11 43 | 11 31 | 11 18 | 11 5 | 10 50 | 10 34 | 10 16 |
| −16 0 | 12 7 | 11 56 | 11 44 | 11 32 | 11 19 | 11 6 | 10 52 | 10 36 | 10 18 |
| −15 40 | 12 7 | 11 56 | 11 44 | 11 33 | 11 20 | 11 8 | 10 53 | 10 38 | 10 20 |
| −15 20 | 12 7 | 11 56 | 11 45 | 11 34 | 11 21 | 11 9 | 10 55 | 10 40 | 10 23 |
| −15 0 | 12 7 | 11 56 | 11 45 | 11 34 | 11 22 | 11 10 | 10 57 | 10 42 | 10 25 |
| −14 40 | 12 7 | 11 57 | 11 46 | 11 35 | 11 23 | 11 11 | 10 59 | 10 44 | 10 28 |
| −14 20 | 12 7 | 11 57 | 11 46 | 11 36 | 11 25 | 11 13 | 11 0 | 10 46 | 10 30 |
| −14 0 | 12 7 | 11 57 | 11 47 | 11 37 | 11 26 | 11 14 | 11 2 | 10 48 | 10 32 |
| −13 40 | 12 7 | 11 57 | 11 47 | 11 37 | 11 27 | 11 16 | 11 4 | 10 50 | 10 35 |
| −13 20 | 12 7 | 11 58 | 11 48 | 11 38 | 11 28 | 11 17 | 11 5 | 10 52 | 10 37 |
| −13 0 | 12 7 | 11 58 | 11 48 | 11 39 | 11 29 | 11 18 | 11 7 | 10 54 | 10 40 |
| −12 40 | 12 7 | 11 58 | 11 49 | 11 40 | 11 30 | 11 19 | 11 8 | 10 56 | 10 42 |
| −12 20 | 12 7 | 11 58 | 11 49 | 11 40 | 11 31 | 11 21 | 11 10 | 10 58 | 10 44 |
| −12 0 | 12 7 | 11 58 | 11 50 | 11 41 | 11 32 | 11 22 | 11 11 | 11 0 | 10 47 |
| −11 40 | 12 7 | 11 59 | 11 50 | 11 42 | 11 33 | 11 23 | 11 13 | 11 2 | 10 49 |
| −11 20 | 12 7 | 11 59 | 11 51 | 11 43 | 11 34 | 11 25 | 11 15 | 11 4 | 10 52 |
| −11 0 | 12 7 | 11 59 | 11 51 | 11 43 | 11 35 | 11 26 | 11 16 | 11 6 | 10 54 |
| −10 40 | 12 7 | 11 59 | 11 52 | 11 44 | 11 36 | 11 27 | 11 18 | 11 8 | 10 56 |
| −10 20 | 12 7 | 12 0 | 11 52 | 11 45 | 11 37 | 11 28 | 11 20 | 11 10 | 10 59 |
| −10 0 | 12 7 | 12 0 | 11 53 | 11 46 | 11 38 | 11 30 | 11 21 | 11 12 | 11 1 |
| − 9 40 | 12 7 | 12 0 | 11 53 | 11 46 | 11 39 | 11 31 | 11 23 | 11 14 | 11 3 |
| − 9 20 | 12 7 | 12 0 | 11 54 | 11 47 | 11 40 | 11 32 | 11 24 | 11 16 | 11 5 |
| − 9 0 | 12 7 | 12 1 | 11 54 | 11 47 | 11 41 | 11 34 | 11 26 | 11 17 | 11 8 |
| − 8 40 | 12 7 | 12 1 | 11 55 | 11 48 | 11 42 | 11 35 | 11 28 | 11 19 | 11 10 |
| − 8 20 | 12 7 | 12 1 | 11 55 | 11 49 | 11 43 | 11 36 | 11 29 | 11 21 | 11 12 |
| − 8 0 | 12 7 | 12 1 | 11 56 | 11 50 | 11 44 | 11 37 | 11 31 | 11 23 | 11 14 |

# DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 42° | 44° | 46° | 48° | 50° | 52° | 54° | 56° | 58° | 60° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −23° 27′ | 9 7 | 8 53 | 8 38 | 8 22 | 8 4 | 7 44 | 7 22 | 6 56 | 6 27 | 5 52 |
| −23 20 | 9 8 | 8 54 | 8 39 | 8 23 | 8 5 | 7 45 | 7 24 | 6 58 | 6 29 | 5 54 |
| −23 0 | 9 11 | 8 58 | 8 43 | 8 28 | 8 10 | 7 50 | 7 29 | 7 4 | 6 36 | 6 2 |
| −22 40 | 9 14 | 9 1 | 8 46 | 8 31 | 8 14 | 7 55 | 7 34 | 7 10 | 6 43 | 6 9 |
| −22 20 | 9 17 | 9 4 | 8 50 | 8 35 | 8 18 | 8 0 | 7 39 | 7 16 | 6 49 | 6 17 |
| −22 0 | 9 20 | 9 7 | 8 53 | 8 38 | 8 22 | 8 4 | 7 44 | 7 22 | 6 55 | 6 25 |
| −21 40 | 9 23 | 9 10 | 8 57 | 8 42 | 8 26 | 8 9 | 7 49 | 7 27 | 7 1 | 6 32 |
| −21 20 | 9 26 | 9 13 | 9 1 | 8 46 | 8 30 | 8 13 | 7 54 | 7 32 | 7 8 | 6 38 |
| −21 0 | 9 28 | 9 17 | 9 4 | 8 50 | 8 34 | 8 18 | 7 59 | 7 38 | 7 14 | 6 46 |
| −20 40 | 9 31 | 9 20 | 9 7 | 8 53 | 8 38 | 8 22 | 8 4 | 7 43 | 7 20 | 6 52 |
| −20 20 | 9 34 | 9 23 | 9 11 | 8 57 | 8 42 | 8 26 | 8 8 | 7 49 | 7 25 | 6 59 |
| −20 0 | 9 37 | 9 26 | 9 14 | 9 1 | 8 46 | 8 31 | 8 13 | 7 54 | 7 31 | 7 5 |
| −19 40 | 9 40 | 9 29 | 9 17 | 9 4 | 8 50 | 8 35 | 8 18 | 7 59 | 7 37 | 7 12 |
| −19 20 | 9 43 | 9 32 | 9 20 | 9 7 | 8 54 | 8 39 | 8 23 | 8 4 | 7 43 | 7 18 |
| −19 0 | 9 46 | 9 35 | 9 24 | 9 11 | 8 58 | 8 43 | 8 27 | 8 9 | 7 48 | 7 25 |
| −18 40 | 9 48 | 9 38 | 9 27 | 9 15 | 9 2 | 8 47 | 8 32 | 8 14 | 7 54 | 7 31 |
| −18 20 | 9 51 | 9 41 | 9 30 | 9 19 | 9 6 | 8 52 | 8 36 | 8 19 | 7 59 | 7 37 |
| −18 0 | 9 54 | 9 44 | 9 34 | 9 22 | 9 10 | 8 56 | 8 41 | 8 24 | 8 5 | 7 43 |
| −17 40 | 9 56 | 9 47 | 9 37 | 9 25 | 9 13 | 9 0 | 8 45 | 8 29 | 8 10 | 7 49 |
| −17 20 | 9 59 | 9 50 | 9 40 | 9 29 | 9 17 | 9 4 | 8 50 | 8 34 | 8 15 | 7 55 |
| −17 0 | 10 2 | 9 53 | 9 43 | 9 32 | 9 21 | 9 8 | 8 54 | 8 38 | 8 20 | 8 1 |
| −16 40 | 10 5 | 9 56 | 9 46 | 9 35 | 9 25 | 9 12 | 8 58 | 8 43 | 8 26 | 8 6 |
| −16 20 | 10 7 | 9 59 | 9 49 | 9 39 | 9 28 | 9 16 | 9 2 | 8 47 | 8 31 | 8 12 |
| −16 0 | 10 10 | 10 1 | 9 52 | 9 43 | 9 32 | 9 20 | 9 7 | 8 52 | 8 36 | 8 17 |
| −15 40 | 10 12 | 10 4 | 9 55 | 9 46 | 9 35 | 9 24 | 9 11 | 8 57 | 8 41 | 8 23 |
| −15 20 | 10 15 | 10 7 | 9 58 | 9 49 | 9 39 | 9 28 | 9 15 | 9 2 | 8 46 | 8 29 |
| −15 0 | 10 18 | 10 10 | 10 1 | 9 52 | 9 43 | 9 31 | 9 19 | 9 6 | 8 51 | 8 34 |
| −14 40 | 10 20 | 10 13 | 10 4 | 9 56 | 9 46 | 9 35 | 9 23 | 9 11 | 8 56 | 8 40 |
| −14 20 | 10 23 | 10 16 | 10 7 | 9 59 | 9 49 | 9 39 | 9 28 | 9 15 | 9 1 | 8 45 |
| −14 0 | 10 26 | 10 19 | 10 10 | 10 2 | 9 53 | 9 43 | 9 32 | 9 19 | 9 6 | 8 50 |
| −13 40 | 10 28 | 10 21 | 10 13 | 10 5 | 9 56 | 9 47 | 9 36 | 9 24 | 9 11 | 8 56 |
| −13 20 | 10 31 | 10 24 | 10 16 | 10 8 | 10 0 | 9 50 | 9 40 | 9 28 | 9 16 | 9 1 |
| −13 0 | 10 33 | 10 26 | 10 19 | 10 11 | 10 3 | 9 54 | 9 44 | 9 33 | 9 20 | 9 6 |
| −12 40 | 10 36 | 10 29 | 10 22 | 10 15 | 10 7 | 9 58 | 9 48 | 9 37 | 9 25 | 9 11 |
| −12 20 | 10 38 | 10 32 | 10 25 | 10 18 | 10 10 | 10 1 | 9 52 | 9 41 | 9 30 | 9 17 |
| −12 0 | 10 41 | 10 35 | 10 28 | 10 21 | 10 13 | 10 5 | 9 56 | 9 46 | 9 35 | 9 22 |
| −11 40 | 10 44 | 10 38 | 10 31 | 10 25 | 10 17 | 10 9 | 10 0 | 9 50 | 9 39 | 9 27 |
| −11 20 | 10 46 | 10 40 | 10 34 | 10 28 | 10 20 | 10 13 | 10 4 | 9 55 | 9 44 | 9 32 |
| −11 0 | 10 49 | 10 43 | 10 37 | 10 31 | 10 23 | 10 16 | 10 8 | 9 59 | 9 49 | 9 37 |
| −10 40 | 10 51 | 10 46 | 10 40 | 10 34 | 10 27 | 10 19 | 10 12 | 10 3 | 9 53 | 9 42 |
| −10 20 | 10 53 | 10 49 | 10 43 | 10 37 | 10 31 | 10 23 | 10 16 | 10 7 | 9 58 | 9 47 |
| −10 0 | 10 56 | 10 51 | 10 46 | 10 40 | 10 34 | 10 27 | 10 19 | 10 11 | 10 3 | 9 52 |
| − 9 40 | 10 59 | 10 54 | 10 49 | 10 43 | 10 37 | 10 31 | 10 23 | 10 16 | 10 7 | 9 57 |
| − 9 20 | 11 1 | 10 56 | 10 52 | 10 46 | 10 40 | 10 34 | 10 27 | 10 20 | 10 11 | 10 2 |
| − 9 0 | 11 3 | 10 59 | 10 55 | 10 49 | 10 44 | 10 37 | 10 31 | 10 24 | 10 16 | 10 7 |
| − 8 40 | 11 6 | 11 2 | 10 57 | 10 52 | 10 47 | 10 41 | 10 34 | 10 28 | 10 20 | 10 11 |
| − 8 20 | 11 8 | 11 4 | 11 0 | 10 55 | 10 50 | 10 44 | 10 38 | 10 32 | 10 25 | 10 16 |
| − 8 0 | 11 10 | 11 7 | 11 3 | 10 58 | 10 53 | 10 48 | 10 42 | 10 36 | 10 29 | 10 21 |

# DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −8° 0′ | 12 7 | 12 1 | 11 55 | 11 50 | 11 44 | 11 37 | 11 31 | 11 23 | 11 14 |
| −7 40 | 12 7 | 12 1 | 11 56 | 11 50 | 11 45 | 11 38 | 11 32 | 11 25 | 11 17 |
| −7 20 | 12 7 | 12 1 | 11 56 | 11 51 | 11 46 | 11 40 | 11 34 | 11 27 | 11 19 |
| −7 0 | 12 7 | 12 2 | 11 57 | 11 52 | 11 47 | 11 41 | 11 35 | 11 29 | 11 22 |
| −6 40 | 12 7 | 12 2 | 11 57 | 11 53 | 11 48 | 11 42 | 11 37 | 11 31 | 11 24 |
| −6 20 | 12 7 | 12 2 | 11 58 | 11 53 | 11 49 | 11 43 | 11 38 | 11 32 | 11 26 |
| −6 0 | 12 7 | 12 2 | 11 58 | 11 54 | 11 50 | 11 45 | 11 40 | 11 34 | 11 28 |
| −5 40 | 12 7 | 12 3 | 11 59 | 11 55 | 11 51 | 11 46 | 11 41 | 11 36 | 11 31 |
| −5 20 | 12 7 | 12 3 | 11 59 | 11 55 | 11 52 | 11 47 | 11 43 | 11 38 | 11 33 |
| −5 0 | 12 7 | 12 3 | 12 0 | 11 56 | 11 53 | 11 49 | 11 44 | 11 40 | 11 35 |
| −4 40 | 12 7 | 12 3 | 12 0 | 11 57 | 11 54 | 11 50 | 11 46 | 11 42 | 11 37 |
| −4 20 | 12 7 | 12 4 | 12 1 | 11 58 | 11 55 | 11 51 | 11 47 | 11 44 | 11 40 |
| −4 0 | 12 7 | 12 4 | 12 1 | 11 58 | 11 56 | 11 52 | 11 49 | 11 46 | 11 42 |
| −3 40 | 12 7 | 12 4 | 12 2 | 11 59 | 11 57 | 11 53 | 11 51 | 11 47 | 11 44 |
| −3 20 | 12 7 | 12 4 | 12 2 | 12 0 | 11 58 | 11 55 | 11 52 | 11 49 | 11 46 |
| −3 0 | 12 7 | 12 5 | 12 3 | 12 1 | 11 58 | 11 56 | 11 54 | 11 51 | 11 49 |
| −2 40 | 12 7 | 12 5 | 12 3 | 12 1 | 11 59 | 11 58 | 11 55 | 11 53 | 11 51 |
| −2 20 | 12 7 | 12 5 | 12 4 | 12 2 | 12 0 | 11 59 | 11 57 | 11 55 | 11 53 |
| −2 0 | 12 7 | 12 5 | 12 4 | 12 3 | 12 1 | 12 0 | 11 58 | 11 57 | 11 55 |
| −1 40 | 12 7 | 12 5 | 12 4 | 12 4 | 12 2 | 12 1 | 12 0 | 11 59 | 11 58 |
| −1 20 | 12 7 | 12 6 | 12 5 | 12 4 | 12 3 | 12 2 | 12 2 | 12 1 | 12 0 |
| −1 0 | 12 7 | 12 6 | 12 5 | 12 5 | 12 4 | 12 4 | 12 3 | 12 2 | 12 2 |
| −0 40 | 12 7 | 12 6 | 12 6 | 12 5 | 12 5 | 12 5 | 12 5 | 12 4 | 12 4 |
| −0 20 | 12 7 | 12 6 | 12 6 | 12 6 | 12 6 | 12 6 | 12 6 | 12 6 | 12 7 |
| 0 0 | 12 7 | 12 7 | 12 7 | 12 7 | 12 7 | 12 7 | 12 8 | 12 8 | 12 9 |
| +0 20 | 12 7 | 12 7 | 12 7 | 12 8 | 12 8 | 12 8 | 12 9 | 12 10 | 12 11 |
| 0 40 | 12 7 | 12 7 | 12 8 | 12 8 | 12 9 | 12 10 | 12 11 | 12 12 | 12 13 |
| 1 0 | 12 7 | 12 7 | 12 8 | 12 9 | 12 10 | 12 11 | 12 13 | 12 14 | 12 15 |
| 1 20 | 12 7 | 12 8 | 12 9 | 12 10 | 12 11 | 12 13 | 12 14 | 12 16 | 12 17 |
| 1 40 | 12 7 | 12 8 | 12 9 | 12 10 | 12 12 | 12 14 | 12 16 | 12 17 | 12 20 |
| 2 0 | 12 7 | 12 8 | 12 10 | 12 11 | 12 13 | 12 15 | 12 17 | 12 19 | 12 22 |
| 2 20 | 12 7 | 12 8 | 12 10 | 12 12 | 12 14 | 12 16 | 12 19 | 12 21 | 12 25 |
| 2 40 | 12 7 | 12 9 | 12 11 | 12 13 | 12 15 | 12 17 | 12 20 | 12 23 | 12 27 |
| 3 0 | 12 7 | 12 9 | 12 11 | 12 13 | 12 16 | 12 19 | 12 22 | 12 25 | 12 29 |
| 3 20 | 12 7 | 12 9 | 12 12 | 12 14 | 12 17 | 12 20 | 12 23 | 12 27 | 12 31 |
| 3 40 | 12 7 | 12 9 | 12 12 | 12 15 | 12 18 | 12 21 | 12 25 | 12 29 | 12 33 |
| 4 0 | 12 7 | 12 10 | 12 13 | 12 16 | 12 19 | 12 22 | 12 26 | 12 31 | 12 35 |
| 4 20 | 12 7 | 12 10 | 12 13 | 12 16 | 12 20 | 12 23 | 12 28 | 12 32 | 12 38 |
| 4 40 | 12 7 | 12 10 | 12 14 | 12 17 | 12 21 | 12 25 | 12 29 | 12 34 | 12 40 |
| 5 0 | 12 7 | 12 10 | 12 14 | 12 18 | 12 22 | 12 26 | 12 31 | 12 36 | 12 43 |
| 5 20 | 12 7 | 12 10 | 12 15 | 12 19 | 12 23 | 12 28 | 12 32 | 12 38 | 12 45 |
| 5 40 | 12 7 | 12 11 | 12 15 | 12 19 | 12 24 | 12 29 | 12 34 | 12 40 | 12 47 |
| 6 0 | 12 7 | 12 11 | 12 16 | 12 20 | 12 25 | 12 30 | 12 35 | 12 42 | 12 49 |
| 6 20 | 12 7 | 12 11 | 12 16 | 12 21 | 12 26 | 12 31 | 12 37 | 12 44 | 12 52 |
| 6 40 | 12 7 | 12 11 | 12 16 | 12 22 | 12 27 | 12 32 | 12 39 | 12 46 | 12 54 |
| 7 0 | 12 7 | 12 12 | 12 17 | 12 22 | 12 28 | 12 34 | 12 40 | 12 48 | 12 56 |
| 7 20 | 12 7 | 12 12 | 12 17 | 12 23 | 12 29 | 12 35 | 12 42 | 12 50 | 12 58 |
| 7 40 | 12 7 | 12 12 | 12 18 | 12 23 | 12 30 | 12 36 | 12 43 | 12 52 | 13 1 |
| 8 0 | 12 7 | 12 13 | 12 18 | 12 24 | 12 31 | 12 38 | 12 45 | 12 53 | 13 3 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 42° | 44° | 46° | 48° | 50° | 52° | 54° | 56° | 58° | 60° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −8° 0′ | 11 11 | 11 7 | 11 3 | 11 58 | 10 53 | 10 48 | 10 43 | 10 36 | 10 30 | 10 21 |
| −7 40 | 11 13 | 11 10 | 11 5 | 11 1 | 10 57 | 10 52 | 10 46 | 10 40 | 10 34 | 10 26 |
| −7 20 | 11 16 | 11 12 | 11 8 | 11 4 | 11 0 | 10 55 | 10 50 | 10 44 | 10 38 | 10 31 |
| −7 0 | 11 19 | 11 15 | 11 11 | 11 7 | 11 3 | 10 59 | 10 54 | 10 48 | 10 42 | 10 35 |
| −6 40 | 11 21 | 11 17 | 11 14 | 11 10 | 11 7 | 11 2 | 10 58 | 10 52 | 10 47 | 10 40 |
| −6 20 | 11 23 | 11 20 | 11 17 | 11 13 | 11 10 | 11 5 | 11 1 | 10 56 | 10 51 | 10 45 |
| −6 0 | 11 26 | 11 23 | 11 20 | 11 16 | 11 13 | 11 9 | 11 5 | 11 0 | 10 55 | 10 50 |
| −5 40 | 11 28 | 11 25 | 11 23 | 11 19 | 11 16 | 11 13 | 11 8 | 11 4 | 10 59 | 10 55 |
| −5 20 | 11 31 | 11 28 | 11 25 | 11 22 | 11 19 | 11 16 | 11 13 | 11 8 | 11 4 | 10 59 |
| −5 0 | 11 33 | 11 31 | 11 28 | 11 25 | 11 23 | 11 19 | 11 16 | 11 12 | 11 8 | 11 4 |
| −4 40 | 11 35 | 11 33 | 11 31 | 11 28 | 11 26 | 11 23 | 11 20 | 11 16 | 11 13 | 11 8 |
| −4 20 | 11 38 | 11 36 | 11 34 | 11 31 | 11 29 | 11 26 | 11 23 | 11 20 | 11 17 | 11 13 |
| −4 0 | 11 40 | 11 38 | 11 37 | 11 34 | 11 32 | 11 30 | 11 27 | 11 24 | 11 21 | 11 18 |
| −3 40 | 11 43 | 11 41 | 11 39 | 11 37 | 11 35 | 11 33 | 11 31 | 11 28 | 11 26 | 11 22 |
| −3 20 | 11 45 | 11 43 | 11 42 | 11 40 | 11 38 | 11 37 | 11 35 | 11 32 | 11 30 | 11 27 |
| −3 0 | 11 47 | 11 46 | 11 45 | 11 43 | 11 42 | 11 40 | 11 38 | 11 36 | 11 34 | 11 32 |
| −2 40 | 11 50 | 11 49 | 11 47 | 11 46 | 11 45 | 11 44 | 11 42 | 11 40 | 11 38 | 11 37 |
| −2 20 | 11 52 | 11 51 | 11 50 | 11 49 | 11 48 | 11 47 | 11 46 | 11 44 | 11 43 | 11 41 |
| −2 0 | 11 55 | 11 54 | 11 53 | 11 52 | 11 52 | 11 50 | 11 49 | 11 48 | 11 47 | 11 46 |
| −1 40 | 11 57 | 11 56 | 11 55 | 11 55 | 11 55 | 11 54 | 11 53 | 11 52 | 11 51 | 11 50 |
| −1 20 | 11 59 | 11 59 | 11 58 | 11 58 | 11 58 | 11 57 | 11 57 | 11 56 | 11 56 | 11 55 |
| −1 0 | 12 2 | 12 2 | 12 1 | 12 1 | 12 1 | 12 1 | 12 1 | 12 0 | 12 0 | 11 59 |
| −0 40 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 |
| −0 20 | 12 7 | 12 7 | 12 7 | 12 7 | 12 7 | 12 7 | 12 8 | 12 8 | 12 8 | 12 9 |
| +0 0 | 12 9 | 12 9 | 12 10 | 12 10 | 12 10 | 12 11 | 12 11 | 12 12 | 12 13 | 12 13 |
| 0 20 | 12 11 | 12 12 | 12 13 | 12 13 | 12 14 | 12 14 | 12 15 | 12 16 | 12 17 | 12 18 |
| 0 40 | 12 14 | 12 14 | 12 15 | 12 16 | 12 17 | 12 17 | 12 19 | 12 20 | 12 21 | 12 23 |
| 1 0 | 12 16 | 12 17 | 12 18 | 12 19 | 12 20 | 12 21 | 12 22 | 12 24 | 12 25 | 12 27 |
| 1 20 | 12 19 | 12 20 | 12 20 | 12 22 | 12 23 | 12 25 | 12 26 | 12 28 | 12 29 | 12 32 |
| 1 40 | 12 21 | 12 22 | 12 23 | 12 25 | 12 26 | 12 28 | 12 30 | 12 32 | 12 34 | 12 37 |
| 2 0 | 12 23 | 12 25 | 12 26 | 12 28 | 12 29 | 12 31 | 12 34 | 12 36 | 12 38 | 12 41 |
| 2 20 | 12 26 | 12 28 | 12 29 | 12 31 | 12 32 | 12 35 | 12 37 | 12 40 | 12 43 | 12 46 |
| 2 40 | 12 28 | 12 30 | 12 32 | 12 34 | 12 36 | 12 38 | 12 41 | 12 44 | 12 47 | 12 50 |
| 3 0 | 12 31 | 12 32 | 12 35 | 12 37 | 12 39 | 12 41 | 12 44 | 12 48 | 12 51 | 12 55 |
| 3 20 | 12 33 | 12 35 | 12 37 | 12 40 | 12 42 | 12 45 | 12 48 | 12 52 | 12 55 | 13 0 |
| 3 40 | 12 35 | 12 38 | 12 40 | 12 43 | 12 46 | 12 49 | 12 52 | 12 56 | 13 0 | 13 4 |
| 4 0 | 12 38 | 12 40 | 12 43 | 12 46 | 12 49 | 12 52 | 12 56 | 13 0 | 13 4 | 13 9 |
| 4 20 | 12 40 | 12 43 | 12 46 | 12 49 | 12 52 | 12 55 | 12 59 | 13 4 | 13 8 | 13 14 |
| 4 40 | 12 43 | 12 46 | 12 49 | 12 52 | 12 55 | 12 59 | 13 3 | 13 8 | 13 13 | 13 19 |
| 5 0 | 12 45 | 12 48 | 12 51 | 12 55 | 12 58 | 13 2 | 13 7 | 13 12 | 13 17 | 13 23 |
| 5 20 | 12 47 | 12 51 | 12 54 | 12 58 | 13 2 | 13 6 | 13 11 | 13 16 | 13 22 | 13 28 |
| 5 40 | 12 50 | 12 53 | 12 57 | 13 1 | 13 5 | 13 10 | 13 14 | 13 20 | 13 26 | 13 33 |
| 6 0 | 12 53 | 12 56 | 12 59 | 13 4 | 13 8 | 13 13 | 13 18 | 13 24 | 13 31 | 13 38 |
| 6 20 | 12 55 | 12 59 | 13 2 | 13 7 | 13 11 | 13 16 | 13 22 | 13 28 | 13 35 | 13 43 |
| 6 40 | 12 58 | 13 1 | 13 5 | 13 10 | 13 14 | 13 20 | 13 26 | 13 32 | 13 39 | 13 47 |
| 7 0 | 13 0 | 13 4 | 13 8 | 13 13 | 13 18 | 13 23 | 13 29 | 13 36 | 13 44 | 13 52 |
| 7 20 | 13 2 | 13 7 | 13 11 | 13 16 | 13 21 | 13 27 | 13 33 | 13 40 | 13 48 | 13 57 |
| 7 40 | 13 5 | 13 9 | 13 14 | 13 19 | 13 25 | 13 31 | 13 37 | 13 44 | 13 53 | 14 2 |
| 8 0 | 13 7 | 13 12 | 13 17 | 13 22 | 13 28 | 13 34 | 13 41 | 13 48 | 13 57 | 14 7 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| +8° 0′ | 12 7 | 12 13 | 12 18 | 12 24 | 12 31 | 12 38 | 12 45 | 12 53 | 13 3 |
| 8 20 | 12 7 | 12 13 | 12 19 | 12 25 | 12 32 | 12 39 | 12 47 | 12 55 | 13 5 |
| 8 40 | 12 7 | 12 13 | 12 19 | 12 26 | 12 33 | 12 40 | 12 48 | 12 57 | 13 8 |
| 9 0 | 12 7 | 12 13 | 12 20 | 12 26 | 12 34 | 12 41 | 12 50 | 12 59 | 13 10 |
| 9 20 | 12 7 | 12 13 | 12 20 | 12 27 | 12 35 | 12 43 | 12 52 | 13 1 | 13 13 |
| 9 40 | 12 7 | 12 14 | 12 21 | 12 28 | 12 36 | 12 44 | 12 53 | 13 3 | 13 14 |
| 10 0 | 12 7 | 12 14 | 12 21 | 12 29 | 12 37 | 12 45 | 12 55 | 13 5 | 13 17 |
| 10 20 | 12 7 | 12 14 | 12 22 | 12 29 | 12 38 | 12 47 | 12 56 | 13 7 | 13 19 |
| 10 40 | 12 7 | 12 14 | 12 22 | 12 30 | 12 39 | 12 48 | 12 58 | 13 9 | 13 22 |
| 11 0 | 12 7 | 12 15 | 12 23 | 12 31 | 12 40 | 12 49 | 12 59 | 13 11 | 13 24 |
| 11 20 | 12 7 | 12 15 | 12 23 | 12 32 | 12 41 | 12 50 | 13 1 | 13 13 | 13 26 |
| 11 40 | 12 7 | 12 15 | 12 24 | 12 32 | 12 42 | 12 52 | 13 2 | 13 15 | 13 29 |
| 12 0 | 12 7 | 12 15 | 12 24 | 12 33 | 12 43 | 12 53 | 13 4 | 13 17 | 13 31 |
| 12 20 | 12 7 | 12 16 | 12 25 | 12 34 | 12 44 | 12 55 | 13 6 | 13 19 | 13 34 |
| 12 40 | 12 7 | 12 16 | 12 25 | 12 35 | 12 45 | 12 56 | 13 8 | 13 21 | 13 36 |
| 13 0 | 12 7 | 12 16 | 12 26 | 12 35 | 12 46 | 12 57 | 13 9 | 13 23 | 13 38 |
| 13 20 | 12 7 | 12 16 | 12 26 | 12 36 | 12 47 | 12 58 | 13 11 | 13 25 | 13 41 |
| 13 40 | 12 7 | 12 17 | 12 27 | 12 37 | 12 48 | 13 0 | 13 13 | 13 27 | 13 43 |
| 14 0 | 12 7 | 12 17 | 12 27 | 12 38 | 12 49 | 13 1 | 13 14 | 13 29 | 13 46 |
| 14 20 | 12 7 | 12 17 | 12 28 | 12 39 | 12 50 | 13 2 | 13 16 | 13 31 | 13 48 |
| 14 40 | 12 7 | 12 17 | 12 28 | 12 40 | 12 51 | 13 4 | 13 17 | 13 33 | 13 51 |
| 15 0 | 12 7 | 12 18 | 12 29 | 12 40 | 12 52 | 13 5 | 13 19 | 13 35 | 13 53 |
| 15 20 | 12 7 | 12 18 | 12 29 | 12 41 | 12 53 | 13 7 | 13 21 | 13 37 | 13 56 |
| 15 40 | 12 7 | 12 18 | 12 30 | 12 41 | 12 54 | 13 8 | 13 23 | 13 39 | 13 58 |
| 16 0 | 12 7 | 12 19 | 12 30 | 12 42 | 12 55 | 13 9 | 13 25 | 13 41 | 14 1 |
| 16 20 | 12 7 | 12 19 | 12 31 | 12 43 | 12 56 | 13 11 | 13 26 | 13 43 | 14 3 |
| 16 40 | 12 7 | 12 19 | 12 31 | 12 44 | 12 58 | 13 12 | 13 28 | 13 45 | 14 6 |
| 17 0 | 12 7 | 12 19 | 12 32 | 12 45 | 12 59 | 13 13 | 13 29 | 13 47 | 14 8 |
| 17 20 | 12 7 | 12 20 | 12 32 | 12 46 | 13 0 | 13 15 | 13 31 | 13 50 | 14 11 |
| 17 40 | 12 7 | 12 20 | 12 33 | 12 46 | 13 1 | 13 16 | 13 33 | 13 52 | 14 14 |
| 18 0 | 12 7 | 12 20 | 12 33 | 12 47 | 13 2 | 13 17 | 13 35 | 13 54 | 14 16 |
| 18 20 | 12 7 | 12 20 | 12 34 | 12 48 | 13 3 | 13 19 | 13 37 | 13 56 | 14 19 |
| 18 40 | 12 7 | 12 21 | 12 34 | 12 49 | 13 4 | 13 20 | 13 38 | 13 58 | 14 22 |
| 19 0 | 12 7 | 12 21 | 12 35 | 12 50 | 13 5 | 13 22 | 13 40 | 14 0 | 14 24 |
| 19 20 | 12 7 | 12 21 | 12 35 | 12 51 | 13 6 | 13 23 | 13 42 | 14 2 | 14 26 |
| 19 40 | 12 7 | 12 22 | 12 36 | 12 52 | 13 7 | 13 25 | 13 44 | 14 5 | 14 29 |
| 20 0 | 12 7 | 12 22 | 12 36 | 12 52 | 13 8 | 13 26 | 13 46 | 14 7 | 14 32 |
| 20 20 | 12 7 | 12 22 | 12 37 | 12 53 | 13 10 | 13 28 | 13 47 | 14 10 | 14 35 |
| 20 40 | 12 7 | 12 22 | 12 37 | 12 54 | 13 11 | 13 29 | 13 49 | 14 12 | 14 37 |
| 21 0 | 12 7 | 12 23 | 12 38 | 12 55 | 13 12 | 13 31 | 13 51 | 14 14 | 14 40 |
| 21 20 | 12 7 | 12 23 | 12 39 | 12 56 | 13 13 | 13 32 | 13 53 | 14 16 | 14 43 |
| 21 40 | 12 7 | 12 23 | 12 39 | 12 56 | 13 14 | 13 34 | 13 55 | 14 19 | 14 46 |
| 22 0 | 12 7 | 12 24 | 12 40 | 12 57 | 13 16 | 13 35 | 13 56 | 14 21 | 14 49 |
| 22 20 | 12 7 | 12 24 | 12 41 | 12 58 | 13 17 | 13 37 | 13 58 | 14 23 | 14 52 |
| 22 40 | 12 7 | 12 24 | 12 41 | 12 59 | 13 18 | 13 38 | 14 0 | 14 25 | 14 54 |
| 23 0 | 12 7 | 12 25 | 12 42 | 13 0 | 13 19 | 13 40 | 14 2 | 14 28 | 14 57 |
| 23 20 | 12 7 | 12 25 | 12 42 | 13 1 | 13 20 | 13 41 | 14 4 | 14 30 | 15 0 |
| 23 27 | 12 7 | 12 25 | 12 43 | 13 1 | 13 20 | 13 41 | 14 5 | 14 31 | 15 1 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 42° | 44° | 46° | 48° | 50° | 52° | 54° | 56° | 58° | 60° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| +8° 0′ | 13 7 | 13 12 | 13 17 | 13 22 | 13 28 | 13 34 | 13 41 | 13 49 | 13 58 | 14 7 |
| 8 20 | 13 10 | 13 14 | 13 20 | 13 25 | 13 31 | 13 38 | 13 45 | 13 53 | 14 2 | 14 12 |
| 8 40 | 13 12 | 13 17 | 13 23 | 13 28 | 13 34 | 13 41 | 13 49 | 13 57 | 14 6 | 14 17 |
| 9 0 | 13 15 | 13 20 | 13 25 | 13 31 | 13 38 | 13 45 | 13 53 | 14 1 | 14 11 | 14 22 |
| 9 20 | 13 17 | 13 23 | 13 28 | 13 34 | 13 41 | 13 49 | 13 56 | 14 5 | 14 15 | 14 26 |
| 9 40 | 13 20 | 13 25 | 13 31 | 13 38 | 13 44 | 13 52 | 14 0 | 14 10 | 14 20 | 14 31 |
| 10 0 | 13 22 | 13 28 | 13 34 | 13 41 | 13 48 | 13 56 | 14 4 | 14 14 | 14 25 | 14 36 |
| 10 20 | 13 25 | 13 31 | 13 37 | 13 44 | 13 51 | 13 59 | 14 8 | 14 18 | 14 29 | 14 41 |
| 10 40 | 13 28 | 13 34 | 13 40 | 13 47 | 13 55 | 14 3 | 14 12 | 14 22 | 14 34 | 14 47 |
| 11 0 | 13 30 | 13 36 | 13 43 | 13 50 | 13 58 | 14 7 | 14 16 | 14 27 | 14 38 | 14 52 |
| 11 20 | 13 32 | 13 39 | 13 46 | 13 53 | 14 1 | 14 10 | 14 20 | 14 31 | 14 43 | 14 57 |
| 11 40 | 13 35 | 13 41 | 13 49 | 13 56 | 14 5 | 14 14 | 14 24 | 14 35 | 14 48 | 15 2 |
| 12 0 | 13 38 | 13 44 | 13 52 | 14 0 | 14 8 | 14 18 | 14 28 | 14 40 | 14 53 | 15 8 |
| 12 20 | 13 40 | 13 47 | 13 55 | 14 3 | 14 12 | 14 22 | 14 32 | 14 44 | 14 58 | 15 13 |
| 12 40 | 13 43 | 13 50 | 13 58 | 14 6 | 14 16 | 14 25 | 14 37 | 14 49 | 15 2 | 15 18 |
| 13 0 | 13 46 | 13 53 | 14 1 | 14 10 | 14 19 | 14 29 | 14 41 | 14 53 | 15 7 | 15 23 |
| 13 20 | 13 48 | 13 56 | 14 4 | 14 13 | 14 22 | 14 33 | 14 45 | 14 58 | 15 13 | 15 29 |
| 13 40 | 13 50 | 13 58 | 14 7 | 14 16 | 14 26 | 14 37 | 14 49 | 15 2 | 15 17 | 15 35 |
| 14 0 | 13 53 | 14 1 | 14 10 | 14 19 | 14 29 | 14 41 | 14 53 | 15 7 | 15 22 | 15 40 |
| 14 20 | 13 56 | 14 4 | 14 13 | 14 23 | 14 33 | 14 45 | 14 57 | 15 11 | 15 28 | 15 46 |
| 14 40 | 13 59 | 14 7 | 14 16 | 14 26 | 14 37 | 14 49 | 15 2 | 15 16 | 15 33 | 15 51 |
| 15 0 | 14 1 | 14 10 | 14 19 | 14 29 | 14 40 | 14 52 | 15 6 | 15 21 | 15 38 | 15 57 |
| 15 20 | 14 4 | 14 13 | 14 22 | 14 33 | 14 44 | 14 56 | 15 10 | 15 26 | 15 43 | 16 2 |
| 15 40 | 14 7 | 14 16 | 14 26 | 14 36 | 14 48 | 15 0 | 15 14 | 15 30 | 15 48 | 16 8 |
| 16 0 | 14 10 | 14 19 | 14 29 | 14 40 | 14 52 | 15 4 | 15 19 | 15 35 | 15 53 | 16 14 |
| 16 20 | 14 12 | 14 22 | 14 32 | 14 43 | 14 55 | 15 8 | 15 23 | 15 40 | 15 59 | 16 20 |
| 16 40 | 14 15 | 14 25 | 14 35 | 14 46 | 14 59 | 15 13 | 15 28 | 15 45 | 16 4 | 16 26 |
| 17 0 | 14 17 | 14 28 | 14 38 | 14 50 | 15 3 | 15 17 | 15 32 | 15 50 | 16 10 | 16 32 |
| 17 20 | 14 20 | 14 31 | 14 41 | 14 53 | 15 7 | 15 21 | 15 37 | 15 55 | 16 15 | 16 38 |
| 17 40 | 14 23 | 14 34 | 14 45 | 14 57 | 15 10 | 15 25 | 15 41 | 16 0 | 16 20 | 16 45 |
| 18 0 | 14 26 | 14 37 | 14 48 | 15 1 | 15 14 | 15 29 | 15 46 | 16 5 | 16 26 | 16 51 |
| 18 20 | 14 29 | 14 40 | 14 52 | 15 4 | 15 18 | 15 34 | 15 50 | 16 10 | 16 32 | 16 58 |
| 18 40 | 14 32 | 14 43 | 14 55 | 15 8 | 15 22 | 15 38 | 15 55 | 16 15 | 16 38 | 17 4 |
| 19 0 | 14 35 | 14 46 | 14 58 | 15 11 | 15 26 | 15 42 | 16 0 | 16 20 | 16 44 | 17 11 |
| 19 20 | 14 37 | 14 49 | 15 1 | 15 15 | 15 30 | 15 46 | 16 5 | 16 25 | 16 50 | 17 17 |
| 19 40 | 14 40 | 14 52 | 15 5 | 15 19 | 15 34 | 15 51 | 16 10 | 16 31 | 16 56 | 17 24 |
| 20 0 | 14 43 | 14 55 | 15 8 | 15 22 | 15 38 | 15 55 | 16 15 | 16 37 | 17 2 | 17 31 |
| 20 20 | 14 46 | 14 58 | 15 11 | 15 26 | 15 42 | 16 0 | 16 20 | 16 42 | 17 8 | 17 38 |
| 20 40 | 14 49 | 15 2 | 15 15 | 15 30 | 15 46 | 16 4 | 16 25 | 16 47 | 17 14 | 17 46 |
| 21 0 | 14 52 | 15 5 | 15 19 | 15 34 | 15 50 | 16 9 | 16 30 | 16 53 | 17 20 | 17 53 |
| 21 20 | 14 55 | 15 8 | 15 22 | 15 38 | 15 55 | 16 13 | 16 35 | 16 59 | 17 27 | 18 1 |
| 21 40 | 14 58 | 15 11 | 15 26 | 15 42 | 15 59 | 16 18 | 16 40 | 17 5 | 17 34 | 18 8 |
| 22 0 | 15 1 | 15 14 | 15 29 | 15 46 | 16 3 | 16 23 | 16 45 | 17 11 | 17 40 | 18 16 |
| 22 20 | 15 4 | 15 18 | 15 33 | 15 49 | 16 7 | 16 28 | 16 50 | 17 17 | 17 47 | 18 24 |
| 22 40 | 15 7 | 15 22 | 15 37 | 15 53 | 16 12 | 16 32 | 16 56 | 17 23 | 17 54 | 18 32 |
| 23 0 | 15 10 | 15 25 | 15 40 | 15 57 | 16 16 | 16 37 | 17 1 | 17 29 | 18 1 | 18 41 |
| 23 20 | 15 13 | 15 28 | 15 44 | 16 1 | 16 21 | 16 42 | 17 7 | 17 35 | 18 8 | 18 49 |
| 23 27 | 15 14 | 15 29 | 15 46 | 16 3 | 16 23 | 16 44 | 17 9 | 17 37 | 18 11 | 18 52 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 60° | 61° | 62° | 63° | 64° | 65° | 66° | 67° | 68° | 69° | 70° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −23° 27′ | 5 52 | 5 31 | 5 8 | 4 42 | 4 11 | 3 34 | 2 46 | 1 29 | | | |
| −23 20 | 5 55 | 5 34 | 5 12 | 4 46 | 4 16 | 3 40 | 2 53 | 1 41 | | | |
| −23 0 | 6 2 | 5 43 | 5 21 | 4 56 | 4 28 | 3 53 | 3 11 | 2 11 | | | |
| −22 40 | 6 10 | 5 51 | 5 30 | 5 6 | 4 39 | 4 7 | 3 27 | 2 35 | 0 59 | | |
| −22 20 | 6 17 | 5 59 | 5 39 | 5 16 | 4 50 | 4 20 | 3 43 | 2 56 | 1 43 | | |
| −22 0 | 6 25 | 6 7 | 5 47 | 5 25 | 5 1 | 4 32 | 3 58 | 3 14 | 2 13 | | |
| −21 40 | 6 32 | 6 14 | 5 56 | 5 34 | 5 11 | 4 43 | 4 11 | 3 31 | 2 38 | 1 1 | |
| −21 20 | 6 39 | 6 22 | 6 4 | 5 43 | 5 20 | 4 55 | 4 24 | 3 47 | 2 59 | 1 45 | |
| −21 0 | 6 46 | 6 29 | 6 12 | 5 52 | 5 30 | 5 5 | 4 36 | 4 1 | 3 18 | 2 16 | |
| −20 40 | 6 52 | 6 37 | 6 20 | 6 1 | 5 40 | 5 16 | 4 48 | 4 16 | 3 35 | 2 41 | 1 2 |
| −20 20 | 6 59 | 6 44 | 6 27 | 6 9 | 5 49 | 5 26 | 4 59 | 4 29 | 3 51 | 3 2 | 1 47 |
| −20 0 | 7 5 | 6 51 | 6 34 | 6 17 | 5 58 | 5 35 | 5 10 | 4 41 | 4 6 | 3 22 | 2 19 |
| −19 40 | 7 12 | 6 58 | 6 42 | 6 25 | 6 6 | 5 45 | 5 21 | 4 53 | 4 20 | 3 39 | 2 44 |
| −19 20 | 7 18 | 7 4 | 6 49 | 6 33 | 6 14 | 5 54 | 5 31 | 5 5 | 4 34 | 3 55 | 3 6 |
| −19 0 | 7 25 | 7 11 | 6 56 | 6 41 | 6 23 | 6 3 | 5 41 | 5 16 | 4 47 | 4 11 | 3 26 |
| −18 40 | 7 31 | 7 17 | 7 4 | 6 48 | 6 31 | 6 12 | 5 51 | 5 26 | 4 59 | 4 25 | 3 44 |
| −18 20 | 7 37 | 7 24 | 7 10 | 6 55 | 6 39 | 6 20 | 6 1 | 5 37 | 5 11 | 4 39 | 4 1 |
| −18 0 | 7 43 | 7 31 | 7 17 | 7 3 | 6 47 | 6 29 | 6 10 | 5 47 | 5 22 | 4 52 | 4 16 |
| −17 40 | 7 49 | 7 37 | 7 24 | 7 10 | 6 55 | 6 38 | 6 19 | 5 57 | 5 33 | 5 5 | 4 31 |
| −17 20 | 7 55 | 7 43 | 7 31 | 7 17 | 7 2 | 6 46 | 6 28 | 6 7 | 5 43 | 5 17 | 4 45 |
| −17 0 | 8 1 | 7 49 | 7 37 | 7 24 | 7 9 | 6 53 | 6 36 | 6 16 | 5 54 | 5 28 | 4 58 |
| −16 40 | 8 6 | 7 55 | 7 44 | 7 31 | 7 17 | 7 1 | 6 44 | 6 26 | 6 4 | 5 40 | 5 11 |
| −16 20 | 8 12 | 8 1 | 7 50 | 7 38 | 7 24 | 7 9 | 6 52 | 6 35 | 6 14 | 5 51 | 5 23 |
| −16 0 | 8 17 | 8 7 | 7 56 | 7 44 | 7 31 | 7 17 | 7 1 | 6 44 | 6 24 | 6 2 | 5 35 |
| −15 40 | 8 23 | 8 13 | 8 2 | 7 51 | 7 38 | 7 25 | 7 9 | 6 52 | 6 34 | 6 12 | 5 47 |
| −15 20 | 8 29 | 8 19 | 8 8 | 7 58 | 7 45 | 7 32 | 7 17 | 7 1 | 6 43 | 6 22 | 5 59 |
| −15 0 | 8 34 | 8 25 | 8 15 | 8 4 | 7 52 | 7 39 | 7 25 | 7 9 | 6 52 | 6 32 | 6 10 |
| −14 40 | 8 40 | 8 31 | 8 21 | 8 10 | 7 59 | 7 46 | 7 32 | 7 17 | 7 1 | 6 42 | 6 20 |
| −14 20 | 8 45 | 8 36 | 8 27 | 8 17 | 8 5 | 7 53 | 7 40 | 7 26 | 7 10 | 6 51 | 6 31 |
| −14 0 | 8 50 | 8 42 | 8 33 | 8 23 | 8 12 | 8 1 | 7 47 | 7 34 | 7 18 | 7 1 | 6 41 |
| −13 40 | 8 56 | 8 47 | 8 38 | 8 29 | 8 19 | 8 7 | 7 55 | 7 41 | 7 26 | 7 10 | 6 51 |
| −13 20 | 9 1 | 8 53 | 8 44 | 8 35 | 8 25 | 8 14 | 8 2 | 7 49 | 7 35 | 7 19 | 7 1 |
| −13 0 | 9 6 | 8 58 | 8 50 | 8 41 | 8 32 | 8 21 | 8 10 | 7 57 | 7 43 | 7 28 | 7 10 |
| −12 40 | 9 11 | 9 4 | 8 56 | 8 47 | 8 38 | 8 28 | 8 17 | 8 5 | 7 51 | 7 37 | 7 20 |
| −12 20 | 9 17 | 9 10 | 9 2 | 8 53 | 8 44 | 8 34 | 8 24 | 8 12 | 7 59 | 7 45 | 7 29 |
| −12 0 | 9 22 | 9 15 | 9 7 | 8 59 | 8 50 | 8 41 | 8 31 | 8 20 | 8 7 | 7 53 | 7 38 |
| −11 40 | 9 27 | 9 20 | 9 13 | 9 5 | 8 56 | 8 47 | 8 38 | 8 27 | 8 15 | 8 2 | 7 47 |
| −11 20 | 9 32 | 9 25 | 9 19 | 9 11 | 9 3 | 8 54 | 8 44 | 8 34 | 8 23 | 8 10 | 7 56 |
| −11 0 | 9 37 | 9 31 | 9 24 | 9 17 | 9 9 | 9 0 | 8 51 | 8 41 | 8 31 | 8 18 | 8 5 |
| −10 40 | 9 42 | 9 36 | 9 29 | 9 22 | 9 15 | 9 7 | 8 58 | 8 49 | 8 38 | 8 26 | 8 14 |
| −10 20 | 9 47 | 9 41 | 9 35 | 9 28 | 9 21 | 9 13 | 9 5 | 8 56 | 8 46 | 8 34 | 8 22 |
| −10 0 | 9 52 | 9 46 | 9 40 | 9 34 | 9 27 | 9 19 | 9 11 | 9 3 | 8 53 | 8 42 | 8 31 |
| −9 40 | 9 57 | 9 51 | 9 46 | 9 40 | 9 33 | 9 26 | 9 18 | 9 10 | 9 0 | 8 50 | 8 39 |
| −9 20 | 10 2 | 9 56 | 9 51 | 9 45 | 9 39 | 9 32 | 9 25 | 9 16 | 9 8 | 8 58 | 8 47 |
| −9 0 | 10 7 | 10 2 | 9 56 | 9 50 | 9 44 | 9 38 | 9 31 | 9 23 | 9 15 | 9 5 | 8 55 |
| −8 40 | 10 11 | 10 7 | 10 2 | 9 56 | 9 50 | 9 44 | 9 37 | 9 30 | 9 22 | 9 13 | 9 3 |
| −8 20 | 10 16 | 10 12 | 10 7 | 10 2 | 9 56 | 9 50 | 9 44 | 9 37 | 9 29 | 9 21 | 9 11 |
| −8 0 | 10 21 | 10 17 | 10 12 | 10 7 | 10 2 | 9 56 | 9 50 | 9 43 | 9 36 | 9 28 | 9 19 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 71° | 72° | 73° | 74° | 75° | 76° | 77° | 78° | 79° | 80° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −23° 27′ | | | | | | | | | | |
| −23 20 | | | | | | | | | | |
| −23 0 | | | | | | | | | | |
| −22 40 | | | | | | | | | | |
| −22 20 | | | | | | | | | | |
| −22 0 | | | | | | | | | | |
| −21 40 | | | | | | | | | | |
| −21 20 | | | | | | | | | | |
| −21 0 | | | | | | | | | | |
| −20 40 | | | | | | | | | | |
| −20 20 | | | | | | | | | | |
| −20 0 | | | | | | | | | | |
| −19 40 | 1 3 | | | | | | | | | |
| −19 20 | 1 50 | | | | | | | | | |
| −19 0 | 2 22 | | | | | | | | | |
| −18 40 | 2 47 | 1 5 | | | | | | | | |
| −18 20 | 3 10 | 1 52 | | | | | | | | |
| −18 0 | 3 30 | 2 25 | | | | | | | | |
| −17 40 | 3 49 | 2 52 | 1 6 | | | | | | | |
| −17 20 | 4 6 | 3 14 | 1 55 | | | | | | | |
| −17 0 | 4 22 | 3 35 | 2 29 | | | | | | | |
| −16 40 | 4 37 | 3 54 | 2 56 | 1 8 | | | | | | |
| −16 20 | 4 52 | 4 12 | 3 20 | 1 58 | | | | | | |
| −16 0 | 5 6 | 4 28 | 3 41 | 2 32 | | | | | | |
| −15 40 | 5 19 | 4 44 | 4 1 | 3 1 | 1 10 | | | | | |
| −15 20 | 5 32 | 4 59 | 4 19 | 3 25 | 2 2 | | | | | |
| −15 0 | 5 44 | 5 13 | 4 36 | 3 47 | 2 37 | | | | | |
| −14 40 | 5 56 | 5 27 | 4 52 | 4 7 | 3 6 | 1 13 | | | | |
| −14 20 | 6 8 | 5 40 | 5 7 | 4 26 | 3 31 | 2 5 | | | | |
| −14 0 | 6 19 | 5 52 | 5 21 | 4 43 | 3 54 | 2 42 | | | | |
| −13 40 | 6 29 | 6 5 | 5 35 | 5 0 | 4 14 | 3 12 | 1 15 | | | |
| −13 20 | 6 40 | 6 17 | 5 49 | 5 16 | 4 34 | 3 38 | 2 10 | | | |
| −13 0 | 6 51 | 6 29 | 6 2 | 5 31 | 4 52 | 4 2 | 2 48 | | | |
| −12 40 | 6 1 | 6 40 | 6 15 | 5 45 | 5 9 | 4 23 | 3 19 | 1 18 | | |
| −12 20 | 7 11 | 6 50 | 6 27 | 5 59 | 5 25 | 4 43 | 3 46 | 2 15 | | |
| −12 0 | 7 21 | 7 1 | 6 39 | 6 13 | 5 41 | 5 2 | 4 10 | 2 55 | | |
| −11 40 | 7 31 | 7 12 | 6 51 | 6 26 | 5 56 | 5 19 | 4 32 | 3 27 | 1 21 | |
| −11 20 | 7 40 | 7 23 | 7 3 | 6 38 | 6 11 | 5 38 | 4 53 | 3 55 | 2 20 | |
| −11 0 | 7 50 | 7 33 | 7 14 | 6 51 | 6 25 | 5 54 | 5 13 | 4 20 | 3 2 | |
| −10 40 | 7 59 | 7 43 | 7 25 | 7 3 | 6 34 | 6 9 | 5 31 | 4 43 | 3 35 | 1 25 |
| −10 20 | 8 8 | 7 53 | 7 35 | 7 15 | 6 52 | 6 23 | 5 49 | 5 5 | 4 5 | 2 27 |
| −10 0 | 8 17 | 8 3 | 7 46 | 7 27 | 7 4 | 6 38 | 6 6 | 5 25 | 4 31 | 3 10 |
| − 9 40 | 8 26 | 8 13 | 7 56 | 7 38 | 7 17 | 6 52 | 6 22 | 5 44 | 4 56 | 3 46 |
| − 9 20 | 8 35 | 8 22 | 8 7 | 7 50 | 7 29 | 7 6 | 6 38 | 6 3 | 5 19 | 4 17 |
| − 9 0 | 8 44 | 8 31 | 8 17 | 8 1 | 7 41 | 7 20 | 6 53 | 6 21 | 5 40 | 4 44 |
| − 8 40 | 8 53 | 8 41 | 8 27 | 8 11 | 7 53 | 7 33 | 7 8 | 6 38 | 6 0 | 5 10 |
| − 8 20 | 9 1 | 8 50 | 8 37 | 8 22 | 8 5 | 7 46 | 7 22 | 6 55 | 6 19 | 5 34 |
| − 8 0 | 9 10 | 8 59 | 8 47 | 8 33 | 8 17 | 7 59 | 7 36 | 7 11 | 6 38 | 5 56 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 60° | 61° | 62° | 63° | 64° | 65° | 66° | 67° | 68° | 69° | 70° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −8° 0′ | 10 21 | 10 17 | 10 12 | 10 7 | 10 2 | 9 56 | 9 50 | 9 43 | 9 36 | 9 28 | 9 19 |
| −7 40 | 10 26 | 10 22 | 10 17 | 10 13 | 10 8 | 10 2 | 9 56 | 9 50 | 9 43 | 9 35 | 9 27 |
| −7 20 | 10 31 | 10 27 | 10 23 | 10 18 | 10 13 | 10 8 | 10 3 | 9 57 | 9 50 | 9 43 | 9 35 |
| −7 0 | 10 35 | 10 32 | 10 28 | 10 23 | 10 19 | 10 14 | 10 9 | 10 4 | 9 57 | 9 50 | 9 43 |
| −6 40 | 10 40 | 10 37 | 10 33 | 10 29 | 10 25 | 10 20 | 10 15 | 10 10 | 10 4 | 9 57 | 9 51 |
| −6 20 | 10 45 | 10 42 | 10 38 | 10 34 | 10 31 | 10 26 | 10 22 | 10 16 | 10 11 | 10 5 | 9 58 |
| −6 0 | 10 50 | 10 47 | 10 43 | 10 40 | 10 36 | 10 32 | 10 28 | 10 23 | 10 18 | 10 12 | 10 6 |
| −5 40 | 10 55 | 10 52 | 10 49 | 10 45 | 10 41 | 10 38 | 10 34 | 10 29 | 10 25 | 10 19 | 10 14 |
| −5 20 | 10 59 | 10 56 | 10 54 | 10 50 | 10 47 | 10 44 | 10 40 | 10 36 | 10 31 | 10 26 | 10 21 |
| −5 0 | 11 4 | 11 1 | 10 59 | 10 56 | 10 53 | 10 50 | 10 46 | 10 42 | 10 38 | 10 34 | 10 29 |
| −4 40 | 11 8 | 11 6 | 11 4 | 11 1 | 10 58 | 10 55 | 10 52 | 10 49 | 10 45 | 10 41 | 10 36 |
| −4 20 | 11 13 | 11 11 | 11 9 | 11 7 | 11 4 | 11 1 | 10 58 | 10 55 | 10 52 | 10 48 | 10 44 |
| −4 0 | 11 18 | 11 16 | 11 14 | 11 12 | 11 10 | 11 7 | 11 4 | 11 1 | 10 58 | 10 55 | 10 51 |
| −3 40 | 11 22 | 11 21 | 11 19 | 11 17 | 11 15 | 11 13 | 11 10 | 11 8 | 11 5 | 11 2 | 10 59 |
| −3 20 | 11 27 | 11 26 | 11 24 | 11 22 | 11 20 | 11 19 | 11 16 | 11 14 | 11 11 | 11 9 | 11 6 |
| −3 0 | 11 32 | 11 31 | 11 29 | 11 28 | 11 26 | 11 24 | 11 22 | 11 20 | 11 18 | 11 16 | 11 13 |
| −2 40 | 11 37 | 11 35 | 11 34 | 11 33 | 11 31 | 11 30 | 11 28 | 11 27 | 11 25 | 11 23 | 11 21 |
| −2 20 | 11 41 | 11 40 | 11 39 | 11 38 | 11 37 | 11 36 | 11 34 | 11 33 | 11 32 | 11 30 | 11 28 |
| −2 0 | 11 46 | 11 45 | 11 44 | 11 43 | 11 43 | 11 41 | 11 40 | 11 40 | 11 38 | 11 37 | 11 35 |
| −1 40 | 11 50 | 11 50 | 11 49 | 11 49 | 11 48 | 11 47 | 11 46 | 11 46 | 11 45 | 11 44 | 11 43 |
| −1 20 | 11 55 | 11 55 | 11 54 | 11 54 | 11 53 | 11 53 | 11 52 | 11 52 | 11 52 | 11 51 | 11 50 |
| −1 0 | 11 59 | 11 59 | 11 59 | 11 59 | 11 59 | 11 59 | 11 58 | 11 58 | 11 58 | 11 58 | 11 58 |
| −0 40 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 4 | 12 5 | 12 5 | 12 5 |
| −0 20 | 12 9 | 12 9 | 12 9 | 12 10 | 12 10 | 12 10 | 12 10 | 12 11 | 12 11 | 12 12 | 12 12 |
| 0 0 | 12 13 | 12 14 | 12 14 | 12 15 | 12 15 | 12 16 | 12 16 | 12 17 | 12 18 | 12 19 | 12 19 |
| +0 20 | 12 18 | 12 19 | 12 19 | 12 20 | 12 20 | 12 22 | 12 22 | 12 23 | 12 25 | 12 26 | 12 27 |
| 0 40 | 12 22 | 12 23 | 12 24 | 12 25 | 12 26 | 12 27 | 12 28 | 12 29 | 12 31 | 12 33 | 12 34 |
| 1 0 | 12 27 | 12 28 | 12 29 | 12 31 | 12 32 | 12 33 | 12 34 | 12 36 | 12 38 | 12 40 | 12 41 |
| 1 20 | 12 32 | 12 33 | 12 34 | 12 36 | 12 37 | 12 39 | 12 40 | 12 42 | 12 44 | 12 47 | 12 49 |
| 1 40 | 12 37 | 12 38 | 12 39 | 12 41 | 12 43 | 12 44 | 12 46 | 12 49 | 12 51 | 12 54 | 12 56 |
| 2 0 | 12 41 | 12 43 | 12 44 | 12 46 | 12 48 | 12 50 | 12 52 | 12 55 | 12 58 | 13 1 | 13 4 |
| 2 20 | 12 46 | 12 47 | 12 49 | 12 52 | 12 53 | 12 56 | 12 59 | 13 1 | 13 4 | 13 8 | 13 11 |
| 2 40 | 12 50 | 12 52 | 12 54 | 12 57 | 12 59 | 13 2 | 13 5 | 13 7 | 13 11 | 13 15 | 13 19 |
| 3 0 | 12 55 | 12 57 | 12 59 | 13 2 | 13 5 | 13 8 | 13 11 | 13 14 | 13 17 | 13 22 | 13 26 |
| 3 20 | 13 0 | 13 2 | 13 5 | 13 7 | 13 10 | 13 13 | 13 17 | 13 20 | 13 24 | 13 29 | 13 34 |
| 3 40 | 13 4 | 13 7 | 13 10 | 13 13 | 13 16 | 13 19 | 13 23 | 13 27 | 13 31 | 13 36 | 13 41 |
| 4 0 | 13 9 | 13 12 | 13 15 | 13 18 | 13 22 | 13 25 | 13 29 | 13 33 | 13 38 | 13 43 | 13 49 |
| 4 20 | 13 14 | 13 17 | 13 20 | 13 23 | 13 27 | 13 31 | 13 35 | 13 40 | 13 45 | 13 50 | 13 56 |
| 4 40 | 13 19 | 13 22 | 13 25 | 13 29 | 13 32 | 13 37 | 13 41 | 13 46 | 13 52 | 13 58 | 14 4 |
| 5 0 | 13 23 | 13 27 | 13 30 | 13 34 | 13 38 | 13 43 | 13 47 | 13 53 | 13 58 | 14 5 | 14 11 |
| 5 20 | 13 28 | 13 32 | 13 35 | 13 40 | 13 44 | 13 49 | 13 54 | 13 59 | 14 5 | 14 12 | 14 19 |
| 5 40 | 13 33 | 13 37 | 13 41 | 13 45 | 13 50 | 13 55 | 14 0 | 14 6 | 14 12 | 14 19 | 14 27 |
| 6 0 | 13 38 | 13 42 | 13 46 | 13 50 | 13 55 | 14 1 | 14 6 | 14 13 | 14 19 | 14 26 | 14 35 |
| 6 20 | 13 43 | 13 47 | 13 51 | 13 56 | 14 1 | 14 7 | 14 12 | 14 19 | 14 26 | 14 34 | 14 43 |
| 6 40 | 13 47 | 13 52 | 13 56 | 14 1 | 14 7 | 14 13 | 14 18 | 14 26 | 14 33 | 14 42 | 14 51 |
| 7 0 | 13 52 | 13 57 | 14 1 | 14 7 | 14 12 | 14 19 | 14 25 | 14 32 | 14 40 | 14 49 | 14 59 |
| 7 20 | 13 57 | 14 2 | 14 7 | 14 13 | 14 18 | 14 25 | 14 31 | 14 39 | 14 48 | 14 57 | 15 7 |
| 7 40 | 14 2 | 14 7 | 14 12 | 14 18 | 14 24 | 14 31 | 14 38 | 14 46 | 14 55 | 15 4 | 15 15 |
| 8 0 | 14 7 | 14 12 | 14 17 | 14 23 | 14 30 | 14 37 | 14 45 | 14 52 | 15 2 | 15 12 | 15 23 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 71° | 72° | 73° | 74° | 75° | 76° | 77° | 78° | 79° | 80° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| −8° 0′ | 9 10 | 8 59 | 8 47 | 8 33 | 8 17 | 7 58 | 7 37 | 7 10 | 6 38 | 5 56 |
| −7 40 | 9 18 | 9 08 | 8 56 | 8 43 | 8 28 | 8 11 | 7 50 | 7 26 | 6 56 | 6 18 |
| −7 20 | 9 26 | 9 17 | 9 6 | 8 53 | 8 39 | 8 23 | 8 4 | 7 41 | 7 14 | 6 38 |
| −7 0 | 9 35 | 9 26 | 9 16 | 9 3 | 8 50 | 8 35 | 8 17 | 7 56 | 7 31 | 6 58 |
| −6 40 | 9 43 | 9 34 | 9 25 | 9 14 | 9 1 | 8 47 | 8 30 | 8 11 | 7 47 | 7 17 |
| −6 20 | 9 51 | 9 43 | 9 34 | 9 24 | 9 12 | 8 59 | 8 43 | 8 25 | 8 3 | 7 36 |
| −6 0 | 9 59 | 9 52 | 9 43 | 9 34 | 9 23 | 9 11 | 8 56 | 8 39 | 8 19 | 7 54 |
| −5 40 | 10 7 | 10 1 | 9 53 | 9 44 | 9 34 | 9 22 | 9 9 | 8 53 | 8 34 | 8 11 |
| −5 20 | 10 15 | 10 9 | 10 2 | 9 53 | 9 44 | 9 34 | 9 22 | 9 7 | 8 50 | 8 28 |
| −5 0 | 10 23 | 10 17 | 10 11 | 10 3 | 9 55 | 9 45 | 9 34 | 9 20 | 9 5 | 8 46 |
| −4 40 | 10 31 | 10 26 | 10 20 | 10 13 | 10 5 | 9 56 | 9 46 | 9 34 | 9 19 | 9 2 |
| −4 20 | 10 39 | 10 34 | 10 29 | 10 22 | 10 15 | 10 7 | 9 58 | 9 47 | 9 34 | 9 18 |
| −4 0 | 10 47 | 10 43 | 10 38 | 10 32 | 10 26 | 10 18 | 10 10 | 10 0 | 9 49 | 9 34 |
| −3 40 | 10 55 | 10 51 | 10 46 | 10 41 | 10 36 | 10 29 | 10 22 | 10 13 | 10 3 | 9 50 |
| −3 20 | 11 3 | 10 59 | 10 55 | 10 51 | 10 46 | 10 40 | 10 34 | 10 26 | 10 17 | 10 6 |
| −3 0 | 11 11 | 11 8 | 11 4 | 11 0 | 10 56 | 10 51 | 10 45 | 10 39 | 10 31 | 10 22 |
| −2 40 | 11 19 | 11 16 | 11 13 | 11 10 | 11 6 | 11 2 | 10 57 | 10 52 | 10 45 | 10 37 |
| −2 20 | 11 26 | 11 24 | 11 22 | 11 19 | 11 16 | 11 13 | 11 8 | 11 4 | 10 59 | 10 52 |
| −2 0 | 11 34 | 11 32 | 11 31 | 11 28 | 11 26 | 11 23 | 11 20 | 11 17 | 11 13 | 11 8 |
| −1 40 | 11 42 | 11 41 | 11 39 | 11 38 | 11 36 | 11 34 | 11 32 | 11 29 | 11 26 | 11 23 |
| −1 20 | 11 49 | 11 49 | 11 48 | 11 47 | 11 46 | 11 45 | 11 43 | 11 42 | 11 40 | 11 38 |
| −1 0 | 11 57 | 11 57 | 11 56 | 11 56 | 11 56 | 11 55 | 11 55 | 11 55 | 11 54 | 11 53 |
| −0 40 | 12 5 | 12 5 | 12 5 | 12 5 | 12 6 | 12 6 | 12 7 | 12 7 | 12 8 | 12 8 |
| −0 20 | 12 13 | 12 13 | 12 14 | 12 15 | 12 16 | 12 17 | 12 18 | 12 20 | 12 21 | 12 23 |
| 0 0 | 12 20 | 12 22 | 12 22 | 12 24 | 12 26 | 12 28 | 12 29 | 12 32 | 12 35 | 12 38 |
| +0 20 | 12 28 | 12 30 | 12 31 | 12 34 | 12 36 | 12 38 | 12 41 | 12 44 | 12 49 | 12 53 |
| 0 40 | 12 36 | 12 38 | 12 40 | 12 43 | 12 46 | 12 49 | 12 53 | 12 57 | 13 2 | 13 9 |
| 1 0 | 12 44 | 12 46 | 12 49 | 12 52 | 12 56 | 13 0 | 13 5 | 13 10 | 13 16 | 13 24 |
| 1 20 | 12 52 | 12 55 | 12 58 | 13 2 | 13 6 | 13 11 | 13 16 | 13 23 | 13 30 | 13 40 |
| 1 40 | 12 59 | 13 3 | 13 7 | 13 11 | 13 16 | 13 22 | 13 28 | 13 36 | 13 44 | 13 55 |
| 2 0 | 13 7 | 13 11 | 13 16 | 13 20 | 13 26 | 13 32 | 13 40 | 13 49 | 13 59 | 14 11 |
| 2 20 | 13 15 | 13 19 | 13 25 | 13 30 | 13 36 | 13 43 | 13 52 | 14 1 | 14 13 | 14 27 |
| 2 40 | 13 23 | 13 28 | 13 33 | 13 40 | 13 46 | 13 54 | 14 4 | 14 14 | 14 28 | 14 43 |
| 3 0 | 13 31 | 13 36 | 13 42 | 13 49 | 13 57 | 14 5 | 14 16 | 14 28 | 14 42 | 14 59 |
| 3 20 | 13 39 | 13 44 | 13 51 | 13 59 | 14 7 | 14 17 | 14 28 | 14 41 | 14 56 | 15 16 |
| 3 40 | 13 47 | 13 53 | 14 1 | 14 8 | 14 17 | 14 28 | 14 40 | 14 55 | 15 11 | 15 33 |
| 4 0 | 13 55 | 14 2 | 14 10 | 14 18 | 14 28 | 14 40 | 14 53 | 15 8 | 15 27 | 15 50 |
| 4 20 | 14 3 | 14 10 | 14 19 | 14 28 | 14 38 | 14 51 | 15 5 | 15 22 | 15 43 | 16 7 |
| 4 40 | 14 11 | 14 19 | 14 28 | 14 38 | 14 49 | 15 2 | 15 18 | 15 36 | 15 58 | 16 25 |
| 5 0 | 14 19 | 14 28 | 14 37 | 14 48 | 15 0 | 15 14 | 15 31 | 15 50 | 16 14 | 16 44 |
| 5 20 | 14 27 | 14 37 | 14 46 | 14 58 | 15 11 | 15 26 | 15 44 | 16 5 | 16 31 | 17 3 |
| 5 40 | 14 35 | 14 45 | 14 56 | 15 8 | 15 22 | 15 38 | 15 57 | 16 20 | 16 47 | 17 22 |
| 6 0 | 14 44 | 14 54 | 15 5 | 15 19 | 15 33 | 15 50 | 16 11 | 16 35 | 17 5 | 17 43 |
| 6 20 | 14 52 | 15 3 | 15 15 | 15 29 | 15 44 | 16 3 | 16 25 | 16 51 | 17 23 | 18 5 |
| 6 40 | 15 1 | 15 12 | 15 25 | 15 40 | 15 56 | 16 16 | 16 39 | 17 7 | 17 41 | 18 27 |
| 7 0 | 15 10 | 15 22 | 15 35 | 15 50 | 16 8 | 16 29 | 16 53 | 17 23 | 18 1 | 18 50 |
| 7 20 | 15 18 | 12 31 | 15 45 | 16 1 | 16 20 | 16 42 | 17 8 | 17 40 | 18 21 | 19 16 |
| 7 40 | 15 27 | 15 40 | 15 55 | 16 12 | 16 32 | 16 55 | 17 23 | 17 58 | 18 42 | 19 44 |
| 8 0 | 15 35 | 15 50 | 16 5 | 16 23 | 16 44 | 17 9 | 17 39 | 18 16 | 19 5 | 20 15 |

## DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | LATITUDE NORTH. | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 60° | 61° | 62° | 63° | 64° | 65° | 66° | 67° | 68° | 69° | 70° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| + 8° 0′ | 14 7 | 14 12 | 14 17 | 14 23 | 14 30 | 14 37 | 14 45 | 14 53 | 15 2 | 15 12 | 15 23 |
| 8 20 | 14 12 | 14 17 | 14 23 | 14 29 | 14 36 | 14 43 | 14 52 | 15 0 | 15 10 | 15 20 | 15 32 |
| 8 40 | 14 17 | 14 22 | 14 28 | 14 35 | 14 42 | 14 50 | 14 58 | 15 7 | 15 17 | 15 28 | 15 40 |
| 9 0 | 14 22 | 14 27 | 14 34 | 14 41 | 14 48 | 14 56 | 15 5 | 15 14 | 15 25 | 15 36 | 15 49 |
| 9 20 | 14 27 | 14 32 | 14 39 | 14 46 | 14 54 | 15 2 | 15 11 | 15 21 | 15 32 | 15 44 | 15 57 |
| 9 40 | 14 32 | 14 38 | 14 45 | 14 52 | 15 0 | 15 9 | 15 18 | 15 28 | 15 40 | 15 52 | 16 6 |
| 10 0 | 14 37 | 14 43 | 14 50 | 14 58 | 15 6 | 15 15 | 15 25 | 15 35 | 15 47 | 16 0 | 16 15 |
| 10 20 | 14 42 | 14 49 | 14 56 | 15 4 | 15 13 | 15 22 | 15 32 | 15 43 | 15 55 | 16 8 | 16 24 |
| 10 40 | 14 47 | 14 54 | 15 2 | 15 10 | 15 19 | 15 28 | 15 39 | 15 50 | 16 3 | 16 17 | 16 33 |
| 11 0 | 14 52 | 14 59 | 15 7 | 15 16 | 15 25 | 15 35 | 15 46 | 15 58 | 16 11 | 16 26 | 16 42 |
| 11 20 | 14 57 | 15 5 | 15 13 | 15 22 | 15 31 | 15 41 | 15 53 | 16 5 | 16 19 | 16 34 | 16 52 |
| 11 40 | 15 2 | 15 10 | 15 19 | 15 28 | 15 38 | 15 48 | 16 0 | 16 13 | 16 27 | 16 43 | 17 1 |
| 12 0 | 15 8 | 15 16 | 15 25 | 15 34 | 15 44 | 15 55 | 16 7 | 16 21 | 16 35 | 16 52 | 17 11 |
| 12 20 | 15 13 | 15 21 | 15 31 | 15 40 | 15 50 | 16 2 | 16 15 | 16 29 | 16 44 | 17 1 | 17 21 |
| 12 40 | 15 18 | 15 27 | 15 36 | 15 46 | 15 57 | 16 9 | 16 22 | 16 37 | 16 53 | 17 11 | 17 31 |
| 13 0 | 15 23 | 15 33 | 15 42 | 15 53 | 16 4 | 16 16 | 16 30 | 16 45 | 17 2 | 17 20 | 17 41 |
| 13 20 | 15 29 | 15 39 | 15 48 | 15 59 | 16 11 | 16 23 | 16 37 | 16 53 | 17 10 | 17 30 | 17 52 |
| 13 40 | 15 35 | 15 44 | 15 55 | 16 5 | 16 17 | 16 31 | 16 45 | 17 1 | 17 19 | 17 40 | 18 3 |
| 14 0 | 15 40 | 15 50 | 16 1 | 16 12 | 16 24 | 16 38 | 16 53 | 17 10 | 17 29 | 17 50 | 18 14 |
| 14 20 | 15 46 | 15 56 | 16 7 | 16 19 | 16 31 | 16 46 | 17 1 | 17 19 | 17 38 | 18 0 | 18 26 |
| 14 40 | 15 51 | 16 2 | 16 13 | 16 25 | 16 38 | 16 53 | 17 9 | 17 28 | 17 48 | 18 11 | 18 38 |
| 15 0 | 15 57 | 16 8 | 16 19 | 16 32 | 16 46 | 17 1 | 17 17 | 17 37 | 17 58 | 18 22 | 18 50 |
| 15 20 | 16 2 | 16 14 | 16 26 | 16 39 | 16 53 | 17 9 | 17 26 | 17 46 | 18 8 | 18 33 | 19 3 |
| 15 40 | 16 8 | 16 20 | 16 32 | 16 46 | 17 1 | 17 17 | 17 35 | 17 55 | 18 18 | 18 45 | 19 16 |
| 16 0 | 16 14 | 16 26 | 16 39 | 16 53 | 17 8 | 17 25 | 17 44 | 18 5 | 18 29 | 18 57 | 19 30 |
| 16 20 | 16 20 | 16 32 | 16 46 | 17 0 | 17 16 | 17 33 | 17 53 | 18 15 | 18 40 | 19 10 | 19 45 |
| 16 40 | 16 26 | 16 39 | 16 52 | 17 7 | 17 23 | 17 41 | 18 2 | 18 25 | 18 51 | 19 23 | 20 1 |
| 17 0 | 16 32 | 16 45 | 16 59 | 17 14 | 17 31 | 17 50 | 18 11 | 18 35 | 19 3 | 19 36 | 20 17 |
| 17 20 | 16 38 | 16 52 | 17 6 | 17 22 | 17 39 | 17 59 | 18 21 | 18 46 | 19 15 | 19 50 | 20 35 |
| 17 40 | 16 45 | 16 58 | 17 13 | 17 29 | 17 47 | 18 8 | 18 31 | 18 57 | 19 28 | 20 6 | 20 55 |
| 18 0 | 16 51 | 17 5 | 17 20 | 17 37 | 17 56 | 18 17 | 18 41 | 19 8 | 19 41 | 20 22 | 21 17 |
| 18 20 | 16 58 | 17 12 | 17 28 | 17 45 | 18 5 | 18 26 | 18 52 | 19 20 | 19 55 | 20 40 | 21 42 |
| 18 40 | 17 4 | 17 19 | 17 35 | 17 53 | 18 14 | 18 36 | 19 3 | 19 33 | 20 10 | 20 59 | 22 13 |
| 19 0 | 17 11 | 17 26 | 17 43 | 18 2 | 18 23 | 18 46 | 19 14 | 19 46 | 20 26 | 21 20 | 22 58 |
| 19 20 | 17 17 | 17 33 | 17 51 | 18 10 | 18 32 | 18 56 | 19 25 | 20 0 | 20 44 | 21 45 | |
| 19 40 | 17 24 | 17 41 | 17 59 | 18 19 | 18 41 | 19 7 | 19 37 | 20 14 | 21 3 | 22 16 | |
| 20 0 | 17 31 | 17 48 | 18 7 | 18 28 | 18 51 | 19 19 | 19 50 | 20 30 | 21 23 | 22 59 | |
| 20 20 | 17 38 | 17 56 | 18 15 | 18 37 | 19 1 | 19 30 | 20 4 | 20 47 | 24 47 | | |
| 20 40 | 17 45 | 18 4 | 18 23 | 18 46 | 19 12 | 19 42 | 20 19 | 21 5 | 22 17 | | |
| 21 0 | 17 52 | 18 11 | 18 32 | 18 56 | 19 23 | 19 25 | 20 34 | 21 26 | 23 1 | | |
| 21 20 | 18 0 | 18 20 | 18 41 | 19 6 | 19 34 | 20 8 | 20 50 | 21 50 | | | |
| 21 40 | 18 8 | 18 28 | 18 50 | 19 16 | 19 46 | 20 22 | 21 8 | 22 19 | | | |
| 22 0 | 18 16 | 18 37 | 19 0 | 19 27 | 19 58 | 20 37 | 21 29 | 23 2 | | | |
| 22 20 | 18 24 | 18 46 | 19 10 | 19 38 | 20 11 | 20 53 | 21 52 | | | | |
| 22 40 | 18 32 | 18 55 | 19 20 | 19 50 | 20 25 | 21 11 | 22 21 | | | | |
| 23 0 | 18 41 | 19 4 | 19 31 | 20 2 | 20 40 | 21 31 | 23 3 | | | | |
| 23 20 | 18 49 | 19 13 | 19 41 | 20 14 | 20 56 | 21 54 | | | | | |
| 23 27 | 18 52 | 19 17 | 19 46 | 20 19 | 21 2 | 22 3 | | | | | |

## Table 87.

### DURATION OF SUNSHINE AT DIFFERENT LATITUDES.

| Declination of the Sun. | Latitude North. 71° | 72° | 73° | 74° | 75° |
|---|---|---|---|---|---|
| | h. m. | h. m. | h. m. | h. m. | h. m. |
| + 8° 0′ | 15 35 | 15 50 | 16 5 | 16 23 | 16 44 |
| 8 20 | 15 44 | 15 59 | 16 16 | 16 35 | 16 57 |
| 8 40 | 15 53 | 16 9 | 16 26 | 16 46 | 17 10 |
| **9 0** | 16 3 | 16 19 | 16 37 | 16 58 | 17 23 |
| 9 20 | 16 12 | 16 29 | 16 48 | 17 10 | 17 37 |
| 9 40 | 16 22 | 16 39 | 16 59 | 17 23 | 17 51 |
| **10 0** | 16 31 | 16 50 | 17 11 | 17 35 | 18 5 |
| 10 20 | 16 41 | 17 0 | 17 22 | 17 49 | 18 20 |
| 10 40 | 16 50 | 17 11 | 17 34 | 18 2 | 18 36 |
| **11 0** | 17 1 | 17 22 | 17 47 | 18 16 | 18 52 |
| 11 20 | 17 11 | 17 34 | 17 59 | 18 31 | 19 9 |
| 11 40 | 17 22 | 17 45 | 18 13 | 18 46 | 19 27 |
| **12 0** | 17 32 | 17 57 | 18 26 | 19 1 | 19 46 |
| 12 20 | 17 43 | 18 9 | 18 40 | 19 18 | 20 7 |
| 12 40 | 17 55 | 18 22 | 18 55 | 19 35 | 20 29 |
| **13 0** | 18 6 | 18 35 | 19 11 | 19 54 | 20 55 |
| 13 20 | 18 18 | 18 49 | 19 26 | 20 14 | 21 23 |
| 13 40 | 18 30 | 19 2 | 19 43 | 20 35 | 21 59 |
| **14 0** | 18 43 | 19 17 | 20 1 | 21 0 | 22 50 |
| 14 20 | 18 56 | 19 33 | 20 20 | 21 28 | |
| 14 40 | 19 10 | 19 49 | 20 41 | 22 2 | |
| **15 0** | 19 24 | 20 7 | 21 5 | 22 52 | |
| 15 20 | 19 40 | 20 26 | 21 32 | | |
| 15 40 | 19 55 | 20 46 | 22 5 | | |
| **16 0** | 20 13 | 21 10 | 22 54 | | |
| 16 20 | 20 31 | 21 36 | | | |
| 16 40 | 20 51 | 22 8 | | | |
| **17 0** | 21 13 | 22 56 | | | |
| 17 20 | 21 39 | | | | |
| 17 40 | 22 11 | | | | |

| Declination of the Sun. | 76° | 77° | 78° | 79° | 80° |
|---|---|---|---|---|---|
| + 8° 0′ | 17 9 | 17 39 | 18 16 | 19 5 | 20 15 |
| 8 20 | 17 23 | 17 55 | 18 35 | 19 29 | 20 50 |
| 8 40 | 17 38 | 18 12 | 18 56 | 19 56 | 21 33 |
| **9 0** | 17 53 | 18 30 | 19 17 | 20 25 | 22 35 |
| 9 20 | 18 8 | 18 48 | 19 41 | 20 59 | |
| 9 40 | 18 25 | 19 8 | 20 6 | 21 40 | |
| **10 0** | 18 41 | 19 28 | 20 31 | 22 39 | |
| 10 20 | 18 59 | 19 50 | 21 6 | | |
| 10 40 | 19 18 | 20 15 | 21 46 | | |
| **11 0** | 19 38 | 20 41 | 22 43 | | |
| 11 20 | 19 59 | 21 13 | | | |
| 11 40 | 20 23 | 21 50 | | | |
| **12 0** | 20 49 | 22 46 | | | |
| 12 20 | 21 19 | | | | |
| 12 40 | 21 55 | | | | |

## Table 88.

### DECLINATION OF THE SUN FOR THE YEAR 1899.

| Day of Month. | *Jan.* | *Feb.* | *Mar.* |
|---|---|---|---|
| 1 | —23° 0′ | —17° 4′ | — 7° 33′ |
| 4 | —22 44 | 16 12 | 6 24 |
| 7 | 22 22 | 15 16 | 5 14 |
| 10 | 21 57 | 14 19 | 4 4 |
| 13 | 21 28 | 13 19 | 2 53 |
| 16 | 20 55 | 12 18 | 1 42 |
| 19 | 20 19 | 11 14 | — 0 31 |
| 21 | 19 53 | 10 31 | + 0 16 |
| 24 | 19 11 | 9 25 | 1 27 |
| 27 | 18 26 | 8 18 | 2 38 |
| 30 | 17 38 | ...... | 3 48 |

| Day of Month. | *Apr.* | *May.* | *June.* |
|---|---|---|---|
| 1 | + 4° 34′ | +15° 6′ | +22° 4′ |
| 4 | 5 43 | 15 59 | 22 27 |
| 7 | 6 51 | 16 50 | 22 46 |
| 10 | 7 58 | 17 38 | 23 1 |
| 13 | 9 4 | 18 24 | 23 13 |
| 16 | 10 9 | 19 7 | 23 22 |
| 19 | 11 12 | 19 47 | 23 26 |
| 21 | 11 53 | 20 12 | 23 27 |
| 24 | 12 53 | 20 47 | 23 25 |
| 27 | 13 51 | 21 19 | 23 20 |
| 30 | 14 48 | 21 47 | 23 11 |

| Day of Month. | *July.* | *Aug.* | *Sept.* |
|---|---|---|---|
| 1 | +23° 7′ | +18° 1′ | + 8° 17′ |
| 4 | 22 53 | 17 15 | 7 11 |
| 7 | 22 36 | 16 26 | 6 4 |
| 10 | 22 15 | 15 34 | 4 56 |
| 13 | 21 50 | 14 40 | 3 47 |
| 16 | 21 22 | 13 44 | 2 38 |
| 19 | 20 51 | 12 46 | 1 28 |
| 21 | 20 29 | 12 7 | + 0 42 |
| 24 | 19 52 | 11 6 | — 0 29 |
| 27 | 19 13 | 10 4 | 1 39 |
| 30 | 18 31 | 9 0 | 2 49 |

| Day of Month. | *Oct.* | *Nov.* | *Dec.* |
|---|---|---|---|
| 1 | — 3° 12′ | —14° 27′ | —21° 50′ |
| 4 | 4 22 | 15 24 | 22 16 |
| 7 | 5 31 | 16 18 | 22 38 |
| 10 | 6 40 | 17 10 | 22 56 |
| 13 | 7 48 | 18 0 | 23 10 |
| 16 | 8 55 | 18 46 | 23 20 |
| 19 | 10 0 | 19 29 | 23 26 |
| 21 | 10 43 | 19 56 | 23 27 |
| 24 | 11 47 | 20 35 | 23 26 |
| 27 | 12 48 | 21 9 | 23 20 |
| 30 | 13 49 | 21 40 | 23 10 |

## DURATION OF ASTRONOMICAL TWILIGHT.

(Interval between sunrise or sunset and the time when the true position of the sun's center is 18° below the horizon.)

| Date. | NORTH LATITUDE. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0° | 10° | 20° | 25° | 30° | 32° | 34° | 36° | 38° | 40° | 42° | 44° | 46° | 48° | 50° |
| | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. | h. m. |
| Jan. 1 | 1 14 | 1 15 | 1 18 | 1 21 | 1 26 | 1 28 | 1 29 | 1 31 | 1 34 | 1 37 | 1 41 | 1 45 | 1 49 | 1 53 | 1 59 |
| 11 | 1 14 | 1 14 | 1 18 | 1 21 | 1 25 | 1 27 | 1 29 | 1 31 | 1 33 | 1 36 | 1 39 | 1 43 | 1 47 | 1 52 | 1 57 |
| 21 | 1 13 | 1 13 | 1 17 | 1 20 | 1 23 | 1 25 | 1 28 | 1 30 | 1 32 | 1 34 | 1 38 | 1 41 | 1 45 | 1 49 | 1 54 |
| Feb. 1 | 1 12 | 1 12 | 1 15 | 1 18 | 1 22 | 1 24 | 1 26 | 1 28 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 47 | 1 52 |
| 11 | 1 11 | 1 12 | 1 14 | 1 17 | 1 21 | 1 23 | 1 25 | 1 27 | 1 29 | 1 32 | 1 34 | 1 37 | 1 41 | 1 45 | 1 49 |
| 21 | 1 10 | 1 11 | 1 13 | 1 16 | 1 20 | 1 22 | 1 24 | 1 26 | 1 28 | 1 31 | 1 33 | 1 36 | 1 40 | 1 44 | 1 48 |
| Mar. 1 | 1 10 | 1 11 | 1 13 | 1 16 | 1 20 | 1 21 | 1 23 | 1 25 | 1 28 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 |
| 11 | 1 09 | 1 10 | 1 13 | 1 16 | 1 19 | 1 21 | 1 23 | 1 25 | 1 28 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 |
| 21 | 1 09 | 1 10 | 1 13 | 1 16 | 1 20 | 1 22 | 1 24 | 1 26 | 1 29 | 1 31 | 1 34 | 1 37 | 1 41 | 1 45 | 1 50 |
| Apr. 1 | 1 09 | 1 11 | 1 14 | 1 17 | 1 21 | 1 23 | 1 25 | 1 27 | 1 30 | 1 33 | 1 36 | 1 40 | 1 44 | 1 49 | 1 54 |
| 11 | 1 10 | 1 11 | 1 15 | 1 18 | 1 22 | 1 24 | 1 27 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 00 |
| 21 | 1 11 | 1 12 | 1 16 | 1 20 | 1 24 | 1 27 | 1 29 | 1 32 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 01 | 2 08 |
| May 1 | 1 12 | 1 13 | 1 18 | 1 22 | 1 27 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 01 | 2 10 | 2 20 |
| 11 | 1 13 | 1 14 | 1 19 | 1 24 | 1 30 | 1 33 | 1 36 | 1 40 | 1 43 | 1 48 | 1 54 | 2 01 | 2 10 | 2 20 | 2 35 |
| 21 | 1 13 | 1 15 | 1 21 | 1 26 | 1 32 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 01 | 2 10 | 2 20 | 2 35 | 2 58 |
| June 1 | 1 14 | 1 16 | 1 23 | 1 28 | 1 35 | 1 38 | 1 41 | 1 46 | 1 52 | 1 59 | 2 07 | 2 18 | 2 31 | 2 54 | |
| 11 | 1 15 | 1 17 | 1 24 | 1 29 | 1 36 | 1 40 | 1 44 | 1 49 | 1 55 | 2 02 | 2 12 | 2 23 | 2 40 | 3 11 | |
| 21 | 1 15 | 1 18 | 1 24 | 1 29 | 1 37 | 1 41 | 1 45 | 1 50 | 1 56 | 2 03 | 2 13 | 2 25 | 2 44 | 3 19 | |
| July 1 | 1 15 | 1 17 | 1 24 | 1 29 | 1 36 | 1 40 | 1 44 | 1 49 | 1 55 | 2 02 | 2 12 | 2 23 | 2 40 | 3 10 | |
| 11 | 1 14 | 1 16 | 1 23 | 1 28 | 1 35 | 1 38 | 1 41 | 1 46 | 1 52 | 1 59 | 2 07 | 2 18 | 2 31 | 2 54 | |
| 21 | 1 13 | 1 15 | 1 21 | 1 26 | 1 32 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 01 | 2 10 | 2 21 | 2 36 | 3 00 |
| Aug. 1 | 1 13 | 1 14 | 1 19 | 1 24 | 1 30 | 1 33 | 1 36 | 1 40 | 1 44 | 1 48 | 1 54 | 2 02 | 2 10 | 2 20 | 2 35 |
| 11 | 1 12 | 1 13 | 1 18 | 1 22 | 1 27 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 01 | 2 10 | 2 20 |
| 21 | 1 11 | 1 12 | 1 16 | 1 20 | 1 24 | 1 27 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 | 1 54 | 2 01 | 2 09 |
| Sept. 1 | 1 10 | 1 11 | 1 14 | 1 18 | 1 22 | 1 24 | 1 27 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 | 1 53 | 2 00 |
| 11 | 1 09 | 1 11 | 1 13 | 1 17 | 1 21 | 1 23 | 1 25 | 1 27 | 1 30 | 1 33 | 1 36 | 1 39 | 1 44 | 1 49 | 1 54 |
| 21 | 1 09 | 1 10 | 1 13 | 1 16 | 1 20 | 1 22 | 1 24 | 1 26 | 1 29 | 1 31 | 1 34 | 1 37 | 1 41 | 1 45 | 1 50 |
| Oct. 1 | 1 09 | 1 10 | 1 13 | 1 16 | 1 19 | 1 21 | 1 23 | 1 25 | 1 28 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 |
| 11 | 1 10 | 1 11 | 1 13 | 1 16 | 1 19 | 1 21 | 1 23 | 1 25 | 1 28 | 1 30 | 1 33 | 1 36 | 1 39 | 1 43 | 1 48 |
| 21 | 1 10 | 1 11 | 1 13 | 1 16 | 1 20 | 1 22 | 1 24 | 1 26 | 1 28 | 1 31 | 1 33 | 1 36 | 1 40 | 1 44 | 1 48 |
| Nov. 1 | 1 11 | 1 12 | 1 14 | 1 17 | 1 21 | 1 23 | 1 25 | 1 27 | 1 29 | 1 32 | 1 34 | 1 38 | 1 41 | 1 46 | 1 49 |
| 11 | 1 12 | 1 12 | 1 16 | 1 18 | 1 22 | 1 24 | 1 26 | 1 28 | 1 30 | 1 33 | 1 36 | 1 40 | 1 43 | 1 47 | 1 52 |
| 21 | 1 13 | 1 13 | 1 17 | 1 20 | 1 24 | 1 26 | 1 28 | 1 30 | 1 32 | 1 35 | 1 38 | 1 42 | 1 46 | 1 49 | 1 55 |
| Dec. 1 | 1 14 | 1 14 | 1 18 | 1 21 | 1 25 | 1 27 | 1 29 | 1 31 | 1 33 | 1 36 | 1 40 | 1 44 | 1 47 | 1 52 | 1 57 |
| 11 | 1 14 | 1 15 | 1 18 | 1 22 | 1 26 | 1 28 | 1 30 | 1 32 | 1 34 | 1 37 | 1 41 | 1 45 | 1 49 | 1 53 | 1 59 |
| 21 | 1 15 | 1 16 | 1 19 | 1 22 | 1 26 | 1 28 | 1 30 | 1 32 | 1 35 | 1 38 | 1 41 | 1 45 | 1 49 | 1 54 | 1 59 |

## DURATION OF CIVIL TWILIGHT.

(Interval between sunrise or sunset and the time when the true position of the sun's center is 6° below the horizon.)

[Minutes.]

| Date. | North Latitude. | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0° | 10° | 20° | 25° | 30° | 32° | 34° | 36° | 38° | 40° | 42° | 44° | 46° | 48° | 50° |
| Jan. 1 | 22 | 22 | 24 | 25 | 27 | 27 | 28 | 28 | 29 | 30 | 32 | 33 | 34 | 36 | 39 |
| 11 | 22 | 22 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 32 | 33 | 35 | 38 |
| 21 | 22 | 22 | 23 | 24 | 26 | 26 | 27 | 27 | 28 | 29 | 30 | 32 | 33 | 34 | 37 |
| Feb. 1 | 22 | 22 | 23 | 24 | 25 | 26 | 27 | 27 | 27 | 28 | 29 | 31 | 32 | 34 | 35 |
| 11 | 22 | 22 | 22 | 23 | 25 | 26 | 26 | 27 | 27 | 28 | 29 | 30 | 31 | 33 | 34 |
| 21 | 21 | 22 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 33 |
| Mar. 1 | 21 | 22 | 22 | 23 | 24 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 33 |
| 11 | 21 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 29 | 30 | 31 | 32 |
| 21 | 21 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 28 | 30 | 31 | 33 |
| Apr. 1 | 21 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 33 |
| 11 | 21 | 22 | 22 | 23 | 24 | 25 | 26 | 26 | 27 | 28 | 28 | 29 | 31 | 32 | 34 |
| 21 | 22 | 22 | 22 | 23 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 34 | 35 |
| May 1 | 22 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 33 | 35 | 36 |
| 11 | 22 | 22 | 23 | 24 | 26 | 27 | 28 | 29 | 29 | 30 | 31 | 33 | 35 | 36 | 39 |
| 21 | 22 | 22 | 24 | 25 | 27 | 28 | 28 | 29 | 30 | 31 | 33 | 35 | 36 | 38 | 41 |
| June 1 | 22 | 22 | 24 | 25 | 27 | 28 | 28 | 29 | 31 | 32 | 34 | 36 | 37 | 40 | 43 |
| 11 | 22 | 23 | 24 | 26 | 28 | 28 | 29 | 30 | 31 | 33 | 34 | 36 | 38 | 41 | 44 |
| 21 | 22 | 23 | 25 | 26 | 28 | 29 | 29 | 30 | 31 | 33 | 34 | 36 | 38 | 42 | 44 |
| July 1 | 22 | 23 | 24 | 26 | 28 | 28 | 29 | 30 | 31 | 33 | 34 | 36 | 38 | 41 | 44 |
| 11 | 22 | 22 | 24 | 25 | 27 | 28 | 28 | 29 | 31 | 32 | 34 | 36 | 37 | 40 | 43 |
| 21 | 22 | 22 | 24 | 25 | 27 | 28 | 28 | 29 | 30 | 31 | 33 | 35 | 36 | 38 | 41 |
| Aug. 1 | 22 | 22 | 23 | 24 | 26 | 27 | 28 | 29 | 29 | 30 | 31 | 33 | 35 | 36 | 39 |
| 11 | 22 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 33 | 35 | 36 |
| 21 | 22 | 22 | 22 | 23 | 25 | 25 | 26 | 28 | 28 | 28 | 29 | 30 | 32 | 34 | 35 |
| Sept. 1 | 21 | 22 | 22 | 23 | 24 | 25 | 26 | 26 | 27 | 28 | 28 | 29 | 31 | 32 | 34 |
| 11 | 21 | 21 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 33 |
| 21 | 21 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 29 | 30 | 31 | 32 |
| Oct. 1 | 21 | 21 | 22 | 23 | 24 | 24 | 25 | 26 | 26 | 27 | 27 | 29 | 30 | 31 | 32 |
| 11 | 21 | 22 | 22 | 23 | 24 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 33 |
| 21 | 21 | 22 | 22 | 23 | 24 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 33 |
| Nov. 1 | 22 | 22 | 22 | 23 | 25 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 33 | 34 |
| 11 | 22 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 32 | 33 | 35 |
| 21 | 22 | 22 | 23 | 24 | 26 | 26 | 27 | 28 | 28 | 29 | 30 | 32 | 33 | 34 | 37 |
| Dec. 1 | 22 | 22 | 24 | 25 | 26 | 27 | 28 | 28 | 29 | 30 | 31 | 33 | 34 | 35 | 38 |
| 11 | 22 | 22 | 24 | 25 | 27 | 27 | 28 | 28 | 29 | 30 | 32 | 33 | 34 | 36 | 39 |
| 21 | 22 | 23 | 24 | 25 | 27 | 27 | 28 | 28 | 29 | 31 | 32 | 33 | 34 | 37 | 39 |

## RELATIVE INTENSITY OF SOLAR RADIATION.

Mean intensity $J$ for 24 hours of solar radiation on a horizontal surface at the top of the atmosphere and the solar constant $A$, in terms of the mean solar constant $A_0$.

| Date. | Longitude of the Sun. | Relative Mean Vertical Intensity $\left(\frac{J}{A_0}\right)$. Latitude North. | | | | | | | | | | $\frac{A}{A_0}$. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0° | 10° | 20° | 30° | 40° | 50° | 60° | 70° | 80° | 90° | |
| *Jan.* 1 | 0°.99 | 0.303 | 0.265 | 0.220 | 0.169 | 0.117 | 0.066 | 0.018 | | | | 1.0335 |
| 16 | 15.78 | .307 | .271 | .229 | .180 | .129 | .078 | .028 | | | | 1.0324 |
| *Feb.* 1 | 31.54 | .312 | .282 | .244 | .200 | .150 | .100 | .048 | 0.006 | | | 1.0288 |
| 15 | 45.34 | .317 | .293 | .261 | .223 | .177 | .118 | .075 | .027 | | | 1.0235 |
| *Mar.* 1 | 59.14 | .320 | .303 | .279 | .245 | .204 | .158 | .108 | .056 | 0.013 | | 1.0173 |
| 16 | 73.93 | .321 | .313 | .296 | .270 | .236 | .195 | .148 | .097 | .057 | | 1.0096 |
| *Apr.* 1 | 89.70 | .317 | .319 | .312 | .295 | .269 | .235 | .195 | .148 | .101 | 0.082 | 1.0009 |
| 16 | 104.49 | .311 | .321 | .323 | .315 | .297 | .271 | .238 | .201 | .175 | .177 | 0.9923 |
| *May* 1 | 119.29 | .303 | .318 | .330 | .329 | .320 | .302 | .278 | .253 | .255 | .259 | 0.9841 |
| 16 | 134.05 | .294 | .318 | .333 | .339 | .337 | .327 | .312 | .298 | .317 | .322 | 0.9772 |
| *June* 1 | 149.82 | .287 | .315 | .334 | .345 | .349 | .345 | .337 | .344 | .360 | .366 | 0.9714 |
| 16 | 164.60 | .283 | .313 | .334 | .348 | .354 | .353 | .348 | .361 | .378 | .384 | 0.9679 |
| *July* 1 | 179.39 | .283 | .312 | .333 | .347 | .352 | .351 | .345 | .356 | .373 | .379 | 0.9666 |
| 16 | 194.13 | .287 | .314 | .332 | .342 | .345 | .340 | .329 | .331 | .347 | .352 | 0.9674 |
| *Aug.* 1 | 209.94 | .294 | .316 | .330 | .334 | .330 | .318 | .300 | .282 | .295 | .300 | 0.9709 |
| 16 | 224.73 | .303 | .318 | .325 | .322 | .310 | .291 | .264 | .234 | .227 | .231 | 0.9760 |
| *Sept.* 1 | 240.50 | .310 | .318 | .316 | .305 | .285 | .256 | .220 | .180 | .139 | .140 | 0.9828 |
| 16 | 255.29 | .315 | .315 | .305 | .284 | .256 | .220 | .178 | .130 | .107 | .043 | 0.9909 |
| *Oct.* 1 | 270.07 | .317 | .308 | .289 | .261 | .225 | .183 | .135 | .084 | .065 | | 0.9995 |
| 16 | 284.86 | .316 | .298 | .271 | .236 | .194 | .147 | .097 | .047 | .015 | | 1.0080 |
| *Nov.* 1 | 300.63 | .312 | .286 | .251 | .211 | .164 | .114 | .063 | .018 | | | 1.0164 |
| 16 | 315.42 | .308 | .276 | .235 | .190 | .140 | .089 | .040 | | | | 1.0235 |
| *Dec.* 1 | 330.19 | .304 | .267 | .224 | .175 | .124 | .072 | .024 | | | | 1.0288 |
| 16 | 344.98 | .302 | .263 | .218 | .167 | .115 | .064 | .016 | | | | 1.0323 |
| *Year*..... | | 0.305 | 0.301 | 0.289 | 0.268 | 0.241 | 0.209 | 0.173 | 0.144 | 0.133 | 0.126 | |

TABLE 92.

## RELATIVE AMOUNTS OF SOLAR RADIATION RECEIVED ON A HORIZONTAL SURFACE DURING THE YEAR AT DIFFERENT LATITUDES.

| Latitude. (North.) | Atmospheric transmission coefficient. | | | | |
|---|---|---|---|---|---|
| | 1.0 | 0.9 | 0.8 | 0.7 | 0.6 |
| Equator. | 439 | 374 | 316 | 262 | 213 |
| 10° | 433 | 368 | 310 | 257 | 209 |
| 20° | 416 | 350 | 293 | 242 | 195 |
| 30° | 386 | 322 | 266 | 213 | 171 |
| 40° | 347 | 284 | 231 | 185 | 144 |
| 50° | 301 | 239 | 190 | 149 | 114 |
| 60° | 249 | 191 | 148 | 113 | 84 |
| 70° | 207 | 152 | 113 | 83 | 60 |
| 80° | 192 | 134 | 94 | 64 | 43 |
| 90° | 181 | 125 | 85 | 56 | 35 |

TABLE 93.

## AIR MASS, M, CORRESPONDING TO DIFFERENT ZENITH DISTANCES OF THE SUN.

| Sun's zenith distance. | Sun's zenith distance. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0° | 1° | 2° | 3° | 4° | 5° | 6° | 7° | 8° | 9° |
| | Air mass. | | | | | | | | | |
| 0 | 1.00 | | | | | | | | | |
| 10 | 1.02 | | | | | 1.04 | | | | |
| 20 | 1.06 | 1.07 | 1.08 | 1.09 | 1.09 | 1.10 | 1.11 | 1.12 | 1.13 | 1.14 |
| 30 | 1.15 | 1.17 | 1.18 | 1.19 | 1.20 | 1.22 | 1.24 | 1.25 | 1.27 | 1.28 |
| 40 | 1.30 | 1.32 | 1.34 | 1.37 | 1.39 | 1.41 | 1.44 | 1.46 | 1.49 | 1.52 |
| 50 | 1.55 | 1.59 | 1.62 | 1.66 | 1.70 | 1.74 | 1.78 | 1.83 | 1.88 | 1.94 |
| 60 | 2.00 | 2.06 | 2.12 | 2.20 | 2.27 | 2.36 | 2.45 | 2.55 | 2.65 | 2.77 |
| 70 | 2.90 | 3.05 | 3.21 | 3.39 | 3.59 | 3.82 | 4.08 | 4.37 | 4.72 | 5.12 |
| 80 | 5.60 | 6.18 | 6.88 | 7.77 | 8.90 | 10.39 | 12.44 | 15.36 | 19.79 | 26.96 |

TABLE 94.

## RELATIVE ILLUMINATION INTENSITIES.

| Source of illumination. | Intensity. | Ratio to zenithal full moon. |
|---|---|---|
| | Foot-candles. | |
| Zenithal sun | 9600.0 | 465000.0 |
| Sky at sunset | 33.00 | 1650.0 |
| Sky at end of civil twilight | 0.40 | 20.0 |
| Zenithal full moon | 0.02 | 1.0 |
| Quarter moon | 0.002 | 0.1 |
| Starlight | 0.00008 | 0.004 |

# MISCELLANEOUS TABLES.

WEIGHT IN GRAMS OF A CUBIC CENTIMETER OF AIR:

English measures — Temperature term . . . . . . . TABLE 95

Humidity term; auxiliary table . . TABLE 96

Humidity and pressure terms, combined . . . . . . . . . . TABLE 97

Metric measures — Temperature term . . . . . . . TABLE 98

Humidity term; auxiliary table . . TABLE 99

Humidity and pressure terms, combined . . . . . . . . . . TABLE 100

Atmospheric water-vapor lines in the visible spectrum . . . TABLE 101

Atmospheric water-vapor bands in the infra-red spectrum . TABLE 102

Transmission percentages of radiation through moist air . . TABLE 103

International Meteorological Symbols . . . . . . . . . TABLE 104

International Cloud Classification . . . . . . . . . . TABLE 105

Beaufort Weather Notation . . . . . . . . . . . . . TABLE 106

List of meteorological stations . . . . . . . . . . . . TABLE 107

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Temperature term: $\delta_t = \dfrac{0.00129305}{1 + 0.0020389\,(t - 32^\circ)}$. Fahrenheit temperatures.

1 cubic centimeter of dry air at the temperature 32°F. and pressure 760 mm., under the standard value of gravity, weighs 0.00129305 gram.

| Temperature. | $\delta_t$ | Log $\delta_t$ | Temperature. | $\delta_t$ | Log $\delta_t$ | Temperature. | $\delta_t$ | Log $\delta_t$ |
|---|---|---|---|---|---|---|---|---|
| F. | 0.00 | — 10 | F. | 0.00 | — 10 | F. | 0.00 | — 10 |
| —45° | 15339 | 7.18579 | 30° | 12983 | 7.11339 | 75° | 11888 | 7.07512 |
| —40 | 15155 | .18056 | 31 | 12957 | .11250 | 76 | 11866 | .07430 |
| —35 | 14977 | .17541 | 32 | 12931 | .11162 | 77 | 11844 | .07349 |
| —30 | 14802 | .17031 | 33 | 12904 | .11073 | 78 | 11822 | .07268 |
| —25 | 14631 | .16527 | 34 | 12878 | .10985 | 79 | 11800 | .07187 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| —20 | 14464 | 7.16029 | 35 | 12852 | 7.10897 | 80 | 11778 | 7.07107 |
| —18 | 14398 | .15831 | 36 | 12826 | .10809 | 81 | 11756 | .07026 |
| —16 | 14333 | .15634 | 37 | 12800 | .10721 | 82 | 11734 | .06946 |
| —14 | 14269 | .15439 | 38 | 12774 | .10633 | 83 | 11713 | .06865 |
| —12 | 14205 | .15244 | 39 | 12749 | .10546 | 84 | 11691 | .06785 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| —10 | 14142 | 7.15050 | 40 | 12723 | 7.10459 | 85 | 11670 | 7.06705 |
| — 8 | 14079 | .14856 | 41 | 12698 | .10372 | 86 | 11648 | .06625 |
| — 6 | 14017 | .14664 | 42 | 12672 | .10285 | 87 | 11627 | .06546 |
| — 4 | 13955 | .14472 | 43 | 12647 | .10198 | 88 | 11605 | .06466 |
| — 2 | 13894 | .14282 | 44 | 12622 | .10112 | 89 | 11584 | .06387 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| + 0 | 13833 | 7.14092 | 45 | 12597 | 7.10025 | 90 | 11563 | 7.06307 |
| 1 | 13803 | .13997 | 46 | 12572 | .09939 | 91 | 11542 | .06228 |
| 2 | 13773 | .13903 | 47 | 12547 | .09853 | 92 | 11521 | .06149 |
| 3 | 13743 | .13808 | 48 | 12522 | .09767 | 93 | 11500 | .06070 |
| 4 | 13713 | .13714 | 49 | 12497 | .09682 | 94 | 11479 | .05992 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| 5 | 13684 | 7.13621 | 50 | 12473 | 7.09596 | 95 | 11458 | 7.05913 |
| 6 | 13654 | .13527 | 51 | 12448 | .09511 | 96 | 11438 | .05835 |
| 7 | 13625 | .13434 | 52 | 12424 | .09426 | 97 | 11418 | .05757 |
| 8 | 13596 | .13340 | 53 | 12400 | .09341 | 98 | 11397 | .05678 |
| 9 | 13567 | .13247 | 54 | 12375 | .09256 | 99 | 11376 | .05600 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| 10 | 13538 | 7.13155 | 55 | 12351 | 7.09171 | 100 | 11356 | 7.05523 |
| 11 | 13509 | .13062 | 56 | 12327 | .09087 | 101 | 11336 | .05445 |
| 12 | 13480 | .12970 | 57 | 12303 | .09002 | 102 | 11315 | .05367 |
| 13 | 13452 | .12877 | 58 | 12280 | .08918 | 103 | 11295 | .05290 |
| 14 | 13423 | .12785 | 59 | 12256 | .08834 | 104 | 11275 | .05213 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| 15 | 13395 | 7.12694 | 60 | 12232 | 7.08750 | 105 | 11255 | 7.05136 |
| 16 | 13367 | .12602 | 61 | 12209 | .08667 | 106 | 11235 | .05058 |
| 17 | 13338 | .12510 | 62 | 12185 | .08583 | 107 | 11215 | .04982 |
| 18 | 13310 | .12419 | 63 | 12162 | .08500 | 108 | 11196 | .04905 |
| 19 | 13282 | .12328 | 64 | 12138 | .08416 | 109 | 11176 | .04828 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| 20 | 13255 | 7.12237 | 65 | 12115 | 7.08334 | 110 | 11156 | 7.04752 |
| 21 | 13227 | .12147 | 66 | 12092 | .08251 | 112 | 11117 | .04599 |
| 22 | 13200 | .12056 | 67 | 12069 | .08168 | 114 | 11078 | .04447 |
| 23 | 13172 | .11966 | 68 | 12046 | .08085 | 116 | 11040 | .04296 |
| 24 | 13145 | .11876 | 69 | 12023 | .08003 | 118 | 11001 | .04145 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| 25 | 13118 | 7.11786 | 70 | 12001 | 7.07921 | 120 | 10963 | 7.03994 |
| 26 | 13091 | .11696 | 71 | 11978 | .07839 | 125 | 10870 | .03621 |
| 27 | 13064 | .11606 | 72 | 11956 | .07757 | 130 | 10776 | .03248 |
| 28 | 13037 | .11517 | 73 | 11933 | .07675 | 135 | 10686 | .02883 |
| 29 | 13010 | .11428 | 74 | 11910 | .07593 | 140 | 10597 | .02518 |

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Humidity term: Values of 0378 *e*. Auxiliary to Table 97.

*e* = Vapor pressure in inches. (See Tables 69 and 70.)

Temperature by normal hydrogen thermometer.

| Dew-Point. | *e* Vapor Pressure. (Ice.) | 0.378 *e* | Dew-Point. | Vapor Pressure. (*) | 0.378 *e* | Dew-Point. | Vapor Pressure. (Water.) | 0.378 *e* | Dew-Point. | Vapor Pressure. (Water.) | 0.378 *e* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| F. | Inch. | Inch. | F. | Inch. | Inch. | F. | Inch. | Inch. | F. | Inches. | Inches. |
| −60° | 0.0010 | 0.000 | −10° | 0.0223 | 0.008 | 40° | 0.2477 | 0.094 | 90° | 1.423 | 0.538 |
| 59 | .0011 | .000 | 9 | .0236 | .009 | 41 | .2575 | .097 | 91 | 1.469 | .555 |
| 58 | .0011 | .000 | 8 | .0249 | .009 | 42 | .2677 | .101 | 92 | 1.515 | .573 |
| 57 | .0012 | .000 | 7 | .0263 | .010 | 43 | .2782 | .106 | 93 | 1.563 | .591 |
| 56 | .0013 | .000 | 6 | .0277 | .010 | 44 | .2891 | .109 | 94 | 1.612 | .609 |
| −55 | 0.0014 | 0.001 | 5 | 0.0292 | 0.011 | 45 | 0.3003 | 0.114 | 95 | 1.662 | 0.628 |
| 54 | .0015 | .001 | 4 | .0308 | .012 | 46 | .3120 | .118 | 96 | 1.714 | .648 |
| 53 | .0016 | .001 | 3 | .0325 | .012 | 47 | .3240 | .122 | 97 | 1.767 | .668 |
| 52 | .0017 | .001 | 2 | .0343 | .013 | 48 | .3365 | .127 | 98 | 1.822 | .689 |
| 51 | .0018 | .001 | − 1 | .0361 | .014 | 49 | .3493 | .132 | 99 | 1.878 | .710 |
| −50 | 0.0020 | 0.001 | ± 0 | 0.0381 | 0.014 | 50 | 0.3626 | 0.137 | 100 | 1.936 | 0.732 |
| 49 | .0021 | .001 | + 1 | .0401 | .015 | 51 | .3763 | .142 | 101 | 1.994 | .754 |
| 48 | .0023 | .001 | 2 | .0423 | .016 | 52 | .3905 | .147 | 102 | 2.055 | .777 |
| 47 | .0024 | .001 | 3 | .0445 | .017 | 53 | .4052 | .153 | 103 | 2.117 | .800 |
| 46 | .0026 | .001 | 4 | .0468 | .018 | 54 | .4203 | .159 | 104 | 2.181 | .824 |
| −45 | 0.0028 | 0.001 | + 5 | 0.0493 | 0.019 | 55 | 0.4359 | 0.165 | 105 | 2.246 | 0.849 |
| 44 | .0029 | .001 | 6 | .0519 | .020 | 56 | .4521 | .171 | 106 | 2.314 | .875 |
| 43 | .0031 | .001 | 7 | .0546 | .021 | 57 | .4687 | .177 | 107 | 2.382 | .900 |
| 42 | .0033 | .001 | 8 | .0574 | .022 | 58 | .4859 | .184 | 108 | 2.453 | .927 |
| 41 | .0036 | .001 | 9 | .0604 | .023 | 59 | .5037 | .190 | 109 | 2.525 | .954 |
| −40 | 0.0038 | 0.001 | + 10 | 0.0635 | 0.024 | 60 | 0.5220 | 0.197 | 110 | 2.599 | 0.982 |
| 39 | .0040 | .002 | 11 | .0667 | .025 | 61 | .5409 | .204 | 111 | 2.676 | 1.012 |
| 38 | .0043 | .002 | 12 | .0701 | .027 | 62 | .5604 | .212 | 112 | 2.754 | 1.041 |
| 37 | .0046 | .002 | 13 | .0736 | .028 | 63 | .5805 | .219 | 113 | 2.833 | 1.071 |
| 36 | .0049 | .002 | 14 | .0773 | .029 | 64 | .6013 | .227 | 114 | 2.915 | 1.102 |
| −35 | 0.0052 | 0.002 | +15 | 0.0812 | 0.031 | 65 | 0.6226 | 0.235 | 115 | 2.999 | 1.134 |
| 34 | .0055 | .002 | 16 | .0852 | .032 | 66 | .6447 | .244 | 116 | 3.085 | 1.166 |
| 33 | .0059 | .002 | 17 | .0895 | .034 | 67 | .6674 | .252 | 117 | 3.173 | 1.199 |
| 32 | .0062 | .002 | 18 | .0939 | .035 | 68 | .6909 | .261 | 118 | 3.264 | 1.234 |
| 31 | .0066 | .003 | 19 | .0985 | .037 | 69 | .7150 | .270 | 119 | 3.356 | 1.269 |
| −30 | 0.0070 | 0.003 | +20 | 0.1033 | 0.039 | 70 | 0.7399 | 0.280 | 120 | 3.451 | 1.304 |
| 29 | .0075 | .003 | 21 | .1084 | .041 | 71 | .7655 | .289 | 121 | 3.548 | 1.341 |
| 28 | .0080 | .003 | 22 | .1136 | .043 | 72 | .7919 | .299 | 122 | 3.647 | 1.379 |
| 27 | .0084 | .003 | 23 | .1191 | .045 | 73 | .8191 | .310 | 123 | 3.749 | 1.417 |
| 26 | .0090 | .003 | 24 | .1248 | .047 | 74 | .8471 | .320 | 124 | 3.853 | 1.456 |
| −25 | 0.0095 | 0.004 | +25 | 0.1308 | 0.049 | 75 | 0.8760 | 0.331 | 125 | 3.960 | 1.497 |
| 24 | .0101 | .004 | 26 | .1370 | .052 | 76 | .9056 | .343 | 126 | 4.069 | 1.538 |
| 23 | .0107 | .004 | 27 | .1435 | .054 | 77 | .9362 | .354 | 127 | 4.180 | 1.580 |
| 22 | .0113 | .004 | 28 | .1502 | .057 | 78 | .9677 | .366 | 128 | 4.294 | 1.623 |
| 21 | .0120 | .005 | 29 | .1573 | .059 | 79 | 1.0001 | .378 | 129 | 4.412 | 1.668 |
| −20 | 0.0127 | 0.005 | +30 | 0.1646 | 0.062 | 80 | 1.0334 | 0.391 | 130 | 4.531 | 1.713 |
| 19 | .0135 | .005 | 31 | .1723 | .065 | 81 | 1.0676 | .404 | 131 | 4.654 | 1.759 |
| 18 | .0143 | .005 | 32 | .1803 | .068 | 82 | 1.1029 | .417 | 132 | 4.779 | 1.806 |
| 17 | .0151 | .006 | 33 | .1877 | .071 | 83 | 1.1392 | .431 | 133 | 4.907 | 1.855 |
| 16 | .0160 | .006 | 34 | .1954 | .074 | 84 | 1.1765 | .445 | 134 | 5.038 | 1.904 |
| −15 | 0.0169 | 0.006 | +35 | 0.2034 | 0.077 | 85 | 1.2149 | 0.459 | 135 | 5.172 | 1.955 |
| 14 | .0179 | .007 | 36 | .2117 | .080 | 86 | 1.2543 | .474 | 136 | 5.309 | 2.007 |
| 13 | .0189 | .007 | 37 | .2202 | .083 | 87 | 1.2949 | .489 | 137 | 5.449 | 2.060 |
| 12 | .0200 | .008 | 38 | .2291 | .087 | 88 | 1.3365 | .505 | 138 | 5.592 | 2.114 |
| 11 | .0211 | .008 | 39 | .2382 | .090 | 89 | 1.3794 | .521 | 139 | 5.739 | 2.169 |
| 10 | 0.0223 | 0.008 | 40 | 0.2477 | 0.094 | 90 | 1.4234 | 0.538 | 140 | 5.889 | 2.226 |

* Values for temperatures less than 32° F. refer to vapor over ice.

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Humidity and pressure terms combined: $\frac{\delta}{\delta_0} = \frac{h}{29.921} = \frac{B - 0.378e}{29.921}$.

$B$ = Barometric pressure in inches; $e$ = Vapor pressure in inches.

| h. | $\frac{h}{29.921}$. | Log $\frac{h}{29.921}$. | h. | $\frac{h}{29.291}$. | Log $\frac{h}{29.921}$. | h. | $\frac{h}{29.921}$. | Log $\frac{h}{29.921}$. |
|---|---|---|---|---|---|---|---|---|
| Inch's. | | — 10 | Inches. | | — 10 | Inches. | | — 10 |
| **10.0** | 0.3342 | 9.52402 | **15.0** | 0.5013 | 9.70012 | **20.0** | 0.6684 | 9.82505 |
| 10.1 | .3376 | .52835 | 15.1 | .5047 | .70300 | 20.1 | .6718 | .82722 |
| 10.2 | .3409 | .53262 | 15.2 | .5080 | .70587 | 20.2 | .6751 | .82938 |
| 10.3 | .3442 | .53686 | 15.3 | .5113 | .70871 | 20.3 | .6784 | .83152 |
| 10.4 | .3476 | .54106 | 15.4 | .5147 | .71154 | 20.4 | .6818 | .83365 |
| **10.5** | 0.3509 | 9.54521 | **15.5** | 0.5180 | 9.71435 | **20.5** | 0.6851 | 9.83578 |
| 10.6 | .3543 | .54933 | 15.6 | .5214 | .71715 | 20.6 | .6885 | .83789 |
| 10.7 | .3576 | .55341 | 15.7 | .5247 | .71992 | 20.7 | .6918 | .83999 |
| 10.8 | .3609 | .55745 | 15.8 | .5281 | .72268 | 20.8 | .6952 | .84209 |
| 10.9 | .3643 | .56145 | 15.9 | .5314 | .72542 | 20.9 | .6985 | .84417 |
| **11.0** | 0.3676 | 9.56542 | **16.0** | 0.5347 | 9.72814 | **21.0** | 0.7018 | 9.84624 |
| 11.1 | .3710 | .56935 | 16.1 | .5381 | .73085 | 21.1 | .7052 | .84831 |
| 11.2 | .3743 | .57324 | 16.2 | .5414 | .73354 | 21.2 | .7085 | .85036 |
| 11.3 | .3777 | .57710 | 16.3 | .5448 | .73621 | 21.3 | .7119 | .85240 |
| 11.4 | .3810 | .58093 | 16.4 | .5481 | .73887 | 21.4 | .7152 | .85444 |
| **11.5** | 0.3843 | 9.58472 | **16.5** | 0.5515 | 9.74151 | **21.5** | 0.7186 | 9.85646 |
| 11.6 | .3877 | .58848 | 16.6 | .5548 | .74413 | 21.6 | .7219 | .85848 |
| 11.7 | .3910 | .59221 | 16.7 | .5581 | .74674 | 21.7 | .7252 | .86048 |
| 11.8 | .3944 | .59591 | 16.8 | .5615 | .74933 | 21.8 | .7286 | .86248 |
| 11.9 | .3977 | .59957 | 16.9 | .5648 | .75191 | 21.9 | .7319 | .86447 |
| **12.0** | 0.4011 | 9.60321 | **17.0** | 0.5682 | 9.75447 | **22.0** | 0.7353 | 9.86645 |
| 12.1 | .4044 | .60681 | 17.1 | .5715 | .75702 | 22.1 | .7386 | .86842 |
| 12.2 | .4077 | .61038 | 17.2 | .5748 | .75955 | 22.2 | .7420 | .87038 |
| 12.3 | .4111 | .61393 | 17.3 | .5782 | .76207 | 22.3 | .7453 | .87233 |
| 12.4 | .4144 | .61745 | 17.4 | .5815 | .76457 | 22.4 | .7486 | .87427 |
| **12.5** | 0.4178 | 9.62093 | **17.5** | 0.5849 | 9.76706 | **22.5** | 0.7520 | 9.87621 |
| 12.6 | .4211 | .62439 | 17.6 | .5882 | .76954 | 22.6 | .7553 | .87813 |
| 12.7 | .4244 | .62782 | 17.7 | .5916 | .77200 | 22.7 | .7587 | .88005 |
| 12.8 | .4278 | .63123 | 17.8 | .5949 | .77444 | 22.8 | .7620 | .88196 |
| 12.9 | .4311 | .63461 | 17.9 | .5982 | .77687 | 22.9 | .7653 | .88386 |
| **13.0** | 0.4345 | 9.63797 | **18.0** | 0.6016 | 9.77930 | **23.0** | 0.7687 | 9.88575 |
| 13.1 | .4378 | .64130 | 18.1 | .6049 | .78170 | 23.1 | .7720 | .88764 |
| 13.2 | .4412 | .64460 | 18.2 | .6083 | .78410 | 23.2 | .7754 | .88951 |
| 13.3 | .4445 | .64788 | 18.3 | .6116 | .78648 | 23.3 | .7787 | .89138 |
| 13.4 | .4478 | .65113 | 18.4 | .6149 | .78884 | 23.4 | .7821 | .89324 |
| **13.5** | 0.4512 | 9.65436 | **18.5** | 0.6183 | 9.79120 | **23.5** | 0.7854 | 9.89509 |
| 13.6 | .4545 | .65756 | 18.6 | .6216 | .79354 | 23.6 | .7887 | .89693 |
| 13.7 | .4579 | .66074 | 18.7 | .6250 | .79587 | 23.7 | .7921 | .89877 |
| 13.8 | .4612 | .66390 | 18.8 | .6283 | .79818 | 23.8 | .7954 | .90060 |
| 13.9 | .4646 | .66704 | 18.9 | .6317 | .80049 | 23.9 | .7988 | .90242 |
| **14.0** | 0.4679 | 9.67015 | **19.0** | 0.6350 | 9.80278 | **24.0** | 0.8021 | 9.90424 |
| 14.1 | .4712 | .67324 | 19.1 | .6383 | .80506 | 24.1 | .8054 | .90604 |
| 14.2 | .4746 | .67631 | 19.2 | .6417 | .80733 | 24.2 | .8088 | .90784 |
| 14.3 | .4779 | .67936 | 19.3 | .6450 | .80958 | 24.3 | .8121 | .90963 |
| 14.4 | .4813 | .68239 | 19.4 | .6484 | .81183 | 24.4 | .8155 | .91141 |
| **14.5** | 0.4846 | 9.68539 | **19.5** | 0.6517 | 9.81406 | **24.5** | 0.8188 | 9.91319 |
| 14.6 | .4879 | .68837 | 19.6 | .6551 | .81628 | 24.6 | .8222 | .91496 |
| 14.7 | .4913 | .69134 | 19.7 | .6584 | .81849 | 24.7 | .8255 | .91672 |
| 14.8 | .4946 | .69429 | 19.8 | .6617 | .82069 | 24.8 | .8289 | .91848 |
| 14.9 | .4980 | .69721 | 19.9 | .6651 | .82288 | 24.9 | .8322 | .92022 |

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Humidity and pressure terms combined: $\frac{\delta}{\delta_0} = \frac{h}{29.921} = \frac{B - 0.378e}{29.921}$.

$B$ = Barometric pressure in inches; $e$ = Vapor pressure in inches.

| h. | $\frac{h}{29.921}$ | Log $\frac{h}{29.921}$ | h. | $\frac{h}{29.921}$ | Log $\frac{h}{29.921}$ | h. | $\frac{h}{29.921}$ | Log $\frac{h}{29.921}$ |
|---|---|---|---|---|---|---|---|---|
| Inches. | | − 10 | Inches. | | − 10 | Inches. | | − 10 |
| **25.00** | 0.8355 | 9.92196 | **27.25** | 0.9107 | 9.95939 | **29.50** | 0.9859 | 9.99385 |
| 25.05 | .8372 | .92283 | 27.30 | .9124 | .96019 | 29.55 | .9876 | .99458 |
| 25.10 | .8389 | .92370 | 27.35 | .9141 | .96098 | 29.60 | .9893 | .99532 |
| 25.15 | .8405 | .92456 | 27.40 | .9157 | .96177 | 29.65 | .9909 | .99605 |
| 25.20 | .8422 | .92542 | 27.45 | .9174 | .96256 | 29.70 | .9926 | .99678 |
| **25.25** | 0.8439 | 9.92628 | **27.50** | 0.9191 | 9.96336 | **29.75** | 0.9943 | 9.99751 |
| 25.30 | .8456 | .92714 | 27.55 | .9208 | .96414 | 29.80 | .9960 | .99824 |
| 25.35 | .8472 | .92800 | 27.60 | .9224 | .96493 | 29.85 | .9976 | .99897 |
| 25.40 | .8489 | .92886 | 27.65 | .9241 | .96572 | 29.90 | .9993 | .99970 |
| 25.45 | .8506 | .92971 | 27.70 | .9258 | .96650 | 29.95 | 1.0010 | 0.00042 |
| **25.50** | 0.8522 | 9.93056 | **27.75** | 0.9274 | 9.96728 | **30.00** | 1.0026 | 0.00115 |
| 25.55 | .8539 | .93141 | 27.80 | .9291 | .96807 | 30.05 | 1.0043 | .00187 |
| 25.60 | .8556 | .93226 | 27.85 | .9308 | .96885 | 30.10 | 1.0060 | .00259 |
| 25.65 | .8573 | .93311 | 27.90 | .9325 | .96963 | 30.15 | 1.0076 | .00331 |
| 25.70 | .8589 | .93396 | 27.95 | .9341 | .97040 | 30.20 | 1.0093 | .00403 |
| **25.75** | 0.8606 | 9.93480 | **28.00** | 0.9358 | 9.97118 | **30.25** | 1.0110 | 0.00475 |
| 25.80 | .8623 | .93564 | 28.05 | .9375 | .97195 | 30.30 | 1.0127 | .00547 |
| 25.85 | .8639 | .93648 | 28.10 | .9391 | .97273 | 30.35 | 1.0143 | .00618 |
| 25.90 | .8656 | .93732 | 28.15 | .9408 | .97350 | 30.40 | 1.0160 | .00690 |
| 25.95 | .8673 | .93816 | 28.20 | .9425 | .97427 | 30.45 | 1.0177 | .00761 |
| **26.00** | 0.8690 | 9.93900 | **28.25** | 0.9441 | 9.97504 | **30.50** | 1.0193 | 0.00832 |
| 26.05 | .8706 | .93983 | 28.30 | .9458 | .97581 | 30.55 | 1.0210 | .00903 |
| 26.10 | .8723 | .94066 | 28.35 | .9475 | .97657 | 30.60 | 1.0227 | .00975 |
| 26.15 | .8740 | .94149 | 28.40 | .9492 | .97734 | 30.65 | 1.0244 | .01045 |
| 26.20 | .8756 | .94233 | 28.45 | .9508 | .97810 | 30.70 | 1.0260 | .01116 |
| **26.25** | 0.8773 | 9.94315 | **28.50** | 0.9525 | 9.97887 | **30.75** | 1.0277 | 0.01187 |
| 26.30 | .8790 | .94398 | 28.55 | .9542 | .97963 | 30.80 | 1.0294 | .01257 |
| 26.35 | .8806 | .94480 | 28.60 | .9558 | .98039 | 30.85 | 1.0310 | .01328 |
| 26.40 | .8823 | .94563 | 28.65 | .9575 | .98115 | 30.90 | 1.0327 | .01398 |
| 26.45 | .8840 | .94645 | 28.70 | .9592 | .98191 | 30.95 | 1.0344 | .01468 |
| **26.50** | 0.8857 | 9.94727 | **28.75** | 0.9609 | 9.98266 | **31.00** | 1.0361 | 0.01539 |
| 26.55 | .8873 | .94809 | 28.80 | .9625 | .98342 | 31.05 | 1.0377 | .01608 |
| 26.60 | .8890 | .94891 | 28.85 | .9642 | .98417 | 31.10 | 1.0394 | .01678 |
| 26.65 | .8907 | .94972 | 28.90 | .9659 | .98492 | 31.15 | 1.0411 | .01748 |
| 26.70 | .8924 | .95054 | 28.95 | .9675 | .98567 | 31.20 | 1.0427 | .01818 |
| **26.75** | 0.8940 | 9.95135 | **29.00** | 0.9692 | 9.98642 | **31.25** | 1.0444 | 0.01887 |
| 26.80 | .8957 | .95216 | 29.05 | .9709 | .98717 | 31.30 | 1.0461 | .01957 |
| 26.85 | .8974 | .95297 | 29.10 | .9726 | .98792 | 31.35 | 1.0478 | .02026 |
| 26.90 | .8990 | .95378 | 29.15 | .9742 | .98866 | 31.40 | 1.0494 | .02095 |
| 26.95 | .9007 | .95458 | 29.20 | .9759 | .98941 | 31.45 | 1.0511 | .02164 |
| **27.00** | 0.9024 | 9.95539 | **29.25** | 0.9776 | 9.99015 | **31.50** | 1.0528 | 0.02233 |
| 27.05 | .9040 | .95619 | 29.30 | .9792 | .99089 | 31.55 | 1.0544 | .02302 |
| 27.10 | .9057 | .95699 | 29.35 | .9809 | .99163 | 31.60 | 1.0561 | .02371 |
| 27.15 | .9074 | .95779 | 29.40 | .9826 | .99237 | 31.65 | 1.0578 | .02439 |
| 27.20 | .9091 | .95859 | 29.45 | .9843 | .99311 | 31.70 | 1.0594 | .02508 |

TABLE 98.

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Temperature term: $\delta_{t,\,760} = \dfrac{0.00129305}{1 + 0.003670\,t}$. Centigrade temperature.

1 cubic centimeter of dry air at the temperature 0° C. and pressure 760 mm., under the standard value of gravity, weighs 0.00129305 gram.

| t. | $\delta_{t,\,760}$ | Log $\delta_{t,\,760}$ | t. | $\delta_{t,\,760}$ | Log $\delta_{t,\,760}$ | t. | $\delta_{t,\,760}$ | Log $\delta_{t,\,760}$ |
|---|---|---|---|---|---|---|---|---|
| C. | 0.00 | − 10 | C. | 0.00 | − 10 | C. | 0.00 | − 10 |
| −34° | 14774 | 7.16950 | − 4°.5 | 13148 | 7.11885 | 18°.0 | 12129 | 7.08383 |
| −33 | 14712 | .16768 | − 4.0 | 13123 | .11804 | 18.5 | 12108 | 8309 |
| −32 | 14651 | .16587 | − 3.5 | 13099 | .11723 | 19.0 | 12088 | 8234 |
| −31 | 14590 | .16407 | − 3.0 | 13074 | .11642 | 19.5 | 12067 | 8160 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −30 | 14530 | 7.16227 | − 2.5 | 13050 | 7.11562 | 20.0 | 12046 | 7.08085 |
| −29 | 14471 | .16049 | − 2.0 | 13026 | .11481 | 20.5 | 12026 | 8011 |
| −28 | 14412 | .15871 | − 1.5 | 13002 | .11401 | 21.0 | 12005 | 7937 |
| −27 | 14353 | .15693 | − 1.0 | 12978 | .11321 | 21.5 | 11985 | 7863 |
| −26 | 14295 | .15517 | − 0.5 | 12954 | .11241 | 22.0 | 11965 | 7789 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −25 | 14237 | 7.15341 | 0.0 | 12931 | 7.11162 | 22.5 | 11944 | 7.07716 |
| −24 | 14179 | .15166 | + 0.5 | 12907 | .11082 | 23.0 | 11924 | 7642 |
| −23 | 14123 | .14991 | 1.0 | 12884 | .11006 | 23.5 | 11904 | 7569 |
| −22 | 14066 | .14818 | 1.5 | 12860 | .10923 | 24.0 | 11884 | 7496 |
| −21 | 14010 | .14645 | 2.0 | 12836 | .10844 | 24.5 | 11864 | 7422 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −20.0 | 13955 | 7.14472 | 2.5 | 12813 | 7.10765 | 25.0 | 11844 | 7.07349 |
| −19.5 | 13927 | .14386 | 3.0 | 12790 | .10686 | 25.5 | 11824 | 7276 |
| −19.0 | 13900 | .14301 | 3.5 | 12766 | .10607 | 26.0 | 11804 | 7204 |
| −18.5 | 13872 | .14215 | 4.0 | 12744 | .10529 | 26.5 | 11784 | 7131 |
| −18.0 | 13845 | .14130 | 4.5 | 12720 | .10450 | 27.0 | 11765 | 7058 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −17.5 | 13818 | 7.14044 | 5.0 | 12698 | 7.10372 | 27.5 | 11745 | 7.06986 |
| −17.0 | 13791 | .13959 | 5.5 | 12675 | .10294 | 28.0 | 11726 | 6913 |
| −16.5 | 13764 | .13874 | 6.0 | 12652 | .10216 | 28.5 | 11706 | 6841 |
| −16.0 | 13737 | .13790 | 6.5 | 12629 | .10138 | 29.0 | 11687 | 6769 |
| −15.5 | 13710 | .13705 | 7.0 | 12607 | .10069 | 29.5 | 11667 | 6697 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −15.0 | 13684 | 7.13621 | 7.5 | 12584 | 7.09982 | 30.0 | 11648 | 7.06625 |
| −14.5 | 13657 | .13536 | 8.0 | 12562 | 9905 | 30.5 | 11629 | 6554 |
| −14.0 | 13631 | .13452 | 8.5 | 12539 | 9828 | 31.0 | 11610 | 6482 |
| −13.5 | 13604 | .13368 | 9.0 | 12517 | 9750 | 31.5 | 11591 | 6411 |
| −13.0 | 13578 | .13285 | 9.5 | 12495 | 9673 | 32.0 | 11572 | 6340 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −12.5 | 13552 | 7.13201 | 10.0 | 12473 | 7.09596 | 32.5 | 11553 | 7.06268 |
| −12.0 | 13526 | .13117 | 10.5 | 12451 | 9519 | 33.0 | 11534 | 6197 |
| −11.5 | 13500 | .13034 | 11.0 | 12429 | 9443 | 33.5 | 11515 | 6126 |
| −11.0 | 13473 | .12951 | 11.5 | 12407 | 9366 | 34.0 | 11496 | 6055 |
| −10.5 | 13449 | .12868 | 12.0 | 12385 | 9290 | 34.5 | 11477 | 5984 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| −10.0 | 13423 | 7.12785 | 12.5 | 12363 | 7.09214 | 35.0 | 11459 | 7.05913 |
| − 9.5 | 13398 | .12703 | 13.0 | 12342 | 9137 | 35.5 | 11440 | 5843 |
| − 9.0 | 13372 | .12620 | 13.5 | 12320 | 9061 | 36.0 | 11421 | 5772 |
| − 8.5 | 13347 | .12538 | 14.0 | 12299 | 8986 | 36.5 | 11403 | 5702 |
| − 8.0 | 13322 | .12456 | 14.5 | 12277 | 8910 | 37.0 | 11385 | 5632 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| − 7.5 | 13297 | 7.12374 | 15.0 | 12256 | 7.08834 | 37.5 | 11366 | 7.05562 |
| − 7.0 | 13271 | .12292 | 15.5 | 12235 | 8759 | 38.0 | 11348 | 5492 |
| − 6.5 | 13246 | .12210 | 16.0 | 12213 | 8683 | 38.5 | 11330 | 5422 |
| − 6.0 | 13222 | .12128 | 16.5 | 12192 | 8608 | 39.0 | 11311 | 5352 |
| − 5.5 | 13197 | .12047 | 17.0 | 12171 | 8533 | 39.5 | 11293 | 5282 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| − 5.0 | 13172 | 7.11966 | 17.5 | 12150 | 7.08458 | 40.0 | 11275 | 7.05213 |

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Temperature term. (*Continued.*)

| t. | $\delta_{t,760}$ | Log $\delta_{t,760}$ | t. | $\delta_{t,760}$ | Log $\delta_{t,760}$ | t. | $\delta_{t,760}$ | Log $\delta_{t,760}$ |
|---|---|---|---|---|---|---|---|---|
| C. | 0.00 | −10 | C. | 0.00 | −10 | C. | 0.00 | −10 |
| 40° | 11275 | 7.05213 | 50° | 10926 | 7.03845 | 60° | 10597 | 7.02518 |
| 41 | 11239 | .05074 | 51 | 10892 | .03710 | 61 | 10565 | .02388 |
| 42 | 11204 | .04936 | 52 | 10858 | .03576 | 62 | 10534 | .02258 |
| 43 | 11168 | .04798 | 53 | 10825 | .03443 | 63 | 10502 | .02128 |
| 44 | 11133 | .04660 | 54 | 10792 | .03309 | 64 | 10471 | .01999 |
| | 0.00 | | | 0.00 | | | 0.00 | |
| 45 | 11098 | 7.04523 | 55 | 10759 | 7.03177 | 65 | 10440 | 7.01870 |
| 46 | 11063 | .04387 | 56 | 10726 | .03044 | 66 | 10409 | .01742 |
| 47 | 11028 | .04251 | 57 | 10694 | .02912 | 67 | 10379 | .01614 |
| 48 | 10994 | .04115 | 58 | 10661 | .02780 | 68 | 10348 | .01486 |
| 49 | 10960 | .03980 | 59 | 10629 | .02649 | 69 | 10318 | .01358 |



Humidity term: Values of $0.378e$. Auxiliary to Table 100.
$e$ = Vapor pressure in mm. (See Tables 71 and 72.)

| Dew-point. | $e$ Vapor Pressure (Ice). | $0.378e$ | Dew-point. | $e$ Vapor Pressure (Water). | $0.378e$ | Dew-point. | $e$ Vapor Pressure (Water). | $0.378e$ |
|---|---|---|---|---|---|---|---|---|
| C. | mm. | mm. | C. | mm. | mm. | C. | mm. | mm. |
| −50 | 0.029 | 0.01 | 0° | 4.580 | 1.73 | 30° | 31.860 | 12.04 |
| −45 | 0.054 | 0.02 | 1 | 4.924 | 1.86 | 31 | 33.735 | 12.75 |
| −40 | 0.096 | 0.04 | 2 | 5.291 | 2.00 | 32 | 35.705 | 13.50 |
| −35 | 0.169 | 0.06 | 3 | 5.682 | 2.15 | 33 | 37.775 | 14.28 |
| −30 | 0.288 | 0.11 | 4 | 6.098 | 2.31 | 34 | 39.947 | 15.10 |
| −25 | 0.480 | 0.18 | 5 | 6.541 | 2.47 | 35 | 42.227 | 15.96 |
| 24 | 0.530 | 0.20 | 6 | 7.012 | 2.66 | 36 | 44.619 | 16.87 |
| 23 | 0.585 | 0.22 | 7 | 7.513 | 2.84 | 37 | 47.127 | 17.81 |
| 22 | 0.646 | 0.24 | 8 | 8.045 | 3.04 | 38 | 49.756 | 18.81 |
| 21 | 0.712 | 0.27 | 9 | 8.610 | 3.25 | 39 | 52.510 | 19.85 |
| −20 | 0.783 | 0.30 | 10 | 9.210 | 3.48 | 40 | 55.396 | 20.94 |
| 19 | 0.862 | 0.33 | 11 | 9.846 | 3.72 | 41 | 58.417 | 22.08 |
| 18 | 0.947 | 0.36 | 12 | 10.521 | 3.98 | 42 | 61.580 | 23.28 |
| 17 | 1.041 | 0.39 | 13 | 11.235 | 4.25 | 43 | 64.889 | 24.53 |
| 16 | 1.142 | 0.43 | 14 | 11.992 | 4.53 | 44 | 68.350 | 25.84 |
| −15 | 1.252 | 0.47 | 15 | 12.794 | 4.84 | 45 | 71.968 | 27.20 |
| 14 | 1.373 | 0.52 | 16 | 13.642 | 5.16 | 46 | 75.751 | 28.63 |
| 13 | 1.503 | 0.57 | 17 | 14.539 | 5.50 | 47 | 79.703 | 30.13 |
| 12 | 1.644 | 0.62 | 18 | 15.487 | 5.85 | 48 | 83.830 | 31.69 |
| 11 | 1.798 | 0.68 | 19 | 16.489 | 6.23 | 49 | 88.140 | 33.32 |
| −10 | 1.964 | 0.74 | 20 | 17.548 | 6.63 | 50 | 92.64 | 35.02 |
| 9 | 2.144 | 0.81 | 21 | 18.665 | 7.06 | 51 | 97.33 | 36.79 |
| 8 | 2.340 | 0.88 | 22 | 19.844 | 7.50 | 52 | 102.23 | 38.64 |
| 7 | 2.550 | 0.96 | 23 | 21.087 | 7.97 | 53 | 107.33 | 40.57 |
| 6 | 2.778 | 1.05 | 24 | 22.398 | 8.47 | 54 | 112.66 | 42.59 |
| −5 | 3.025 | 1.14 | 25 | 23.780 | 8.99 | 55 | 118.20 | 44.68 |
| 4 | 3.291 | 1.24 | 26 | 25.235 | 9.54 | 56 | 123.98 | 46.86 |
| 3 | 3.578 | 1.35 | 27 | 26.767 | 10.12 | 57 | 130.00 | 49.14 |
| 2 | 3.887 | 1.47 | 28 | 28.380 | 10.73 | 58 | 136.26 | 51.51 |
| 1 | 4.220 | 1.60 | 29 | 30.076 | 11.37 | 59 | 142.78 | 53.97 |
| 0 | 4.580 | 1.73 | 30 | 31.860 | 12.04 | 60 | 149.57 | 56.54 |

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Humidity and pressure terms combined : $\frac{\delta}{\delta_0} = \frac{h}{760} = \frac{B-0.378e}{760}$.

$B$ = Barometric pressure in mm. ; $e$ = Vapor pressure in mm.

| h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. | h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. | h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. |
|---|---|---|---|---|---|---|---|---|
| mm. | | − 10 | mm. | | − 10 | mm. | | − 10 |
| **300** | 0.3947 | 9.59631 | **400** | 0.5263 | 9.72125 | **450** | 0.5921 | 9.77240 |
| 302 | .3974 | .59919 | 401 | .5276 | .72233 | 451 | .5934 | .77336 |
| 304 | .4000 | .60206 | 402 | .5289 | .72341 | 452 | .5947 | .77432 |
| 306 | .4026 | .60491 | 403 | .5303 | .72449 | 453 | .5961 | .77528 |
| 308 | .4053 | .60774 | 404 | .5316 | .72557 | 454 | .5974 | .77624 |
| **310** | 0.4079 | 9.61055 | **405** | 0.5329 | 9.72664 | **455** | 0.5987 | 9.77720 |
| 312 | .4105 | .61334 | 406 | .5342 | .72771 | 456 | .6000 | .77815 |
| 314 | .4132 | .61612 | 407 | .5355 | .72878 | 457 | .6013 | .77910 |
| 316 | .4158 | .61887 | 408 | .5369 | .72985 | 458 | .6026 | .78005 |
| 318 | .4184 | .62161 | 409 | .5382 | .73091 | 459 | .6040 | .78100 |
| **320** | 0.4211 | 9.62434 | **410** | 0.5395 | 9.73197 | **460** | 0.6053 | 9.78194 |
| 322 | .4237 | .62704 | 411 | .5408 | .73303 | 461 | .6066 | .78289 |
| 324 | .4263 | .62973 | 412 | .5421 | .73408 | 462 | .6079 | .78383 |
| 326 | .4289 | .63240 | 413 | .5434 | .73514 | 463 | .6092 | .78477 |
| 328 | .4316 | .63506 | 414 | .5447 | .73619 | 464 | .6105 | .78570 |
| **330** | 0.4342 | 9.63770 | **415** | 0.5461 | 9.73723 | **465** | 0.6118 | 9.78664 |
| 332 | .4368 | .64032 | 416 | .5474 | .73828 | 466 | .6132 | .78757 |
| 334 | .4395 | .64293 | 417 | .5487 | .73932 | 467 | .6145 | .78850 |
| 336 | .4421 | .64552 | 418 | .5500 | .74036 | 468 | .6158 | .78943 |
| 338 | .4447 | .64810 | 419 | .5513 | .74140 | 469 | .6171 | .79036 |
| **340** | 0.4474 | 9.65066 | **420** | 0.5526 | 9.74244 | **470** | 0.6184 | 9.79128 |
| 342 | .4500 | .65321 | 421 | .5540 | .74347 | 471 | .6197 | .79221 |
| 344 | .4526 | .65574 | 422 | .5553 | .74450 | 472 | .6210 | .79313 |
| 346 | .4553 | .65826 | 423 | .5566 | .74553 | 473 | .6224 | .79405 |
| 348 | .4579 | .66076 | 424 | .5579 | .74655 | 474 | .6237 | .79496 |
| **350** | 0.4605 | 9.66325 | **425** | 0.5592 | 9.74758 | **475** | 0.6250 | 9.79588 |
| 352 | .4632 | .66573 | 426 | .5605 | .74860 | 476 | .6263 | .79679 |
| 354 | .4658 | .66819 | 427 | .5618 | .74961 | 477 | .6276 | .79770 |
| 356 | .4684 | .67064 | 428 | .5632 | .75063 | 478 | .6289 | .79861 |
| 358 | .4711 | .67307 | 429 | .5645 | .75164 | 479 | .6303 | .79952 |
| **360** | 0.4737 | 9.67549 | **430** | 0.5658 | 9.75265 | **480** | 0.6316 | 9.80043 |
| 362 | .4763 | .67790 | 431 | .5671 | .75366 | 481 | .6329 | .80133 |
| 364 | .4789 | .68029 | 432 | .5684 | .75467 | 482 | .6342 | .80223 |
| 366 | .4816 | .68267 | 433 | .5697 | .75567 | 483 | .6355 | .80313 |
| 368 | .4842 | .68503 | 434 | .5711 | .75668 | 484 | .6368 | .80403 |
| **370** | 0.4868 | 9.68739 | **435** | 0.5724 | 9.75768 | **485** | 0.6382 | 9.80493 |
| 372 | .4895 | .68973 | 436 | .5737 | .75867 | 486 | .6395 | .80582 |
| 374 | .4921 | .69206 | 437 | .5750 | .75967 | 487 | .6408 | .80672 |
| 376 | .4947 | .69437 | 438 | .5763 | .76066 | 488 | .6421 | .80761 |
| 378 | .4974 | .69668 | 439 | .5776 | .76165 | 489 | .6434 | .80850 |
| **380** | 0.5000 | 9.69897 | **440** | 0.5790 | 9.76264 | **490** | 0.6447 | 9.80938 |
| 382 | .5026 | .70125 | 441 | .5803 | .76362 | 491 | .6461 | .81027 |
| 384 | .5053 | .70352 | 442 | .5816 | .76461 | 492 | .6474 | .81115 |
| 386 | .5079 | .70577 | 443 | .5829 | .76559 | 493 | .6487 | .81203 |
| 388 | .5105 | .70802 | 444 | .5842 | .76657 | 494 | .6500 | .81291 |
| **390** | 0.5132 | 9.71025 | **445** | 0.5855 | 9.76755 | **495** | 0.6513 | 9.81379 |
| 392 | .5158 | .71247 | 446 | .5868 | .76852 | 496 | .6526 | .81467 |
| 394 | .5184 | .71468 | 447 | .5882 | .76949 | 497 | .6540 | .81556 |
| 396 | .5211 | .71688 | 448 | .5895 | .77046 | 498 | .6553 | .81642 |
| 398 | .5237 | .71907 | 449 | .5908 | .77143 | 499 | .6566 | .81729 |

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Humidity and pressure terms combined : $\frac{\delta}{\delta_0} = \frac{h}{760} = \frac{B - 0.378e}{760}$.

$B$ = Barometric pressure in mm. ; $e$ = Vapor pressure in mm.

| h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. | h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. | h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. |
|---|---|---|---|---|---|---|---|---|
| mm. | | — 10 | mm. | | — 10 | mm. | | — 10 |
| **500** | 0.6579 | 9.81816 | **550** | 0.7237 | 9.85955 | **600** | 0.7895 | 9.89734 |
| 501 | .6592 | .81902 | 551 | .7250 | .86034 | 601 | .7908 | .89806 |
| 502 | .6605 | .81989 | 552 | .7263 | .86112 | 602 | .7921 | .89878 |
| 503 | .6618 | .82075 | 553 | .7276 | .86191 | 603 | .7934 | .89950 |
| 504 | .6632 | .82162 | 554 | .7290 | .86270 | 604 | .7947 | .90022 |
| **505** | 0.6645 | 9.82248 | **555** | 0.7303 | 9.86348 | **605** | 0.7961 | 9.90094 |
| 506 | .6658 | .82334 | 556 | .7316 | .86426 | 606 | .7974 | .90166 |
| 507 | .6671 | .82419 | 557 | .7329 | .86504 | 607 | .7987 | .90238 |
| 508 | .6684 | .82505 | 558 | .7342 | .86582 | 608 | .8000 | .90309 |
| 509 | .6697 | .82590 | 559 | .7355 | .86660 | 609 | .8013 | .90380 |
| **510** | 0.6711 | 9.82676 | **560** | 0.7368 | 9.86737 | **610** | 0.8026 | 9.90452 |
| 511 | .6724 | .82761 | 561 | .7382 | .86815 | 611 | .8040 | .90523 |
| 512 | .6737 | .82846 | 562 | .7395 | .86892 | 612 | .8053 | .90594 |
| 513 | .6750 | .82930 | 563 | .7408 | .86969 | 613 | .8066 | .90665 |
| 514 | .6763 | .83015 | 564 | .7421 | .87046 | 614 | .8079 | .90735 |
| **515** | 0.6776 | 9.83099 | **565** | 0.7434 | 9.87123 | **615** | 0.8092 | 9.90806 |
| 516 | .6789 | .83184 | 566 | .7447 | .87200 | 616 | .8105 | .90877 |
| 517 | .6803 | .83268 | 567 | .7461 | .87277 | 617 | .8118 | .90947 |
| 518 | .6816 | .83352 | 568 | .7474 | .87353 | 618 | .8132 | .91017 |
| 519 | .6829 | .83435 | 569 | .7487 | .87430 | 619 | .8145 | .91088 |
| **520** | 0.6842 | 9.83519 | **570** | 0.7500 | 9.87506 | **620** | 0.8158 | 9.91158 |
| 521 | .6855 | .83602 | 571 | .7513 | .87582 | 621 | .8171 | .91228 |
| 522 | .6869 | .83686 | 572 | .7526 | .87658 | 622 | .8184 | .91298 |
| 523 | .6882 | .83769 | 573 | .7540 | .87734 | 623 | .8197 | .91367 |
| 524 | .6895 | .83852 | 574 | .7553 | .87810 | 624 | .8211 | .91437 |
| **525** | 0.6908 | 9.83934 | **575** | 0.7566 | 9.87885 | **625** | 0.8224 | 9.91507 |
| 526 | .6921 | .84017 | 576 | .7579 | .87961 | 626 | .8237 | .91576 |
| 527 | .6934 | .84100 | 577 | .7592 | .88036 | 627 | .8250 | .91645 |
| 528 | .6947 | .84182 | 578 | .7605 | .88111 | 628 | .8263 | .91715 |
| 529 | .6961 | .84264 | 579 | .7618 | .88186 | 629 | .8276 | .91784 |
| **530** | 0.6974 | 9.84346 | **580** | 0.7632 | 9.88261 | **630** | 0.8289 | 9.91853 |
| 531 | .6987 | .84428 | 581 | .7645 | .88336 | 631 | .8303 | .91922 |
| 532 | .7000 | .84510 | 582 | .7658 | .88411 | 632 | .8316 | .91990 |
| 533 | .7013 | .84591 | 583 | .7671 | .88486 | 633 | .8329 | .92059 |
| 534 | .7026 | .84673 | 584 | .7684 | .88560 | 634 | .8342 | .92128 |
| **535** | 0.7040 | 9.84754 | **585** | 0.7697 | 9.88634 | **635** | 0.8355 | 9.92196 |
| 536 | .7053 | .84835 | 586 | .7711 | .88708 | 636 | .8368 | .92264 |
| 537 | .7066 | .84916 | 587 | .7724 | .88782 | 637 | .8382 | .92332 |
| 538 | .7079 | .84997 | 588 | .7737 | .88856 | 638 | .8395 | .92401 |
| 539 | .7092 | .85078 | 589 | .7750 | .88930 | 639 | .8408 | .92469 |
| **540** | 0.7105 | 9.85158 | **590** | 0.7763 | 9.89004 | **640** | 0.8421 | 9.92537 |
| 541 | .7118 | .85238 | 591 | .7776 | .89077 | 641 | .8434 | .92604 |
| 542 | .7132 | .85318 | 592 | .7789 | .89151 | 642 | .8447 | .92672 |
| 543 | .7145 | .85399 | 593 | .7803 | .89224 | 643 | .8461 | .92740 |
| 544 | .7158 | .85478 | 594 | .7816 | .89297 | 644 | .8474 | .92807 |
| **545** | 0.7171 | 9.85558 | **595** | 0.7829 | 9.89370 | **645** | 0.8487 | 9.92875 |
| 546 | .7184 | .85638 | 596 | .7842 | .89443 | 646 | .8500 | .92942 |
| 547 | .7197 | .85717 | 597 | .7855 | .89516 | 647 | .8513 | .93009 |
| 548 | .7211 | .85797 | 598 | .7868 | .89589 | 648 | .8526 | .93076 |
| 549 | .7224 | .85876 | 599 | .7882 | .89662 | 649 | .8539 | .93143 |

## WEIGHT IN GRAMS OF ONE CUBIC CENTIMETER OF AIR.

Humidity and pressure terms combined : $\frac{\delta}{\delta_0} = \frac{h}{760} = \frac{B - 0.378e}{760}$.

$B$ = Barometric pressure in mm. ; $e$ = Vapor pressure in mm.

| h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. | h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. | h. | $\frac{h}{760}$. | Log $\frac{h}{760}$. |
|---|---|---|---|---|---|---|---|---|
| mm. | | − 10 | mm. | | − 10 | mm. | | − 10 |
| **650** | 0.8553 | 9.93210 | **700** | 0.9211 | 9.96428 | **750** | 0.9868 | 9.99425 |
| 651 | .8566 | .93277 | 701 | .9224 | .96490 | 751 | .9882 | .99483 |
| 652 | .8579 | .93341 | 702 | .9237 | .96552 | 752 | .9895 | .99540 |
| 653 | .8592 | .93410 | 703 | .9250 | .96614 | 753 | .9908 | .99598 |
| 654 | .8605 | .93476 | 704 | .9263 | .96676 | 754 | .9921 | .99656 |
| **655** | 0.8618 | 9.93543 | **705** | 0.9276 | 9.96738 | **755** | 0.9934 | 9.99713 |
| 656 | .8632 | .93609 | 706 | .9289 | .96799 | 756 | .9947 | .99771 |
| 657 | .8645 | .93675 | 707 | .9303 | .96860 | 757 | .9961 | .99828 |
| 658 | .8658 | .93741 | 708 | .9316 | .96922 | 758 | .9974 | .99886 |
| 659 | .8671 | .93807 | 709 | .9329 | .96983 | 759 | .9987 | .99943 |
| **660** | 0.8684 | 9.93873 | **710** | 0.9342 | 9.97044 | **760** | 1.0000 | 0.00000 |
| 661 | .8697 | .93939 | 711 | .9355 | .97106 | 761 | .0013 | .00057 |
| 662 | .8711 | .94004 | 712 | .9368 | .97167 | 762 | .0026 | .00114 |
| 663 | .8724 | .94070 | 713 | .9382 | .97228 | 763 | .0039 | .00171 |
| 664 | .8737 | .94135 | 714 | .9395 | .97288 | 764 | .0053 | .00228 |
| **665** | 0.8750 | 9.94201 | **715** | 0.9408 | 9.97349 | **765** | 1.0066 | 0.00285 |
| 666 | .8763 | .94266 | 716 | .9421 | .97410 | 766 | .0079 | .00342 |
| 667 | .8776 | .94331 | 717 | .9434 | .97470 | 767 | .0092 | .00398 |
| 668 | .8790 | .94396 | 718 | .9447 | .97531 | 768 | .0105 | .00455 |
| 669 | .8803 | .94461 | 719 | .9461 | .97592 | 769 | .0118 | .00511 |
| **670** | 0.8816 | 9.94526 | **720** | 0.9474 | 9.97652 | **770** | 1.0132 | 0.00568 |
| 671 | .8829 | .94591 | 721 | .9487 | .97712 | 771 | .0145 | .00624 |
| 672 | .8842 | .94656 | 722 | .9500 | .97772 | 772 | .0158 | .00680 |
| 673 | .8855 | .94720 | 723 | .9513 | .97832 | 773 | .0171 | .00736 |
| 674 | .8869 | .94785 | 724 | .9526 | .97892 | 774 | .0184 | .00793 |
| **675** | 0.8882 | 9.94849 | **725** | 0.9539 | 9.97952 | **775** | 1.0197 | 0.00849 |
| 676 | .8895 | .94913 | 726 | .9553 | .98012 | 776 | .0211 | .00905 |
| 677 | .8908 | .94978 | 727 | .9566 | .98072 | 777 | .0224 | .00961 |
| 678 | .8921 | .95042 | 728 | .9579 | .98132 | 778 | .0237 | .01017 |
| 679 | .8934 | .95106 | 729 | .9592 | .98191 | 779 | .0250 | .01072 |
| **680** | 0.8947 | 9.95170 | **730** | 0.9605 | 9.98250 | **780** | 1.0263 | 0.01128 |
| 681 | .8960 | .95233 | 731 | .9618 | .98310 | 781 | .0276 | .01184 |
| 682 | .8974 | .95297 | 732 | .9632 | .98370 | 782 | .0289 | .01239 |
| 683 | .8987 | .95361 | 733 | .9645 | .98429 | 783 | .0303 | .01295 |
| 684 | .9000 | .95424 | 734 | .9658 | .98488 | 784 | .0316 | .01350 |
| **685** | 0.9013 | 9.95488 | **735** | 0.9671 | 9.98547 | **785** | 1.0329 | 0.01406 |
| 686 | .9026 | .95551 | 736 | .9684 | .98606 | 786 | .0342 | .01461 |
| 687 | .9039 | .95614 | 737 | .9697 | .98665 | 787 | .0355 | .01516 |
| 688 | .9053 | .95677 | 738 | .9711 | .98724 | 788 | .0368 | .01571 |
| 689 | .9066 | .95740 | 739 | .9724 | .98783 | 789 | .0382 | .01626 |
| **690** | 0.9079 | 9.95804 | **740** | 0.9737 | 9.98842 | **790** | 1.0395 | 0.01681 |
| 691 | .9092 | .95866 | 741 | .9750 | .98900 | 791 | .0408 | .01736 |
| 692 | .9105 | .95929 | 742 | .9763 | .98959 | 792 | .0421 | .01791 |
| 693 | .9118 | .95992 | 743 | .9776 | .99018 | 793 | .0434 | .01846 |
| 694 | .9132 | .96054 | 744 | .9789 | .99076 | 794 | .0447 | .01901 |
| **695** | 0.9145 | 9.96117 | **745** | 0.9803 | 9.99134 | **795** | 1.0461 | 0.01955 |
| 696 | .9158 | .96180 | 746 | .9816 | .99192 | 796 | .0474 | .02010 |
| 697 | .9171 | .96242 | 747 | .9829 | .99251 | 797 | .0487 | .02064 |
| 698 | .9184 | .96304 | 748 | .9842 | .99309 | 798 | .0500 | .02119 |
| 699 | .9197 | .96366 | 749 | .9855 | .99367 | 799 | .0513 | .02173 |

## ATMOSPHERIC WATER-VAPOR LINES IN THE VISIBLE SPECTRUM.

| Wave lengths in Ångströms. | Number of lines. | Intensity. |
|---|---|---|
| 5292.3–5296.0 | 4? | 00 |
| 5861.8–5870.0 | 7 | 00 |
| 5870.864 | | 1 |
| 5871.3–5876.0 | 8 | 00 |
| 5876.338 | | 1 |
| 5876.6–5879.4 | 4 | 00 |
| 5879.820 | | 1 |
| 5879.945 | | 1 |
| 5880.7–5881.0 | 2 | 0 |
| 5881.147 | | 1 |
| 5881.320 | | 0 |
| 5882.084 | | 1 |
| 5882.2–5883.2 | 3 | 0 |
| 5884.120 | | 5 |
| 5884.4–5885.8 | 3 | 00 |
| 5886.193 | | 5 |
| 5886.560 | | 1 |
| 5886.6–5886.9 | 2 | 0 |
| 5887.445 | | 5 |
| 5887.880 | | 3 |
| 5888.056 | | 00 |
| 5888.920 | | 2 |
| 5889.303 | | 00 |
| 5889.855 | | 3 |
| 5890.100 | | 2 |
| 5890.4–5890.9 | 2 | 00 |
| 5891.398 | | 1 |
| 5891.720 | | 0 |
| 5891.878 | | 4 |
| 5892.608 | | 3 |
| 5893.268 | | 0 |
| 5893.725 | | 1 |
| 5894.6–5896.6 | 5 | 0 |
| 5896.710 | | 1 |
| 5897.047 | | 2 |
| 5897.3–5898.2 | 4 | 00 |
| 5898.378 | | 4 |
| 5898.6–5899.0 | 2 | 00 |
| 5899.215 | | 2 |
| 5899.752 | | 00 |
| 5900.135 | | 2 |
| 5900.260 | | 4 |
| 5900.6–5901.5 | 3 | 00 |
| 5901.682 | | 6 |
| 5902.238 | | 000 |
| 5902.363 | | 1 |
| 5903.035 | | 000 |
| 5903.748 | | 1 |
| 5903.9–5907.7 | 13 | 00 |
| 5908.070 | | 1 |
| 5908.425 | | 1 |
| 5909.213 | | 3 |
| 5909.668 | | 00 |
| 5910.398 | | 1 |
| 5910.5–5910.9 | 3 | 00 |
| 5910.987 | | 2 |
| 5911.1–5912.9 | 7 | 00 |
| 5913.212 | | 3 |
| 5914.430 | | 6 |
| 5915.146 | | 1 |
| 5915.650 | | 1 |
| 5915.840 | | 1 |
| 5916.0–5918.2 | 6 | 00 |
| 5918.635 | | 4 |
| 5919.175 | | 000 |
| 5919.276 | | 5 |
| 5919.860 | | 7 |
| 5920.395 | | 00 |
| 5920.776 | | 1 |
| 5921.3–5922.6 | 3 | 0 |
| 5922.735 | | 2 |
| 5922.9–5923.4 | 2 | 0 |
| 5923.865 | | 1 |
| 5924.040 | | 2 |
| 5924.490 | | 4 |
| 5924.975 | | 000 |
| 5925.220 | | 2 |
| 5926.835 | | 000 |
| 5928.510 | | 2 |
| 5929.0–5931.2 | 5 | 00 |
| 5932.306 | | 5 |
| 5932.998 | | 2 |
| 5933.2–5940.2 | 14 | 000 |
| 5940.640 | | 1 |
| 5941.091 | | 00 |
| 5941.290 | | 5 |
| 5941.470 | | 000 |
| 5941.845 | | 2 |
| 5942.500 | | 000 |
| 5942.635 | | 1 |
| 5942.789 | | 3 |
| 5944.530 | | 1 |
| 5944.945 | | 1 |
| 5945.4–5945.5 | 2 | 00 |
| 5945.865 | | 1 |
| 5946.223 | | 3 |
| 5946.864 | | 000 |
| 5947.062 | | 1 |
| 5947.283 | | 2 |
| 5947.6–5949.2 | 4 | 000 |
| 5949.390 | | 2 |
| 5949.8–5954.6 | 11 | 00 |
| 5955.170 | | 1 |
| 5956.0–5956.6 | 4 | 000 |
| 5958.098 | | 1 |
| 5958.460 | | 1 |
| 5961.6–5966.6 | 5 | 00 |
| 5966.885 | | 1 |
| 5967.540 | | 00 |
| 5968.058 | | 2 |
| 5968.280 | | 000 |
| 5968.495 | | 2 |
| 5969.2–5970.9 | 3 | 00 |
| 5971.557 | | 1 |
| 5975.330 | | 1 |
| 5976.694 | | 00 |
| 5977.252 | | 1 |
| 5977.6–6479.7 | 73 | 000 |

## Table 101.

### ATMOSPHERIC WATER-VAPOR LINES IN THE VISIBLE SPECTRUM.

| Wave lengths in Ångströms. | Number of lines. | Intensity. | Wave lengths in Ångströms. | Number of lines. | Intensity. |
|---|---|---|---|---|---|
| 6480.285 | | 1 | 6941.260 | | 000 |
| 6480.4–6483.3 | 4 | 0000 | 6941.475 | | 1 |
| 6483.468 | | 1 | 6942.402 | | 2 |
| 6483.6–6490.9 | 11 | 000 | 6942.630 | | 1 |
| 6491.015 | | 1 | 6944.060 | | 3 |
| 6493.1–6493.5 | 2 | 00 | 6947.782 | | 5 |
| 6494.725 | | 1 | 6947.863 | | 00 |
| 6496.082 | | 2 | 6949.240 | | 1 |
| 6497.8–6514.5 | 7 | 00 | 6949.310 | | 1 |
| 6514.956 | | 2 | 6951.010 | | 1 |
| 6516.080 | | 000 | 6953.828 | | 1 |
| 6516.750 | | 1 | 6954.0–6955.9 | 2 | 00 |
| 6516.855 | | 2 | 6956.660 } | | 4 |
| 6517.3–6519.4 | 3 | 00 | 6956.746 } | | 1 |
| 6519.682 | | 1 | 6959.704 | | 3 |
| 6522.1–6523.9 | 4 | 0000 | 6961.515 | | 4 |
| 6524.080 | | 1 | 6964.812 | | 1 |
| 6526.0–6530.8 | 2 | 000 | 6971.135 | | 0 |
| 6532.595 | | 1 | 6977.715 | | 3 |
| 6534.172 | | 2 | 6981.722 | | 1 |
| 6534.8–6542.6 | 3 | 000 | 6985.220 | | 0 |
| 6544.140 | | 2 | 6986.833 | | 3 |
| 6546.0–6547.9 | 2 | 00 | 6988.125 | | 0 |
| 6548.855 | | 1 | 6989.237 | | 3 |
| 6552.865 | | 1 | 6990.632 | | 1 |
| 6554.025 | | 00 ? | 6993.776 | | 2 |
| 6556.308 | | 1 | 6994.360 | | 1 |
| 6557.4–6558.4 | 2 | 0 | 6998.978 | | 0 |
| 6560.800 | | 1 ? | 6999.223 | | 2 |
| 6563.7–6569.0 | 4 | 00 | 7004.575 | | 0 |
| 6572.330 | | 1 | 7004.995 | | 2 |
| 6575.085 | | 1 | 7005.3–7010.1. | 2 | 0 |
| 6580.4–6929.6 | 11 | 000 | 7011.590 | | 2 |
| 6934.075 | | 2 | 7016.330 | | 1 |
| 6937.957 | | 2 | 7016.675 | | 3 |
| 6938.520 | | 1 | 7023.770 | | 2 |
| 6939.875 | | 2 | 7027.213 | | 0 |
| 6940.436 | | 2 | 7027.740 | | 2 |

## Table 102.

### ATMOSPHERIC WATER-VAPOR BANDS IN THE INFRA-RED SPECTRUM.

| Name of band. | Wave-lengths. | Transmission coefficient $a$. |
|---|---|---|
| | $\mu$ | |
| $\alpha$ | 0.718 | 0.91 |
| | 0.814 | 0.92 |
| | 0.896 | 0.90 |
| $\rho$ | 0.933 | 0.63 |
| $\sigma$ | 0.945 | 0.69 |
| $\tau$ | 0.974 | 0.91 |
| $\Phi_1$ | 1.119 | 0.54 |
| $\Phi_2$ | 1.134 | 0.60 |
| | 1.172 | 0.92 |
| In $\Psi$ | 1.331 | 0.74 |
| In $\Psi$ | 1.451 | 0.36 |
| $\Psi_1$ | 1.469 | 0.55 |

The infra-red bands may perhaps be composed of numerous fine lines which the bolographic apparatus does not separately distinguish.

Wide bands of very great atmospheric water-vapor absorption are found in the infra-red spectrum as follows:

| Name. | Wave lengths. | Absorption at Washington. |
|---|---|---|
| | $\mu$ $\mu$ | |
| $\rho\sigma\tau$ | 0.926–0.978 | 0.3 to 0.5 |
| $\Phi$ | 1.095–1.165 | 0.5 to 0.8 |
| $\Psi$ | 1.319–1.498 | 0.7 to 1.0 |
| $\Omega$ | 1.762–1.977 | 0.9 to 1.0 |
| X | 2.520–2.845 | 1.0 { Partly $CO_2$ } |

See Vol. I, *Annals Astrophysical Observatory*, Smithsonian Institution.

## TRANSMISSION PERCENTAGES OF RADIATION THROUGH MOIST AIR.

| Range of Wave-lengths. | | PRECIPITABLE WATER IN CENTIMETERS. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| μ | μ | .001 | .003 | .006 | .01 | .03 | .06 | .10 | .25 | .50 | 1.0 | 2.0 | 6.0 | 10.0 |
| 0.75 to | 1.0 | | | | 100 | 99 | 99 | 98 | 97 | 95 | 93 | 90 | 83 | 78 |
| 1.0 | 1.25 | | | | 99 | 99 | 98 | 97 | 95 | 92 | 89 | 85 | 74 | 69 |
| 1.25 | 1.5 | | | | 96 | 92 | 84 | 80 | 66 | 57 | 51 | 44 | 31 | 28 |
| 1.5 | 2.0 | | | | 98 | 97 | 94 | 88 | 79 | 73 | 70 | 66 | 60 | 57 |
| * 2. | 3. | 96 | 92 | 87 | 84 | 77 | 70 | 64 | | | | | | |
| 3. | 4. | 95 | 88 | 84 | 78 | 72 | 66 | 63 | | | | | | |
| * 4. | 5. | 92 | 83 | 76 | 71 | 65 | 60 | 53 | | | | | | |
| 5. | 6. | 95 | 82 | 75 | 68 | 56 | 51 | 47 | 35 | | | | | |
| 6. | 7. | 85 | 54 | 50 | 31 | 24 | 8 | 4 | 3 | 2 | 0 | 0 | 0 | 0 |
| 7. | 8. | 94 | 84 | 76 | 68 | 57 | 46 | 35 | 16 | 10 | 2 | 0 | 0 | 0 |
| 8. | 9. | 100 | 100 | 100 | 99 | 98 | 96 | 94 | 65 | | | | | |
| † 9. | 10. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | |
| †10. | 11. | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | | |
| 11. | 12. | 100 | 100 | 100 | 100 | 100 | 99 | 98 | 96 | 95 | 93 | | | |
| 12. | 13. | 100 | 100 | 100 | 100 | 99 | 99 | 97 | 86 | 82 | | | | |
| *13. | 14. | 100 | 100 | 100 | 99 | 97 | 94 | 90 | 80 | 60 | | | | |
| *14. | 15. | | | 96 | 93 | 80 | 75 | 50 | 15 | 0 | 0 | 0 | 0 | 0 |
| *15. | 16. | | | | | 70 | 55 | 40 | 0 | 0 | 0 | 0 | 0 | 0 |
| 16. | 17. | | | | | | 50 | 20 | 0 | 0 | 0 | 0 | 0 | 0 |
| 17. | 18. | | | | | | 25 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| 18. | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

* These places require multiplication by the following factors to allow for losses in $CO_2$ gas. Under average sea-level outdoor conditions the $CO_2$ (partial pressure = 0.0003 atmos.) amounts to about 0.6 grams per cu.m. Paschen gives 3 times as much for indoor conditions.
2μ to 3μ, for 2 grams in $m^2$ path (95); for 140 grams in $m^2$ path (93);
4 " 5, " " " " " " (93); " " " " " " (70); more $CO_2$ no further effect;
13 " 14, slight allowance to be made;
14 " 15, 80 grams in $m^2$ path reduces energy to zero;
15 " 16, " " " " " " " " " ".
† These places require multiplication by 0.90 and 0.70 respectively for one air mass and 0.85 and 0.65 for two air masses to allow for ozone absorption when the radiation comes from a celestial body.

F. Paschen gives (*Annalen d. Physik. u. Chemie*, 51, p. 14, 1894) the absorption of the radiation from a blackened strip at 500° C. by a layer 33 centimeters thick of water vapor at 100° *C.* and atmospheric pressure as follows:

| | | | |
|---|---|---|---|
| Wave length............ | μ μ 2.20–3.10 | μ μ 5.33–7.67 | μ μ 7.67–10 (?) |
| Percentage absorption... | 80 | 94 | 94–13 |

The following table, due to Rubens and Aschkinass (*Annalen d. Physik u. Chemie*, 64, p. 598, 1898), gives the absorption of radiation from a zircon burner by a layer 75 centimeters thick of water vapor saturated at 100° *C.* This amount of vapor is about equivalent to a layer of water 0.45 millimeter thick or to 1.5% of the water in a total vertical atmospheric column whose dew-point at sea-level is 10° *C.* The region of spectrum examined includes most of the region of terrestrial radiation.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Wave length.......... | μ 7.0 | μ 8.0 | μ μ 9.0–12.0 | μ 12.4 | μ 12.8 | μ 13.4 | μ 14.0 |
| Percentage absorption... | 75 | 40 | 6 | 20 | 13 | 28 | 22 |
| Wave length.......... | μ 14.3 | μ 15.0 | μ 15.7 | μ 16.0 | μ 17.5 | μ 18.3 | μ 20.0 |
| Percentage absorption... | 43 | 35 | 65 | 52 | 88 | 80 | 100 |

## INTERNATIONAL METEOROLOGICAL SYMBOLS.

The International Meteorological Symbols were adopted at the Vienna meteorological congress of 1873. A few additions and modifications have been made at subsequent international meteorological meetings. The forms of these symbols are more or less flexible. Those shown in the accompanying table are the forms which have generally been used in the United States, and with two exceptions ("wet fog" and "zodiacal light") are identical with those used by the Prussian Meteorological Institute and given in the German editions of the International Meteorological Codex. The principal variants found in the meteorological publications of the different countries are given in the *Monthly Weather Review* (Wash., D.C.), May, 1916, p. 268.

*Exponents.* — An exponent added to a symbol indicates the degree of intensity, ranging from ° weak (light, etc.) to ² strong (heavy, etc.). Thus, ●°, light rain; ●², heavy rain. German and French observers use the exponent ¹ to denote medium intensity, in accordance with the German and French versions of the report of the Vienna congress, and the German editions of the Codex. The English version of the above-mentioned report and the English edition of the Codex provide for the use of only two exponents, ° and ²; hence in English-speaking countries the omission of the exponent indicates medium intensity.

*Time of occurrence.* — When hours of occurrence are added to symbols, the abbreviation *a* is used for a.m., and *p* for p.m. Thus, ● 10a – 4p denotes "rain from 10 a.m. to 4 p.m." 12*a* = noon; 12*p* = midnight. The abbreviation *n* means "during night." Stations taking tri-daily observations may use *a* to mean between the first and second observation; *p*, between the second and third; and *n*, between the third and the first.

For further information concerning the International Symbols and other meteorological symbols, see "Meteorological Symbols," by C. Fitzhugh Talman, *Monthly Weather Review* (Wash., D.C.), May, 1916, pp. 265–274.

## INTERNATIONAL METEOROLOGICAL SYMBOLS.

| Symbol. | Meaning. | Remarks. |
|---|---|---|
| ● | Rain. | |
| ✳ | Snow. | |
| ⚡ | Thunderstorm. | Thunder and lightning. |
| T | Thunder. | Without lightning. |
| ≮ | Lightning. | Without thunder; "heat-lightning." |
| ▲ | Hail.* | |
| △ | Graupel. | Sometimes called "soft hail." French, *grésil.* Resembles little snow-pellets. |
| ≡ | Fog. | |
| ≡ | Ground fog. | Not exceeding the height of a man. |
| ≡: | Wet fog. | One which wets exposed surfaces. |
| ⌴ | Hoarfrost. | |
| ⌓ | Dew. | |
| V | Rime. | A rough frost deposit from fog. |
| ∾ | Glaze; Glazed frost.† | Ice coating due to rain, "ice-storm." In America often called "sleet." |
| → | Driving snow. | Ger., *Schneegestöber;* Fr., *bourrasque de neige.* |
| ← | Ice-crystals. | Ice-needles sometimes seen floating or slowly falling in the air in clear, cold weather. |
| ⊠ | Snow on ground. | Ground near station more than half covered. |
| ⟶ | Gale. | Wind of force 8–12, Beaufort scale. (Rept. Int. Met'l Comm., Berlin, 1910, English ed., p. 17.) Formerly used for "strong wind." A 3-barbed arrow is introduced in the 2d German ed. of the Int. Met'l Codex to denote "strong wind," but no authority is cited. According to the Observer's Handbook of the British Met'l Office "the number of barbs on the arrow may conveniently be made to represent the strongest wind force noted," but there is no international sanction for such variants. |
| ⊙ | Sunshine. | In German edition of Int. Met'l Codex, but has never been definitely recognized by the international organization. (See Rept. Int. Met'l Comm., Southport, 1903, Engl. ed., p. 19 and 101.) Widely used in German and Austrian publications. |
| ⊕ | Solar halo. | |
| ⦶ | Solar corona. | |
| ⊍ | Lunar halo. | |
| ⋓ | Lunar corona. | |
| ⌒ | Rainbow. | |
| ⏏ | Aurora. | |
| ⩚ | Zodiacal light. | |
| ∞ | Haze. | Due to fine dust, or to the disturbance of atmospheric transparency by air-currents of different densities ("optical turbidity"), and not to water-drops. In practice, this is often difficult to distinguish from light fog (≡°), or "mist" of British observers. Prussian and Austrian observers underscore this symbol ($\underline{\infty}$) to denote a definitely *smoky* atmosphere ("Moorrauch"). |

* True hail, which occurs chiefly with summer thunderstorms, should be distinguished from the snowy pellets, like miniature snowballs, known as *graupel,* or *soft hail* (△): also from the small particles of clear ice, called *sleet* by the U.S. Weather Bureau, for which there is no international symbol. On the history of the word *sleet* see *Monthly Weather Review,* May, 1916, pp. 281–286.

† *Glaze* is the official term in the United States; *glazed frost* in Great Britain.

## INTERNATIONAL CLOUD CLASSIFICATION.

The International Conference of Meteorologists held at Munich in 1891 recommended the following classification of clouds, elaborated by Messrs. Abercromby and Hildebrandsson:

*a.* Detached clouds with rounded upper outlines (most frequent in dry weather).
*b.* Clouds of great horizontal extent suggesting a layer or sheet (wet weather).

A. **Upper Clouds**, average altitude $9000^m$.

*a.* 1. *Cirrus.*
*b.* 2. *Cirro-stratus.*

B. **Intermediate Clouds**, between $3000^m$ and $7000^m$.

*a.* { 3. *Cirro-cumulus.*
{ 4. *Alto-cumulus.*
*b.* 5. *Alto-stratus.*

C. **Lower Clouds**, below $2000^m$.

*a.* 6. *Strato-cumulus.*
*b.* 7. *Nimbus.*

D. **Clouds of diurnal ascending currents.**

*a.* 8. *Cumulus;* top $1800^m$; base $1400^m$.
*b.* 9. *Cumulo-nimbus;* top $3000^m$ to $8000^m$; base $1400^m$.

E. **High Fogs**, under $1000^m$.

10. *Stratus.*

### DEFINITIONS AND DESCRIPTIONS OF CLOUD FORMS.

1. **Cirrus** (Ci.). — *Detached clouds of delicate and fibrous appearance, often showing a feather-like structure, generally of a whitish color.* Cirrus clouds take the most varied shapes, such as isolated tufts, thin filaments on a blue sky, threads spreading out in the form of feathers, curved filaments ending in tufts, sometimes called *Cirrus uncinus*, etc.; they are sometimes arranged in parallel belts which cross a portion of the sky in a great circle, and by an effect of perspective appear to converge towards a point on the horizon, or, if sufficiently extended, towards the opposite point also. (Ci.-St. and Ci.-Cu., etc., are also sometimes arranged in similar bands.)

2. **Cirro-stratus** (Ci.-St.). — *A thin, whitish sheet of clouds* sometimes covering the sky completely and giving it only a milky appearance (it is then called *Cirro-nebula*), at other times presenting, more or less distinctly, a formation like a tangled web. This sheet often produces halos around the Sun and Moon.

3. **Cirro-cumulus** (Ci.-Cu.). **Mackerel sky.** — *Small globular masses or white flakes without shadows, or showing very slight shadows, arranged in groups and often in lines.*

4. **Alto-stratus** (A.-St.). — *A thick sheet of a gray or bluish color,* sometimes forming a compact mass of dark gray color and fibrous structure. At other times the sheet is thin, resembling thick Ci.-St., and through it the Sun or the Moon may be seen dimly gleaming as through ground glass. This form exhibits all changes peculiar to Ci.-St., but from measurements its average altitude is found to be about one half that of Ci.-St.

5. **Alto-cumulus** (A.-Cu.). — *Largish globular masses, white or grayish, partially shaded, arranged in groups or lines, and often so closely packed that their edges appear confused.* The detached masses are generally larger and more compact (resembling St.-Cu.) at the center of the group, but the thickness of the layer varies. At times the masses spread themselves out and assume the appearance of small waves or thin slightly curved plates. At the margin they form into finer flakes (resembling Ci.-Cu.). They often spread themselves out in lines in one or two directions.

6. **Strato-cumulus** (St.-Cu.). — *Large globular masses or rolls of dark clouds often covering the whole sky, especially in winter.* Generally St.-Cu. presents the appearance of a gray layer irregularly broken up into masses of which the edge is often formed of smaller masses, often of wavy appearance resembling A.-Cu. Sometimes this cloud-form presents the characteristic appearance of great rolls arranged in parallel lines and pressed close up against one another. In their centers these rolls are of a dark color. Blue sky may be seen through the intervening spaces which are of a much lighter color. (Roll-cumulus in England, Wulst-cumulus in Germany.) St.-Cu. clouds may be distinguished from Nb. by their globular or rolled appearance, and by the fact that they are not generally associated with rain.

7. **Nimbus** (Nb.), **Rain Clouds.** — *A thick layer of dark clouds, without shape and with ragged edges,* from which *steady* rain or snow usually falls. Through the openings in these clouds an upper layer of Ci.-St. or A.-St. may be seen almost invariably. If a layer of Nb.

separates up in a strong wind into shreds, or if small loose clouds are visible floating underneath a large Nb., the cloud may be described as *Fracto-nimbus* (Fr.-Nb.) (" Scud " of sailors).

8. **Cumulus (Cu.), Wool pack Clouds.** — *Thick clouds of which the upper surface is dome-shaped and exhibits protuberances while the base is horizontal.* These clouds appear to be formed by a diurnal ascensional movement which is almost always noticeable. When the cloud is opposite the Sun, the surfaces facing the observer have a greater brilliance than the margins of the protuberances. When the light falls aslant, as is usually the case, these clouds throw deep shadows; when, on the contrary, the clouds are on the same side of the observer as the Sun, they appear dark with bright edges.

True cumulus has well defined upper and lower limits, but in strong winds a broken cloud resembling Cumulus is often seen in which the detached portions undergo continual change. This form may be distinguished by the name *Fracto-cumulus* (Fr.-Cu.).

9. **Cumulo-nimbus (Cu.-Nb.), The Thunder-Cloud; Shower-Cloud.** — *Heavy masses of cloud rising in the form of mountains, turrets or anvils, generally surmounted by a sheet or screen of fibrous appearance (false Cirrus) and having at its base a mass of cloud similar to nimbus.* From the base local showers of rain or snow (occasionally of hail or soft hail) usually fall. Sometimes the upper edges assume the compact form of cumulus, and form massive peaks round which delicate " false Cirrus " floats. At other times the edges themselves separate into a fringe of filaments similar to Cirrus clouds. This last form is particularly common in spring showers.

The front of thunder-clouds of wide extent frequently presents the form of a large arc spread over a portion of a uniformly brighter sky.

10. **Stratus (St.).** — *A uniform layer of cloud resembling a fog but not resting on the ground.* When this sheet is broken up into irregular shreds in a wind, or by the summits of mountains, it may be distinguished by the name *Fracto-stratus* (Fr.-St.).

During summer all low clouds tend to assume forms resembling Cumulus, and may be described accordingly as *Stratus cumuliformis*, *Nimbus cumuliformis*, etc.

The term *Mammato-cumulus* is applied to a cloud having a mammillated lower surface, occurring especially in connection with severe local storms.

The ovoid form, with sharp edges, assumed by certain clouds, particularly during the occurrence of sirocco, mistral or foehn, is indicated by the adjective *lenticularis*, e.g., *Cumulus lenticularis* (*Cu. lent.*), *Stratus lenticularis* (*St. lent.*). Such clouds frequently show iridescence.

For pictures of typical cloud forms see "International Cloud Atlas," 2d ed., Paris, 1910; also U.S. Weather Bureau, "Classification of Clouds for the Guidance of Observers," Washington, D.C., 1911, and Gt. Britain, Meteorological Office, "Observer's Handbook," London (annual).

## BEAUFORT WEATHER NOTATION.

Especially intended for the use of mariners, but sometimes used at land stations. The original notation was devised in 1805 by Admiral Sir F. Beaufort; it has since been slightly altered and amplified by British and American meteorologists. The following symbols are used by the marine observers of the U.S. Weather Bureau: —

Upper Atmosphere:
- *b.* — Blue sky.
- *c.* — Cloudy sky.
- *o.* — Overcast sky.

Lower Atmosphere:
- *v.* — Visibility (exceptionally clear).
- *z.* — Haze.
- *m.* — Mist.
- *f.* — Fog.

Precipitation:
- *d.* — Drizzling.
- *p.* — Passing showers.
- *r.* — Rain.
- *s.* — Snow.
- *h.* — Hail.

Electric phenomena:
- *l.* — Lightning.
- *t.* — Thunder.

Wind:
- *q.* Squally.

The British Meteorological Office also uses the following: —

- *e.* — Wet air without rain.
- *g.* — Gloom.
- *u.* — Ugly or threatening appearance of the weather.
- *w.* — Dew.

"The letters *b*, *c*, *o* are intended to refer only to the amount of cloud visible, and not to its density, form or other quality. They have gradually come to be regarded as corresponding to the following cloud amounts in the scale 0–10: $b$ = 0 to 3; $bc$ or $cb$ = 4 to 6; $c$ = 7 or 8; $o$ = 9 or 10." — Marine Observer's Handbook, Lond., 1915, p. 82.

U.S. Weather Bureau Observers use a line (light or heavy) under the symbol, British observers a dot or two dots, to indicate great intensity. Thus, U.S., $\underline{r}$ heavy rain, $\underline{\underline{r}}$, very heavy rain. British, $\underset{\cdot}{r}$, heavy rain; $\underset{:}{r}$, very heavy rain.

## LIST OF METEOROLOGICAL STATIONS.

NOTE.—Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| NORTH AMERICA. | Latitude. | | Longitude from Greenwich. | | Height. | |
|---|---|---|---|---|---|---|
| | | | | | Feet. | m. |
| **GREENLAND.** | | | | | | |
| *Angmagsalik | 65° | 37′ N. | 37° | 34′ W. | 104 | 32 |
| *Godthaab | 64 | 11 | 51 | 44 | 30 | 9 |
| Ivigtut | 61 | 12 | 48 | 10 | 16 | 5 |
| *Jacobshavn | 69 | 13 | 51 | 2 | 41 | 13 |
| *North Star Bay | 76 | 30 | 68 | 55 | 2 | 0.6 |
| *Upernivik | 72 | 47 | 56 | 7 | 44 | 19 |
| **ICELAND.** | | | | | | |
| *Berufjord | 64 | 40 N. | 14 | 19 W. | 59 | 18 |
| *Grimsey (Akureyri) | 66 | 33 | 17 | 58 | 22 | 7 |
| *Stykkisholm | 65 | 5 | 22 | 46 | 37 | 11 |
| *Vestmanno | 63 | 26 | 20 | 15 | 23 | 8 |
| **FÄRO ISLANDS.** | | | | | | |
| *Thorshavn | 62 | 3 N. | 6 | 45 W. | 30 | 26 |
| **ALASKA.** | | | | | | |
| *Dutch Harbor | 53 | 55 N. | 166 | 32 W. | 13 | 4 |
| *Eagle | 64 | 46 | 141 | 12 | 835 | 255 |
| Juneau | 58 | 18 | 134 | 24 | 80 | 24 |
| *Nome | 64 | 30 | 165 | 24 | 23 | 7 |
| *Sitka | 57 | 4 | 135 | 20 | 63 | 19 |
| *Tanana | 65 | 10 | 152 | 6 | 220 | 67 |
| *Valdez | 61 | 7 | 146 | 16 | 23 | 7 |
| **CANADA AND NEWFOUNDLAND.** | | | | | | |
| Banff | 51 | 10 N. | 115 | 34 W. | 4521 | 1378 |
| *Barkerville | 53 | 2 | 121 | 35 | 4180 | 1274 |
| *Belle Isle | 51 | 55 | 55 | 20 | 436 | 133 |
| *Berens River | 52 | 18 | 97 | 23 | 709 | 216 |
| *Calgary | 51 | 2 | 114 | 2 | 3389 | 1033 |
| *Carcross | 60 | 11 | 134 | 34 | 2172 | 662 |
| *Davis Inlet | 55 | 50 | 60 | 50 | | ? |
| *Dawson | 64 | 4 | 139 | 20 | 1053 | 321 |
| Father Point | 48 | 31 | 68 | 19 | 20 | 6 |
| *Fort Chipewyan | 58 | 42 | 111 | 10 | 715 | 218 |
| *Fort Hope | 51 | 32 | 87 | 48 | | ? |
| *Fort Resolution | 61 | 00 | 113 | 00 | 787 | 240 |
| *Fort Simpson | 61 | 52 | 120 | 43 | 423 | 129 |
| Fredericton | 45 | 57 | 66 | 36 | 164 | 50 |
| Halifax | 44 | 39 | 63 | 36 | 88 | 29 |
| *Hay River | 60 | 51 | 115 | 20 | 525 | 161 |
| *Hebron (Labrador) | 58 | 12 | 62 | 21 | 49 | 16 |
| *Kamloops | 50 | 41 | 120 | 29 | 1243 | 379 |
| Kingston | 44 | 13 | 76 | 29 | 285 | 87 |
| *Macleod | 49 | 44 | 113 | 24 | 3130 | 954 |
| *Minnedosa | 50 | 15 | 99 | 50 | 1699 | 518 |
| Montreal | 45 | 30 | 73 | 35 | 187 | 57 |
| *Moose Factory | 51 | 16 | 80 | 56 | 30 | 9 |
| *Nain | 56 | 33 | 61 | 41 | 13 | 4 |
| Parry Sound | 45 | 19 | 80 | 00 | 635 | 193 |
| *Point Riche | 50 | 42 | 57 | 25 | 36 | 11 |
| Port Arthur | 48 | 27 | 89 | 12 | 643 | 196 |
| *Prince Albert | 53 | 10 | 106 | 00 | 1430 | 436 |
| *Prince Rupert | 54 | 18 | 130 | 18 | 171 | 52 |

## LIST OF METEOROLOGICAL STATIONS.

Note.—Stations with asterisk appear in the 'Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| CANADA. (*Continued.*) | Latitude. | Longitude from Greenwich. | Height. Feet. | Height. m. |
|---|---|---|---|---|
| *Qu'Appelle | 50° 30′ N. | 103° 47′ W. | 2116 | 645 |
| Quebec | 46 48 | 71 13 | 296 | 90 |
| *Sable Island | 43 57 | 60 6 | 26 | 8 |
| *St. John, N.B. | 45 17 | 66 4 | 119 | 36 |
| *St. Johns, Newfoundland | 47 34 | 52 42 | 125 | 38 |
| *S.W. Point, Anticosti | 49 24 | 63 35 | 30 | 9 |
| Sydney | 46 10 | 60 10 | 48 | 11 |
| *Toronto | 43 40 | 79 24 | 379 | 116 |
| *Victoria | 48 24 | 123 19 | 230 | 70 |
| *Winnipeg | 49 53 | 97 7 | 760 | 232 |
| Woodstock | 43 8 | 80 47 | 980 | 299 |
| *York Factory | 57 00 | 92 28 | 36 | 11 |
| UNITED STATES. | | | | |
| *Abilene | 32 23 N. | 99 40 W. | 1738 | 530 |
| Albany | 42 39 | 73 45 | 97 | 30 |
| Alpena | 45 5 | 83 30 | 609 | 186 |
| Amarillo | 35 13 | 101 50 | 3676 | 1120 |
| Asheville | 35 36 | 82 32 | 2255 | 687 |
| Atlanta | 33 45 | 84 23 | 1174 | 358 |
| Atlantic City | 39 22 | 74 25 | 52 | 16 |
| Augusta | 33 28 | 81 54 | 180 | 55 |
| Baltimore | 39 17 | 76 37 | 123 | 37 |
| Binghamton | 42 6 | 75 55 | 871 | 265 |
| *Bismarck | 46 47 | 100 38 | 1674 | 510 |
| Block Island | 41 10 | 71 36 | 26 | 8 |
| Blue Hill | 42 12 | 71 6 | 640 | 195 |
| Boise | 43 37 | 116 13 | 2739 | 835 |
| Boston | 42 21 | 71 4 | 125 | 38 |
| Buffalo | 42 53 | 78 53 | 767 | 234 |
| Cairo | 37 0 | 89 10 | 356 | 108 |
| Cape Henry | 36 56 | 76 0 | 18 | 5 |
| *Charleston | 32 47 | 79 56 | 48 | 15 |
| Charlotte | 35 13 | 80 51 | 779 | 237 |
| Chattanooga | 35 4 | 85 14 | 762 | 232 |
| *Cheyenne | 41 8 | 104 48 | 6088 | 1855 |
| *Chicago | 41 53 | 87 37 | 823 | 251 |
| Cincinnati | 39 6 | 84 30 | 628 | 191 |
| Cleveland | 41 30 | 81 42 | 762 | 232 |
| Columbia, Mo | 38 57 | 92 20 | 784 | 239 |
| Columbia, S.C | 34 0 | 81 3 | 351 | 107 |
| Columbus | 39 58 | 83 0 | 824 | 251 |
| Concord | 43 12 | 71 32 | 288 | 88 |
| Corpus Christi | 27 49 | 97 25 | 20 | 6 |
| Davenport | 41 30 | 90 38 | 606 | 185 |
| *Denver | 39 45 | 105 0 | 5291 | 1613 |
| Des Moines | 41 35 | 93 37 | 861 | 262 |
| Detroit | 42 20 | 83 3 | 730 | 222 |
| Dodge City | 37 45 | 100 0 | 2509 | 765 |
| Drexel | 41 20 | 96 16 | 1299 | 396 |
| Dubuque | 42 30 | 90 44 | 698 | 213 |
| *Duluth | 46 47 | 92 6 | 1133 | 345 |
| Eastport | 44 54 | 66 59 | 76 | 23 |
| Elkins | 38 53 | 79 49 | 1947 | 593 |
| El Paso | 31 47 | 106 30 | 3762 | 1147 |
| Erie | 42 7 | 80 5 | 714 | 217 |

## LIST OF METEOROLOGICAL STATIONS.

NOTE. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| UNITED STATES. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Escanaba | 45° | 48′ N. | 87° | 5′ W. | 612 | 187 |
| Eureka | 40 | 48 | 124 | 11 | 62 | 19 |
| Evansville | 37 | 58 | 87 | 33 | 431 | 131 |
| Fort Smith | 35 | 22 | 94 | 24 | 457 | 139 |
| Fort Worth | 32 | 43 | 97 | 15 | 670 | 204 |
| Fresno | 36 | 43 | 119 | 49 | 330 | 101 |
| *Galveston | 29 | 18 | 94 | 50 | 54 | 16 |
| Grand Haven | 43 | 5 | 86 | 13 | 632 | 193 |
| Grand Junction | 39 | 4 | 108 | 34 | 4602 | 1403 |
| Green Bay | 44 | 31 | 88 | 0 | 617 | 188 |
| Harrisburg | 40 | 16 | 76 | 52 | 374 | 114 |
| Hartford | 41 | 46 | 72 | 40 | 159 | 48 |
| Havre | 48 | 34 | 109 | 40 | 2505 | 764 |
| *Helena | 46 | 34 | 112 | 4 | 4110 | 1253 |
| Houghton | 47 | 7 | 88 | 34 | 668 | 204 |
| Houston | 29 | 47 | 95 | 24 | 138 | 42 |
| Huron | 44 | 21 | 98 | 14 | 1306 | 398 |
| Indianapolis | 39 | 46 | 86 | 10 | 822 | 251 |
| Ithaca | 42 | 27 | 76 | 29 | 836 | 255 |
| Jacksonville | 30 | 20 | 81 | 39 | 43 | 13 |
| Kalispell | 48 | 10 | 114 | 25 | 2973 | 906 |
| Kansas City | 39 | 5 | 94 | 37 | 963 | 293 |
| *Key West | 24 | 33 | 81 | 48 | 22 | 7 |
| Knoxville | 35 | 56 | 83 | 58 | 996 | 304 |
| La Crosse | 43 | 49 | 91 | 15 | 714 | 218 |
| Lander | 42 | 50 | 108 | 45 | 5372 | 1637 |
| Lansing | 42 | 44 | 84 | 26 | 878 | 268 |
| Lewiston | 46 | 25 | 117 | 2 | 757 | 231 |
| Lexington | 38 | 2 | 84 | 33 | 989 | 301 |
| Lincoln | 40 | 49 | 96 | 45 | 1189 | 362 |
| Little Rock | 34 | 45 | 92 | 16 | 357 | 109 |
| Los Angeles | 34 | 3 | 118 | 15 | 338 | 103 |
| Louisville | 38 | 15 | 85 | 45 | 525 | 160 |
| Lynchburg | 37 | 25 | 79 | 9 | 681 | 207 |
| Macon | 32 | 50 | 83 | 38 | 370 | 113 |
| Madison | 43 | 5 | 89 | 23 | 974 | 297 |
| Marquette | 46 | 34 | 87 | 24 | 734 | 224 |
| Memphis | 35 | 9 | 90 | 3 | 399 | 122 |
| Meridian | 32 | 21 | 88 | 40 | 375 | 114 |
| Milwaukee | 43 | 2 | 87 | 54 | 681 | 207 |
| Minneapolis | 44 | 59 | 93 | 18 | 918 | 280 |
| *Mobile | 30 | 41 | 88 | 2 | 57 | 17 |
| Montgomery | 32 | 23 | 86 | 18 | 223 | 68 |
| Moorhead | 46 | 52 | 96 | 44 | 940 | 287 |
| Mount Tamalpais | 37 | 56 | 122 | 35 | 2375 | 724 |
| Mount Weather | 39 | 4 | 77 | 53 | 1725 | 526 |
| Nantucket | 41 | 17 | 70 | 6 | 12 | 4 |
| *Nashville | 36 | 10 | 86 | 47 | 546 | 166 |
| New Haven | 41 | 18 | 72 | 56 | 106 | 32 |
| *New Orleans | 29 | 57 | 90 | 4 | 53 | 16 |
| *New York | 40 | 43 | 74 | 0 | 314 | 111 |
| Norfolk | 36 | 51 | 76 | 17 | 91 | 28 |
| North Head | 46 | 16 | 124 | 4 | 211 | 64 |
| *North Platte | 41 | 08 | 100 | 45 | 2821 | 860 |
| Northfield | 44 | 10 | 72 | 41 | 876 | 267 |
| Oklahoma City | 35 | 26 | 97 | 33 | 1214 | 370 |
| Omaha | 41 | 16 | 95 | 56 | 1105 | 337 |

# LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| UNITED STATES. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Oswego | 43° | 29′ N. | 76° | 35′ W. | 335 | 102 |
| Parkersburg | 39 | 16 | 81 | 36 | 638 | 194 |
| Pensacola | 30 | 25 | 87 | 13 | 56 | 17 |
| Philadelphia | 39 | 57 | 75 | 9 | 117 | 36 |
| Phœnix | 33 | 28 | 112 | 0 | 1108 | 338 |
| Pike's Peak | 38 | 50 | 105 | 2 | 14134 | 4308 |
| Pittsburgh | 40 | 32 | 80 | 2 | 842 | 257 |
| Pocatello | 42 | 52 | 112 | 29 | 4477 | 1365 |
| Port Huron | 43 | 0 | 82 | 26 | 638 | 194 |
| Portland, Me | 43 | 39 | 70 | 15 | 103 | 31 |
| *Portland, Oreg | 45 | 32 | 122 | 41 | 153 | 47 |
| Providence | 41 | 50 | 71 | 25 | 160 | 49 |
| Pueblo | 38 | 18 | 104 | 36 | 4685 | 1428 |
| Raleigh | 35 | 45 | 78 | 37 | 376 | 115 |
| Richmond | 37 | 32 | 77 | 27 | 144 | 44 |
| Rochester | 43 | 8 | 77 | 42 | 523 | 159 |
| Roseburg | 43 | 13 | 123 | 20 | 510 | 155 |
| Sacramento | 38 | 35 | 121 | 30 | 69 | 21 |
| *St. Louis | 38 | 38 | 90 | 12 | 568 | 173 |
| St. Paul | 44 | 58 | 93 | 3 | 837 | 255 |
| Salt Lake City | 40 | 46 | 111 | 54 | 4360 | 1329 |
| San Antonio | 29 | 27 | 98 | 28 | 693 | 211 |
| *San Diego | 32 | 43 | 117 | 10 | 87 | 26 |
| Sandusky | 41 | 25 | 82 | 40 | 629 | 192 |
| *San Francisco | 37 | 48 | 122 | 26 | 155 | 47 |
| *Santa Fé | 35 | 41 | 105 | 57 | 7013 | 2138 |
| Sault Ste. Marie | 46 | 30 | 84 | 21 | 614 | 187 |
| Savannah | 32 | 5 | 81 | 5 | 65 | 20 |
| Scranton | 41 | 24 | 75 | 42 | 805 | 245 |
| Seattle | 47 | 38 | 122 | 20 | 125 | 38 |
| Shreveport | 32 | 30 | 93 | 40 | 249 | 76 |
| Spokane | 47 | 40 | 117 | 25 | 1929 | 588 |
| Springfield, Ill | 39 | 48 | 89 | 39 | 636 | 194 |
| Springfield, Mo | 37 | 12 | 93 | 18 | 1324 | 403 |
| Syracuse | 43 | 2 | 76 | 10 | 597 | 182 |
| Tacoma | 47 | 16 | 122 | 23 | 213 | 65 |
| Tampa | 27 | 57 | 82 | 27 | 35 | 11 |
| Tatoosh Island | 48 | 23 | 124 | 44 | 86 | 26 |
| Taylor | 30 | 35 | 97 | 20 | 583 | 178 |
| Toledo | 41 | 40 | 83 | 34 | 628 | 191 |
| Topeka | 39 | 3 | 95 | 41 | 987 | 301 |
| Valentine | 42 | 50 | 100 | 32 | 2598 | 792 |
| Vicksburg | 32 | 22 | 90 | 53 | 247 | 75 |
| *Washington | 38 | 54 | 77 | 3 | 112 | 34 |
| Wichita | 37 | 41 | 97 | 20 | 1358 | 414 |
| Williston | 48 | 9 | 103 | 35 | 1878 | 572 |
| Wilmington | 34 | 14 | 77 | 57 | 78 | 24 |
| Wytheville | 36 | 56 | 81 | 5 | 2304 | 702 |
| Yankton | 42 | 54 | 97 | 28 | 1233 | 376 |
| MEXICO, CENTRAL AMERICA AND WEST INDIES. | | | | | | |
| *Barbados (Windward Islands) | 13 | 8 N. | 59 | 36 W. | 180 | 55 |
| Basseterre (St. Kitts) | 17 | 18 | 62 | 43 | 29 | 9 |
| *Belize (Brit. Honduras) | 17 | 29 | 88 | 12 | 6 | 2 |
| *Bermuda (Fort Prospect) | 32 | 17 | 64 | 46 | 151 | 46 |

## LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| MEXICO, CENTRAL AMERICA AND WEST INDIES. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Bridgetown (Barbados) | 13° | 4′ N. | 59° | 37′ W. | 30 | 9 |
| Camp Jacob (Guadeloupe) | 16 | 00 | 62 | 2 | 1650 | 503 |
| Cienfuegos (Cuba) Montserrat | 22 | 11 | 80 | 33 | 52 | 16 |
| Colon (Panama) | 9 | 23 | 79 | 53 | 36 | 11 |
| *Culebra (Panama) | 9 | 10 | 79 | 40 | 404 | 123 |
| Fort de France (Martinique) | 14 | 36 | 61 | 5 | 13 | 4 |
| Grand Turk (Turks Is.) | 21 | 21 | 71 | 7 | 11 | 3 |
| *Grenada (Richmond Hill) | 12 | 3 | 61 | 45 | 508 | 155 |
| Guanajuato (Mexico) | 21 | 00 | 101 | 15 | 6640 | 2024 |
| Guatemala | 14 | 37 | 90 | 31 | 4888 | 1490 |
| *Havana (Cuba) | 23 | 9 | 82 | 21 | 74 | 23 |
| *Jamaica (Negril Point) | 18 | 15 | 78 | 23 | 33 | 10 |
| Kingston (Jamaica) | 17 | 58 | 76 | 48 | 24 | 7 |
| *Leon (Mexico) | 21 | 7 | 101 | 41 | 5899 | 1799 |
| Mazatlan (Mexico) | 23 | 11 | 106 | 25 | 25 | 8 |
| *Mexico (Mexico) | 19 | 26 | 99 | 8 | 7480 | 2280 |
| *Morelia (Mexico) | 19 | 14 | 100 | 7 | 6342 | 1933 |
| *Nassau (Bahamas) | 25 | 5 | 77 | 21 | 26 | 8 |
| *Oaxaca (Mexico) | 17 | 4 | 96 | 44 | 5128 | 1563 |
| *Port au Prince (Haiti) | 18 | 34 | 72 | 22 | 118 | 37 |
| Port of Spain (Trinidad) | 10 | 35 | 61 | 30 | 40 | 12 |
| Puebla (Mexico) | 19 | 2 | 98 | 11 | 7116 | 2169 |
| Puerto Principe (Cuba) | 21 | 23 | 77 | 56 | 352 | 107 |
| Roseau (Dominica) | 15 | 17 | 61 | 23 | 25 | 8 |
| *St. Croix (Christiansted) | 17 | 45 | 64 | 42 | 23 | 7 |
| St. Thomas (Virgin Is.) | 18 | 20 | 64 | 55 | 24 | 7 |
| *Salina Cruz (Mexico) | 16 | 12 | 95 | 16 | 184 | 56 |
| Saltillo (Mexico) | 25 | 25 | 100 | 56 | 5399 | 1645 |
| San Domingo (San Domingo) | 18 | 28 | 69 | 53 | 65 | 20 |
| San José (Costa Rica) | 9 | 56 | 34 | 8 | 3724 | 1135 |
| San Juan (Porto Rico) | 18 | 29 | 66 | 07 | 82 | 25 |
| San Luis Potosi (Mexico) | 22 | 5 | 100 | 59 | 6200 | 1890 |
| *San Salvador (Central America) | 13 | 44 | 89 | 9 | 2155 | 657 |
| Santiago de Cuba (Cuba) | 19 | 55 | 75 | 50 | 82 | 25 |
| Tacubaya (Mexico) | 19 | 24 | 99 | 12 | 7621 | 2323 |
| Vera Cruz (Mexico) | 19 | 12 | 96 | 8 | 23 | 7 |
| Willemstad (Curaçao) | 12 | 6 | 68 | 56 | 75 | 23 |
| *Zacatecas (Mexico) | 22 | 47 | 102 | 35 | 8015 | 2610 |
| *Zapotlan (Mexico) | 19 | 38 | 103 | 37 | 5016 | 1529 |
| **SOUTH AMERICA.** | | | | | | |
| Andalgalá (Argentina) | 27 | 30 S. | 66 | 26 W. | 3517 | 1072 |
| Aracajú (Brazil) | 10 | 55 | 37 | 4 | 14 | 4 |
| *Arequipa (Peru) | 16 | 22 | 71 | 33 | 8041 | 2451 |
| Asuncion (Paraguay) | 25 | 32 | 57 | 48 | 312 | 95 |
| *Bahía Blanca (Argentina) | 38 | 45 | 62 | 15 | 82 | 25 |
| Bello Horizonte (Brazil) | 19 | 54 | 43 | 30 | 2812 | 857 |
| Bogotá (Colombia) | 4 | 35 N. | 74 | 14 | 8579 | 2615 |
| *Buenos Aires (Argentina) | 34 | 36 S. | 58 | 22 | 72 | 22 |
| Caldera (Chile) | 27 | 3 | 70 | 53 | 98 | 30 |
| *Caracas (Venezuela) | 10 | 31 N. | 66 | 56 | 3419 | 1042 |
| Catamarca (Argentina) | 28 | 27 S. | 65 | 47 | 1673 | 510 |
| *Cayenne (French Guiana) | 4 | 56 N. | 52 | 21 | 20 | 6 |
| Ceres (Argentina) | 29 | 55 S. | 61 | 58 | 285 | 87 |
| Chaco (Paraguay) | 23 | 23 | 58 | 25 | 361 | 110 |
| Concordia (Argentina) | 31 | 23 | 58 | 2 | 79 | 24 |

## LIST OF METEOROLOGICAL STATIONS.

NOTE.—Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London. 1917.)

| SOUTH AMERICA. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Coquimbo (Chile) | 29° | 56′ S. | 71° | 21′ W. | 82 | 25 |
| *Córdoba (Argentina) | 31 | 25 | 64 | 12 | 1388 | 423 |
| Corrientes (Argentina) | 27 | 27 | 58 | 49 | 177 | 54 |
| *Curityba (Brazil) | 25 | 26 | 49 | 16 | 2979 | 908 |
| *Cuyaba (Brazil) | 15 | 36 | 56 | 00 | 771 | 235 |
| El Misti (Peru) | | | | | | |
| Summit Station | 16 | 16 | 71 | 30 | 19200 | 5852 |
| Mt. Blanc station | 16 | 16 | 71 | 30 | 15700 | 4785 |
| *El Peru (Venezuela) | 7 | 30 N. | 62 | 00 | ?984 | ?300 |
| *Fernando Noronha (Brazil) | 3 | 51 S. | 32 | 25 | 312 | 95 |
| *Georgetown (Brit. Guiana) | 6 | 50 N. | 58 | 12 | 6 | 2 |
| *Goya (Argentina) | 29 | 9 S. | 59 | 15 | 210 | 64 |
| Iquique (Chile) | 20 | 12 | 70 | 11 | 33 | 10 |
| Isla Chañaral (Chile) | 29 | 1 | 71 | 37 | 157 | 48 |
| *Islota de los Evangelistas (Chile) | 52 | 24 | 75 | 6 | 180 | 55 |
| Juan Fernandez (Chile) | 33 | 37 | 78 | 50 | 33 | 10 |
| La Plata (Argentina) | 34 | 9 | 57 | 9 | 60 | 18 |
| Lima (Peru) | 16 | 4 | 77 | 3 | 520 | 158 |
| *Manaos (Brazil) | 3 | 8 | 59 | 59 | 105 | 32 |
| *Montevideo (Uruguay) | 34 | 54 | 56 | 12 | 96 | 29 |
| *Paramaribo (Dutch Guiana) | 5 | 49 N. | 55 | 9 | 13 | 4 |
| Paraná (Argentina) | 41 | 43 S. | 60 | 31 | 256 | 78 |
| *Porto Alegre (Brazil) | 30 | 2 | 51 | 13 | 85 | 26 |
| Potosi (Bolivia) | 19 | 38 | 65 | 25 | 13287 | 4050 |
| *Puerto de Antofagasta (Chile) | 23 | 39 | 70 | 25 | 16 | 5 |
| *Puerto de Arica (Chile) | 18 | 28 | 70 | 20 | 33 | 10 |
| *Puerto de Punta Arenas (Chile) | 53 | 10 | 70 | 54 | 13 | 4 |
| *Punta Angeles (Chile) | 33 | 1 | 71 | 38 | 131 | 40 |
| Punta Carranza (Chile) | 35 | 36 | 72 | 38 | 98 | 30 |
| *Punta Corona (Chile) | 41 | 51 | 73 | 50 | 82 | 25 |
| *Punta Dungeness (Chile) | 52 | 24 | 68 | 25 | 16 | 5 |
| *Punta Galera (Chile) | 40 | 1 | 73 | 44 | 131 | 40 |
| *Punta Tortuga (Chile) | 29 | 56 | 71 | 21 | 82 | 25 |
| Quito (Ecuador) | 0 | 14 | 78 | 32 | 9337 | 2846 |
| *Rio de Janeiro (Brazil) | 22 | 54 | 43 | 10 | 197 | 61 |
| *Rio Grande do Sul (Brazil) | 32 | 2 | 52 | 6 | 7 | 2 |
| Rosario (Paraguay) | 32 | 55 | 60 | 38 | 85 | 26 |
| San Juan (Argentina) | 31 | 32 | 68 | 42 | 2168 | 664 |
| *Santiago (Chile) | 33 | 27 | 70 | 42 | 1706 | 520 |
| *São Paulo (Brazil) Observatorio | 23 | 34 | 46 | 38 | 2690 | 820 |
| *Sucre (Bolivia) | 19 | 3 | 67 | 17 | 9331 | 2844 |
| Torre do Recife (Pernambuco, Brazil) | 8 | 4 | 34 | 53 | 97 | 30 |
| Valparaiso (Chile) | 33 | 1 | 71 | 38 | 131 | 40 |
| Villa Colon (Uruguay) Observatorio Prado | 34 | 51 | 56 | 19 | 95 | 29 |
| EUROPE. | | | | | | |
| NORWAY AND SWEDEN. | | | | | | |
| *Bergen (Norway) | 60 | 24 N. | 5 | 19 E. | 144 | 44 |
| *Bodö (Norway) | 67 | 17 | 14 | 24 | 67 | 21 |
| Carlshamn (Sweden) | 56 | 10 | 14 | 52 | 39 | 12 |
| Christiania (Norway) | 59 | 55 | 10 | 43 | 82 | 25 |
| *Christiansund (Norway) | 63 | 7 | 7 | 45 | 59 | 18 |

## LIST OF METEOROLOGICAL STATIONS.

Note.—Stations with asterisk appear in the "Réseau Mondial" in the British Meteorological Office for 1912. (London, 1917.)

| NORWAY AND SWEDEN. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Dovre (Norway) | 62° | 5′ N. | 9° | 7′ E. | 2113 | 644 |
| Florö (Norway) | 61 | 36 | 5 | 2 | 26 | 7 |
| *Gjesvaer (Norway) | 71 | 6 | 25 | 22 | 20 | 6 |
| *Haparanda (Sweden) | 65 | 50 | 24 | 9 | 30 | 9 |
| Härnösand (Sweden) | 62 | 37 | 17 | 57 | 66 | 20 |
| *Mehavn (Norway) | 71 | 1 | 27 | 47 | 20 | 6 |
| Skudenes (Norway) | 59 | 9 | 5 | 16 | 12 | 4 |
| Stockholm (Sweden) | 59 | 21 | 18 | 4 | 144 | 44 |
| *Trondhjem (Norway) | 63 | 26 | 10 | 25 | 131 | 40 |
| *Upsala (Sweden) | 59 | 51 | 17 | 38 | 79 | 24 |
| *Vardö (Norway) | 70 | 22 | 31 | 8 | 33 | 10 |
| RUSSIA. (With Siberia and Finland.) | | | | | | |
| Akhtuba | 48 | 18° N. | 46 | 9 E. | 16 | 5 |
| *Akmolinsk | 51 | 12 | 71 | 23 | ?1138 | ?347 |
| *Arkhangelsk | 64 | 33 | 40 | 32 | 22 | 7 |
| Askhabad | 37 | 57 | 58 | 23 | 741 | 226 |
| *Astrakhan | 46 | 21 | 48 | 2 | −46 | −14 |
| *Barnaoul | 53 | 20 | 83 | 47 | 558 | 170 |
| Batoum | 41 | 40 | 41 | 38 | 10 | 3 |
| Belagatchskoe Zimovie | 51 | 00 | 80 | 18 | 1043 | 318 |
| *Berezov | 63 | 56 | 65 | 4 | 131 | 40 |
| *Blagovyeshchensk | 50 | 15 | 127 | 38 | ?525 | ?160 |
| *Blagovyeshchensk Priisk | 58 | 10 | 114 | 17 | ?1608 | ?490 |
| Bogoslovsk | 59 | 45 | 60 | 1 | 636 | 194 |
| Choucha | 39 | 46 | 46 | 45 | 4487 | 1368 |
| Dorpat | 58 | 22 | 26 | 43 | 243 | 74 |
| Derkoulskoe verderie | 49 | 3 | 39 | 48 | 499 | 152 |
| *Doudinka | 69 | 7 | 87 | 00 | ?66 | ?20 |
| *Ekaterinburg | 56 | 50 | 60 | 38 | 948 | 289 |
| Elatma | 54 | 58 | 41 | 45 | 459 | 140 |
| Elisavetgrad | 48 | 31 | 32 | 17 | 403 | 123 |
| *Eniseisk | 58 | 27 | 92 | 11 | 276 | 84 |
| *Fort Alexandrovsk | 44 | 31 | 50 | 16 | 79 | 24 |
| Goloustnoe | 52 | 1 | 105 | 27 | 1529 | 466 |
| Goudaour | 42 | 28 | 44 | 28 | 7231 | 2204 |
| *Helsingfors | 60 | 10 | 24 | 57 | 38 | 12 |
| *Iakoutsk | 62 | 1 | 129 | 43 | 354 | ?108 |
| *Irgiz | 48 | 37 | 61 | 16 | 367 | 112 |
| *Irkutsk | 52 | 16 | 104 | 19 | 1532 | 467 |
| *Jurjev | 58 | 23 | 26 | 43 | 246 | 75 |
| Kamenaïa Steppe | 51 | 3 | 40 | 42 | 623 | 190 |
| Kansk | 56 | 12 | 95 | 39 | 715 | 218 |
| Kargopol | 61 | 30 | 38 | 57 | 420 | 128 |
| Kars | 40 | 37 | 43 | 5 | 5731 | 1747 |
| Kazalinsk | 45 | 46 | 62 | 7 | 230 | 70 |
| *Kazan | 55 | 47 | 49 | 8 | 262 | 80 |
| Kem | 64 | 57 | 34 | 39 | 41 | 13 |
| Kerki | 37 | 50 | 65 | 13 | 804 | 245 |
| *Kharkov (University) | 50 | 00 | 36 | 14 | 459 | 140 |
| *Kiev | 50 | 27 | 30 | 30 | 600 | 183 |
| *Kirensk | 57 | 47 | 108 | 7 | 886 | 270 |
| *Kola | 68 | 53 | 33 | 1 | 22 | 7 |
| *Krasnovodsk | 40 | 00 | 52 | 59 | −49 | −15 |

# LIST OF METEOROLOGICAL STATIONS.

Note.—Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| RUSSIA. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| *Kuopio | 62° | 54′ N. | 27° | 40′ E. | 328 | 100 |
| Kursk | 51 | 45 | 36 | 12 | 774 | 236 |
| *Lenkoran | 38 | 46 | 48 | 52 | −62 | −19 |
| Libava | 56 | 31 | 21 | 1 | 16 | 5 |
| Lubny (Gymnasium) | 50 | 1 | 33 | 22 | 541 | 165 |
| Lugansk | 48 | 35 | 39 | 20 | 148 | 45 |
| Magaratch | 44 | 32 | 34 | 13 | 262 | 80 |
| *Malye Karmakouly | 72 | 23 | 52 | 43 | 48 | 15 |
| Mariupolskoe verderie | 47 | 39 | 37 | 30 | 919 | 280 |
| Mezen | 65 | 50 | 44 | 16 | 53 | 16 |
| *Minousinsk | 53 | 43 | 91 | 41 | 837 | ?255 |
| *Moscow | 55 | 45 | 37 | 34 | 512 | 156 |
| *Narynskoe | 41 | 26 | 76 | 2 | ?6611 | ?2015 |
| *Nertchinsk | 51 | 59 | 116 | 35 | 1588 | 484 |
| Nertchinski Zavod | 51 | 19 | 119 | 37 | 2041 | 622 |
| Nijni Novgorod | 56 | 20 | 44 | 00 | 518 | 158 |
| *Nikolaevsk-sur-Amour | 53 | 8 | 140 | 45 | 69 | 21 |
| Nikolaief | 46 | 58 | 31 | 58 | 64 | 20 |
| Nikolsk | 59 | 32 | 45 | 27 | 508 | 156 |
| Novaia Alexandria | 51 | 25 | 21 | 57 | 482 | 147 |
| *Novorossiisk | 44 | 40 | 37 | 49 | 121 | 37 |
| *Obdorsk | 66 | 31 | 66 | 35 | 86 | 24 |
| *Odessa (University) | 46 | 29 | 30 | 46 | 213 | 65 |
| *Okhotsk | 59 | 21 | 143 | 17 | 20 | 6 |
| *Olekminsk | 60 | 22 | 120 | 26 | ?663 | ?202 |
| *Omsk | 54 | 58 | 73 | 23 | 289 | 88 |
| Orel | 52 | 58 | 36 | 4 | 600 | 183 |
| *Orenburg | 51 | 45 | 55 | 6 | 374 | 114 |
| *Oust-Maïskoe | 60 | 25 | 134 | 29 | ?328 | ?100 |
| *Oust-Tsylma | 65 | 27 | 52 | 10 | ?82 | ?25 |
| *Paikanskii Sklad | 50 | 11 | 130 | 7 | ?551 | ?168 |
| Pamirski Post | 38 | 11 | 74 | 2 | ?11942 | ?3640 |
| Pavlovsk | 59 | 41 | 30 | 29 | 130 | 40 |
| Pensa | 53 | 11 | 45 | 1 | 706 | 215 |
| *Perm | 58 | 1 | 56 | 15 | 535 | 163 |
| Pernov | 58 | 23 | 24 | 30 | 32 | 10 |
| *Petrograd | 59 | 56 | 30 | 16 | 16 | 5 |
| *Petropavlosk | 52 | 53 | 158 | 47 | 285 | 87 |
| *Petrozavodsk | 61 | 47 | 34 | 23 | 128 | 39 |
| Pinsk | 52 | 7 | 26 | 6 | 466 | 142 |
| Ploti | 47 | 57 | 29 | 10 | 468 | 143 |
| Polibino | 53 | 44 | 52 | 56 | 355 | 108 |
| Povenets | 62 | 51 | 34 | 49 | 141 | 43 |
| Rostov on Don | 47 | 13 | 39 | 43 | 161 | 49 |
| Rykovskoe | 50 | 47 | 142 | 55 | 410 | 125 |
| Saguny | 50 | 36 | 39 | 43 | 685 | 209 |
| Samarkand | 39 | 39 | 66 | 57 | 2369 | 722 |
| Sarapul | 56 | 28 | 53 | 49 | 397 | 121 |
| *Saratov | 51 | 32 | 46 | 3 | 197 | 60 |
| Smolensk | 54 | 47 | 32 | 4 | 791 | 241 |
| Sodankylä | 67 | 25 | 26 | 36 | 590 | 180 |
| *Sourgout | 61 | 15 | 73 | 24 | ?131 | ?40 |
| Stavropol | 45 | 3 | 41 | 59 | 1909 | 582 |
| *Tachkent | 41 | 20 | 69 | 18 | 1568 | 478 |
| *Tchita | 52 | 2 | 113 | 30 | 2211 | 674 |

## LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the " Réseau Mondial " of the British Meteorological Office for 1912. (London, 1917.)

| RUSSIA. (*Continued.*) | Latitude. | Longitude from Greenwich. | Height. Feet. | Height. m. |
|---|---|---|---|---|
| Termez | 37° 12′ N. | 67° 15′ E. | 1017 | 310 |
| *Tiflis | 41 43 | 44 48 | 1342 | 409 |
| Tiumen | 57 10 | 65 32 | 292 | 89 |
| *Tobolsk | 58 12 | 68 14 | 354 | 108 |
| *Tomsk | 56 30 | 84 58 | 400 | 122 |
| Totaikoi | 44 54 | 34 11 | 994 | 303 |
| *Touroukhanst | 65 55 | 87 38 | ?131 | ?40 |
| Troitskosavsk | 50 22 | 106 27 | 2520 | 768 |
| *Troitsko-Petcherskoe | 62 42 | 56 13 | 404 | ?123 |
| Tulun | 54 33 | 100 22 | 1617 | 493 |
| *Tygan Ourkan | 54 5 | 124 46 | ?1214 | ?370 |
| Ufa | 54 43 | 55 56 | 571 | 174 |
| Uman | 48 45 | 30 13 | 709 | 216 |
| Uralsk | 51 12 | 51 22 | 124 | 38 |
| Uspenskaia | 56 38 | 39 12 | 783 | 239 |
| Valaam | 61 23 | 30 57 | 122 | 37 |
| Varshava (Warsaw) (University) | 52 15 | 21 1 | 394 | 120 |
| Vasilevitchi | 52 16 | 29 48 | 440 | 134 |
| Velikiia Louki | 56 21 | 30 31 | 341 | 104 |
| *Velsk | 61 5 | 42 7 | ?285 | ?87 |
| Verkhniaia Michikha | 51 30 | 105 58 | 4199 | 1280 |
| *Verkhoïansk | 67 33 | 133 24 | 328 | 100 |
| *Vernyĭ | 43 16 | 76 53 | 2566 | 782 |
| Vĭatka | 58 36 | 49 41 | 607 | 185 |
| Vilno | 54 41 | 25 18 | 486 | 148 |
| *Vladivostok | 43 7 | 131 54 | 88 | 27 |
| Vlotslavsk | 52 40 | 19 4 | 213 | 65 |
| Vologda | 59 14 | 39 53 | 407 | 124 |
| Vycknii Volotchok | 57 35 | 34 34 | 548 | 167 |
| Zlatoust | 55 10 | 59 41 | 1502 | 458 |
| **FRANCE.** | | | | |
| Bagnères-de-Bigorre | 43 4 N. | 0 9 E. | 1795 | 547 |
| Besançon (Observatoire) | 47 15 | 5 59 | 1020 | 311 |
| Bordeaux | 44 50 | 0 31 W. | 243 | 74 |
| Brest | 48 23 | 4 30 | 200 | 61 |
| Chamonix | 45 55 | 7 2 E. | 3406 | 1038 |
| Cherbourg | 49 39 | 1 38 W. | 43 | 13 |
| Dunkerque | 51 2 | 2 22 E. | 23 | 7 |
| Langres | 47 52 | 5 20 | 1529 | 466 |
| Lyon (Saint-Genis-Laval) | 45 41 | 4 47 | 981 | 299 |
| *Marseilles | 43 18 | 5 23 | 246 | 75 |
| Mont Blanc (Grands Mulets) | 45 52 | 6 51 | 9908 | 3020 |
| Mont Blanc (Chamonix) | 45 55 | 6 51 | 3405 | 1038 |
| Mont Blanc (Les Bosses) | | | 14301 | 4359 |
| Mont Blanc (Sommet) | 45 59 | 6 51 | 15781 | 4810 |
| Mont Ventoux | 44 10 | 5 16 | 6234 | 1900 |
| Montpellier | 43 37 | 3 53 | 118 | 36 |
| *Nantes | 47 15 | 1 34 W. | 135 | 41 |
| Nice (Observatoire) | 43 43 | 7 18 E. | 1115 | 340 |
| Paris (Central Meteo. Bureau) | 48 52 | 2 18 | 108 | 33 |
| *Paris (Parc Saint Maur) | 48 49 | 2 29 | 164 | 50 |
| Paris (Eiffel) | 48 52 | 2 18 | 1027 | 313 |
| Paris (Montsouris) | 48 49 | 2 20 | 253 | 77 |
| Perpignan | 42 42 | 2 53 | 102 | 31 |

## LIST OF METEOROLOGICAL STATIONS.

NOTE. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| FRANCE. (Continued.) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Pic du Midi de Bigorre | 42° | 56′ N. | 0° | 8′ E. | 9380 | 2859 |
| Puy de Dome (Plain) | 45 | 46 | 3 | 5 | 1309 | 399 |
| Puy de Dome (Summit) | 45 | 46 | 2 | 57 | 4813 | 1467 |
| Sainte-Honorine-du-Fay | 49 | 5 | 0 | 30 W. | 387 | 118 |
| Toulouse | 43 | 37 | 1 | 27 E. | 636 | 194 |
| **GERMANY.** | | | | | | |
| Aachen (Prussia) | 50 | 47 N. | 6 | 6 E. | 672 | 205 |
| Ansbach (Bavaria) | 49 | 18 | 10 | 33 | 1437 | 438 |
| Altenberg (Saxony) | 50 | 46 | 13 | 46 | 2481 | 756 |
| Augsburg (Bavaria) | 48 | 22 | 10 | 54 | 1640 | 500 |
| Bad Elster (Saxony) | 50 | 17 | 12 | 15 | 1644 | 501 |
| Bamberg (Bavaria) | 49 | 53 | 10 | 53 | 943 | 288 |
| Bautzen (Saxony) | 51 | 11 | 14 | 26 | 669 | 204 |
| Bayreuth (Bavaria) | 49 | 57 | 11 | 34 | 1190 | 363 |
| Berlin (Prussia) | 52 | 30 | 13 | 25 | 125 | 38 |
| Borkum (Prussia) | 53 | 35 | 6 | 40 | 26 | 8 |
| Bremen | 53 | 5 | 8 | 48 | 52 | 16 |
| Breslau (Prussia) | 51 | 7 | 17 | 2 | 482 | 147 |
| Brocken (Prussia) | 51 | 47 | 10 | 37 | 3766 | 1148 |
| Bromberg (Prussia) | 53 | 8 | 18 | 0 | 177 | 54 |
| Chemnitz (Saxony) | 50 | 50 | 12 | 55 | 1092 | 333 |
| Dresden (Saxony) | 51 | 3 | 13 | 44 | 361 | 110 |
| Erfurt (Prussia) | 50 | 58 | 11 | 4 | 718 | 219 |
| Freiberg (Saxony) | 50 | 55 | 13 | 21 | 1336 | 407 |
| Friedrichshafen (Württemberg) | 47 | 39 | 37 | 55 | 1338 | 408 |
| Grosser Belchen (Alsace) | 47 | 53 | 7 | 6 | 4573 | 1394 |
| *Hamburg | 53 | 33 | 9 | 59 | 85 | 26 |
| Helgoland (North Sea) | 54 | 10 | 7 | 51 | 144 | 44 |
| Höchenschwand (Baden) | 47 | 44 | 8 | 10 | 3296 | 1005 |
| Hohenheim (Württemberg) | 48 | 43 | 9 | 14 | 1319 | 402 |
| Hohenspeissenberg (Bavaria) | 47 | 48 | 11 | 1 | 3261 | 994 |
| Kahl a. M. (Bavaria) | 50 | 4 | 9 | 1 | 374 | 114 |
| Kaiserlautern (Bavaria) | 49 | 27 | 7 | 46 | 794 | 242 |
| Karlsruhe (Baden) | 49 | 1 | 8 | 25 | 416 | 127 |
| Keitum (Prussia) | 54 | 54 | 8 | 22 | 26 | 8 |
| Kiel (Prussia) | 54 | 20 | 10 | 9 | 155 | 47 |
| Königsberg (Prussia) | 54 | 43 | 20 | 30 | 33 | 10 |
| Landshut (Bavaria) | 48 | 32 | 12 | 10 | 1305 | 398 |
| Leipzig (Saxony) | 51 | 20 | 12 | 23 | 391 | 119 |
| Ludwigshafen (Bavaria) | 49 | 29 | 8 | 26 | 329 | 100 |
| Magdeburg (Prussia) | 52 | 8 | 11 | 38 | 177 | 54 |
| Memel (Prussia) | 55 | 43 | 21 | 7 | 33 | 10 |
| München (Bavaria) | 48 | 9 | 11 | 34 | 1726 | 526 |
| Münster (Westfalen) | 51 | 58 | 7 | 37 | 210 | 64 |
| Neufahrwasser (Prussia) | 54 | 24 | 18 | 40 | 15 | 5 |
| Nürnberg (Bavaria) | 49 | 27 | 11 | 3 | 1014 | 309 |
| Passau (Bavaria) | 48 | 34 | 13 | 28 | 1015 | 309 |
| Posen (Prussia) | 52 | 25 | 16 | 56 | 216 | 66 |
| *Potsdam observatory (Prussia) | 52 | 23 | 13 | 4 | 279 | 85 |
| Regensburg (Bavaria) | 49 | 1 | 12 | 7 | 1161 | 354 |
| Reitzenhain (Saxony) | 50 | 34 | 13 | 14 | 2551 | 778 |
| Rügenwaldermünde (Prussia) | 54 | 26 | 16 | 23 | 10 | 3 |
| Schneeberg (Saxony) | 50 | 36 | 12 | 38 | 1452 | 443 |
| Schneekoppe (Prussia) | 50 | 44 | 15 | 44 | 5282 | 1610 |

# LIST OF METEOROLOGICAL STATIONS.

NOTE. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| | Latitude. | | Longitude from Greenwich. | | Height. | |
|---|---|---|---|---|---|---|
| | | | | | Feet. | m. |
| **GERMANY.** (*Continued.*) | | | | | | |
| Strassburg (Alsace) | 48° | 35′ N. | 7° | 46′ E. | 471 | 144 |
| Stuttgart (Württemberg) | 48 | 47 | 9 | 11 | 883 | 269 |
| Swinemünde (Prussia) | 53 | 56 | 14 | 16 | 33 | 10 |
| Villingen (Baden) | 48 | 4 | 8 | 27 | 2342 | 714 |
| Wiesbaden (Prussia) | 50 | 5 | 8 | 14 | 374 | 114 |
| Wilhelmshaven (Oldenburg) | 53 | 32 | 8 | 9 | 28 | 8 |
| Würzburg (Bavaria) | 49 | 48 | 9 | 56 | 588 | 179 |
| Wustrow (Mecklenburg) | 54 | 21 | 12 | 24 | 23 | 7 |
| Zittau (Saxony) | 51 | 54 | 14 | 49 | 827 | 252 |
| **HOLLAND.** | | | | | | |
| Amsterdam | 52 | 23 N. | 4 | 55 E. | 9 | 2 |
| *De Bilt | 52 | 6 | 5 | 11 | 45 | 3 |
| Groningen | 53 | 13 | 6 | 33 | 29 | 9 |
| Helder | 52 | 58 | 4 | 45 | 18 | 6 |
| Maastricht | 50 | 51 | 5 | 41 | 167 | 61 |
| Rotterdam | 51 | 54 | 4 | 29 | 66 | 4 |
| Vlissingen | 51 | 26 | 3 | 34 | 26 | 8 |
| **BELGIUM.** | | | | | | |
| Arlon | 49 | 40 N. | 5 | 48 E. | 1450 | 442 |
| Bruxelles | 50 | 51 | 4 | 22 | 131 | 40 |
| Furnes | 51 | 4 | 2 | 40 | 20 | 6 |
| Liége | 50 | 37 | 5 | 34 | 246 | 75 |
| Maeseyck | 51 | 6 | 5 | 48 | 115 | 35 |
| Ostende | 51 | 14 | 2 | 55 | 23 | 7 |
| *Uccle | 50 | 48 | 4 | 22 | 328 | 100 |
| **BRITISH ISLES.** | | | | | | |
| *Aberdeen | 57 | 10 N. | 2 | 6 W. | 88 | 27 |
| Armagh | 54 | 21 | 6 | 39 | 200 | 61 |
| Ben Nevis | 56 | 48 | 5 | 00 | 4405 | 1343 |
| Bidston (Liverpool) | 53 | 24 | 3 | 4 | 188 | 57 |
| Deerness, Orkney Is | 58 | 56 | 2 | 45 | 164 | 50 |
| Falmouth | 50 | 9 | 5 | 4 | 167 | 51 |
| Fort William | 56 | 49 | 5 | 7 | 39 | 12 |
| Glasgow | 55 | 53 | 4 | 18 | 180 | 55 |
| *Greenwich | 51 | 28 | 0 | 00 | 157 | 48 |
| Holyhead (Harbour office) | 53 | 18 | 4 | 29 | 57 | 17 |
| Kew | 51 | 28 | 0 | 19 | 18 | 6 |
| *Lerwick | 60 | 9 | 1 | 8 | 59 | 18 |
| London (Westminster) | 51 | 30 | 0 | 8 | 76 | 23 |
| Malin Head | 55 | 23 | 7 | 24 | 208 | 63 |
| Oxford | 51 | 46 | 1 | 16 | 208 | 63 |
| Scilly Islands, St. Mary's | 49 | 56 | 6 | 18 | 131 | 40 |
| Shields North | 55 | 0 | 1 | 27 | 96 | 29 |
| Southport | 53 | 39 | 2 | 59 | 37 | 11 |
| Stonyhurst College | 53 | 51 | 2 | 28 | 375 | 114 |
| Stornoway | 58 | 11 | 6 | 22 | 51 | 16 |
| Sumburgh head | 59 | 51 | 1 | 17 | 112 | 34 |
| *Valencia | 51 | 56 | 10 | 15 | 46 | 14 |
| Yarmouth | 52 | 37 | 1 | 43 E. | 17 | 5 |

## LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| | Latitude. | Longitude from Greenwich. | Height. Feet. | Height. m. |
|---|---|---|---|---|
| SPAIN AND PORTUGAL. | | | | |
| Barcelona (Spain) | 41° 23′ N. | 2° 10′ E. | 138 | 42 |
| Cadiz (Spain) | 36 31 | 6 18 W. | 46 | 14 |
| Coimbra (Portugal) | 40 12 | 8 25 | 459 | 140 |
| *Horta (Portugal) | 38 32 | 28 38 | 98 | 30 |
| *Las Palmas (Canary Is.) | 28 1 | 15 26 | 30 | 9 |
| *Lisbon (Portugal) | 38 43 | 9 9 | 312 | 95 |
| *Madeira (Funchal) | 32 37 | 16 54 | 82 | 25 |
| *Madrid (Spain) | 40 24 | 3 41 | 2149 | 655 |
| Oña (Spain) | 42 44 | 3 25 | 1903 | 580 |
| Oporto (Portugal) | 41 8 | 8 36 | 328 | 100 |
| Oviedo (Spain) | 43 23 | 5 48 | 801 | 244 |
| *Palma (Spain) | 39 33 | 2 42 E. | ? | ? |
| *Ponta Delgada (Azores) | 37 44 | 25 40 W. | 56 | 17 |
| *Puerto de Orotava (Canary Is.) | 28 25 | 16 32 | ?328 | ?100 |
| San Fernando (Spain) | 36 28 | 0 25 | 92 | 28 |
| Sierra da Estrêlla (Portugal) | 40 25 | 7 35 | 4547 | 1386 |
| Teneriffe (Canary Is.) | 28 25 | 16 30 | 454 | 138 |
| Tortosa (Spain) Observatorio del Ebro | 40 49 | 0 29 E. | 167 | 51 |
| Valencia (Spain) | 39 28 | 0 22 W. | 23 | 7 |
| ITALY. | | | | |
| Alessandria | 44 54 N. | 8 37 E. | 321 | 98 |
| Asti | 44 54 | 8 13 | 465 | 142 |
| Avellino | 40 56 | 14 45 | 1871 | 570 |
| Belluno | 46 8 | 12 14 | 1325 | 404 |
| Benevento | 41 7 | 14 48 | 558 | 170 |
| Bergamo | 45 42 | 9 41 | 1267 | 386 |
| Bologna | 44 30 | 11 21 | 279 | 85 |
| Caserta | 41 3 | 13 82 | 250 | 76 |
| Castellaneta | 40 38 | 16 56 | 780 | 238 |
| *Catania (Sicily) | 37 30 | 15 3 | 213 | 65 |
| Conegliano | 45 53 | 12 19 | 279 | 85 |
| Cremona | 45 8 | 10 3 | 222 | 68 |
| Desenzano | 45 28 | 10 32 | 344 | 105 |
| Elena | 41 12 | 13 35 | 147 | 45 |
| Fermo | 43 10 | 13 43 | 919 | 280 |
| Ferrara | 44 51 | 11 37 | 131 | 40 |
| Florence | 43 46 | 11 15 | 238 | 73 |
| Foggia | 41 27 | 15 31 | 287 | 87 |
| Forli | 44 13 | 12 2 | 163 | 50 |
| Genoa | 44 25 | 8 55 | 177 | 54 |
| Ischia | 40 44 | 13 54 | 106 | 32 |
| Lecce | 40 22 | 18 12 | 236 | 72 |
| Leghorn | 43 33 | 10 18 | 78 | 24 |
| Messina | 38 12 | 15 33 | 197 | 60 |
| Milan (Brera) | 45 28 | 9 11 | 482 | 147 |
| Modena | 44 54 | 12 29 | 167 | 51 |
| Moncalieri | 45 0 | 7 41 | 848 | 258 |
| Naples | 40 52 | 14 16 | 489 | 149 |
| Padua | 45 24 | 11 53 | 103 | 31 |
| Palermo | 38 6 | 13 22 | 234 | 71 |
| Pavia | 45 11 | 9 10 | 268 | 82 |
| Perugia | 43 7 | 12 23 | 1706 | 520 |
| Piacenza | 45 3 | 9 40 | 235 | 72 |
| Pisa | 43 44 | 10 24 | 30 | 9 |

## LIST OF METEOROLOGICAL STATIONS.

OTE. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| | Latitude | | Longitude from Greenwich | | Height. | |
|---|---|---|---|---|---|---|
| | | | | | Feet. | m. |
| ITALY. (*Continued.*) | | | | | | |
| Pistoia | 43° | 55′ N. | 10° | 95′ E. | 282 | 86 |
| Prato | 43 | 53 | 11 | 6 | 246 | 75 |
| Reggio, Calabria | 38 | 8 | 15 | 39 | 48 | 15 |
| Riposto | 37 | 41 | 15 | 12 | 46 | 14 |
| Roca di Papa | 41 | 46 | 12 | 43 | 2493 | 760 |
| *Rome, Collegio Romano | 41 | 54 | 12 | 29 | 207 | 63 |
| Rovigo | 45 | 3 | 11 | 47 | 69 | 21 |
| Salo | 45 | 36 | 10 | 29 | 328 | 100 |
| Sassari | 40 | 44 | 8 | 34 | 735 | 224 |
| Sestola | 44 | 15 | 10 | 46 | 3585 | 1092 |
| Siena | 43 | 19 | 11 | 20 | 1143 | 348 |
| Syracuse (Sicily) | 37 | 3 | 15 | 15 | 76 | 23 |
| Teramo | 42 | 40 | 13 | 43 | 945 | 288 |
| Turin | 45 | 4 | 7 | 41 | 907 | 276 |
| Venice | 45 | 26 | 12 | 20 | 70 | 21 |
| SWITZERLAND. | | | | | | |
| Alstätten | 47 | 23 N. | 9 | 33 E. | 1476 | 450 |
| Altdorf | 46 | 53 | 8 | 39 | 1493 | 455 |
| Basel | 47 | 33 | 7 | 35 | 909 | 277 |
| Bern | 46 | 57 | 7 | 26 | 1877 | 572 |
| Castasegna | 46 | 20 | 9 | 31 | 2297 | 700 |
| Chaumont | 47 | 1 | 6 | 59 | 3698 | 1127 |
| Davos Platz | 46 | 48 | 9 | 49 | 5118 | 1561 |
| Geneva | 46 | 12 | 6 | 9 | 1329 | 405 |
| Lugano | 46 | 0 | 8 | 57 | 902 | 275 |
| Neuchâtel | 47 | 0 | 6 | 57 | 1601 | 488 |
| Pilatus-Kulm | 46 | 59 | 8 | 16 | 6781 | 2067 |
| Rigi-Kulm | 47 | 3 | 8 | 30 | 5863 | 1787 |
| Säntis | 47 | 15 | 9 | 20 | 8202 | 2500 |
| Sils-Maria | 46 | 26 | 9 | 46 | 5951 | 1814 |
| St. Bernhard | 45 | 52 | 7 | 11 | 8123 | 2476 |
| *Zürich | 47 | 23 | 8 | 33 | 1687 | 493 |
| AUSTRIA-HUNGARY. | | | | | | |
| Arco | 45 | 55 N. | 10 | 53 E. | 298 | 91 |
| Aussig a.d. Elbe | 50 | 40 | 14 | 2 | 528 | 161 |
| Bielitz | 49 | 49 | 19 | 3 | 1125 | 343 |
| Bruck a.d. Mur | 47 | 25 | 15 | 17 | 1591 | 485 |
| Brünn | 49 | 11 | 16 | 33 | 679 | 207 |
| Bucheben | 47 | 8 | 12 | 58 | 3947 | 1203 |
| *Budapest | 47 | 30 | 19 | 2 | 369 | 112 |
| Dobogókö | 47 | 44 | 18 | 54 | 2290 | 698 |
| Döllach | 46 | 58 | 12 | 54 | 3359 | 1024 |
| Görz | 45 | 57 | 13 | 37 | 308 | 94 |
| Graz | 47 | 4 | 15 | 28 | 1211 | 369 |
| Gries b. Bozen | 46 | 30 | 11 | 20 | 932 | 284 |
| Gyertyó-Szt. Miklos | 46 | 43 | 25 | 36 | 2670 | 814 |
| Herény | 47 | 16 | 16 | 36 | 744 | 227 |
| Innsbruck | 47 | 16 | 11 | 24 | 1903 | 580 |
| Klagenfurt I | 46 | 37 | 14 | 18 | 1476 | 450 |
| Krakau | 50 | 4 | 19 | 57 | 722 | 220 |
| Kremsmünster | 48 | 4 | 14 | 8 | 1260 | 384 |
| Lesina | 43 | 10 | 16 | 26 | 62 | 19 |
| Lussinpiccolo | 44 | 32 | 14 | 28 | 10 | 3 |

## LIST OF METEOROLOGICAL STATIONS.

NOTE. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| AUSTRIA-HUNGARY. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | m. |
|---|---|---|---|---|---|---|
| Marburg | 46° | 34′ N. | 15° | 39′ E. | 886 | 270 |
| Mariabrunn | 48 | 12 | 16 | 14 | 751 | 229 |
| Nagyszeben | 45 | 47 | 24 | 19 | 1358 | 415 |
| Obir (Berghaus) | 46 | 30 | 14 | 29 | 6716 | 2044 |
| Obir (Hannwarte) | 46 | 30 | 14 | 29 | 7021 | 2140 |
| Ó-Gyalla | 47 | 52 | 18 | 12 | 394 | 120 |
| Osielec | 49 | 41 | 19 | 47 | 1378 | 420 |
| Pécs | 46 | 6 | 18 | 14 | 499 | 152 |
| Pelagosa | 42 | 23 | 16 | 16 | 302 | 92 |
| Prag (Petřinwarte) | 50 | 5 | 14 | 24 | 1066 | 325 |
| Prag (Sternwarte) | 50 | 5 | 14 | 25 | 646 | 197 |
| Prerau | 49 | 27 | 17 | 27 | 696 | 212 |
| Rothholz | 47 | 23 | 11 | 48 | 1758 | 536 |
| Schmittenhöhe | 47 | 20 | 12 | 44 | 6456 | 1968 |
| Sonnblick | 47 | 3 | 12 | 57 | 10190 | 3106 |
| St. Katharein a. d. Lamming | 47 | 28 | 15 | 10 | 2083 | 635 |
| St. Pölten | 48 | 12 | 15 | 37 | 899 | 274 |
| Tarnopol | 49 | 33 | 25 | 36 | 1063 | 324 |
| Tragöss | 47 | 31 | 15 | 5 | 2510 | 765 |
| Turkeve | 47 | 7 | 20 | 45 | 288 | 88 |
| Ungvár | 46 | 36 | 22 | 18 | 433 | 132 |
| Weiswasser | 50 | 30 | 14 | 48 | 964 | 294 |
| *Vienna (Hohe Warte) | 48 | 15 | 16 | 22 | 666 | 203 |
| Wiener Neustadt | 47 | 49 | 16 | 15 | 869 | 265 |
| Zágrab | 45 | 49 | 15 | 58 | 531 | 162 |
| Zell am See | 47 | 19 | 12 | 48 | 2503 | 763 |
| Zsombolya | 45 | 47 | 20 | 43 | 269 | 82 |
| BALKAN PENINSULA AND ASIATIC TURKEY. | | | | | | |
| *Athens (Greece) | 37 | 58 N. | 23 | 43 E. | 351 | 107 |
| *Baghdad (Asiatic Turkey) | 33 | 21 | 44 | 28 | 128 | 39 |
| *Beirut (Asiatic Turkey) | 33 | 54 | 35 | 28 | 108 | 33 |
| Belgrad (Servia) | 44 | 48 | 20 | 27 | 453 | 138 |
| Bouïouk-Dere (Asiatic Turkey) | 41 | 10 | 29 | 3 | 384 | 117 |
| *Bucharest (Roumania) | 44 | 25 | 26 | 6 | 269 | 82 |
| *Busrah (Asiatic Turkey) | 30 | 31 | 47 | 53 | 26 | 8 |
| Constantinople (European Turkey) | 41 | 2 | 28 | 58 | 246 | 75 |
| El-Athroun (Palestine) | 31 | 50 | 34 | 60 | 656 | 200 |
| Jerusalem (Palestine) | 31 | 48 | 35 | 11 | 2447 | 746 |
| Kazanlyk (Bulgaria) | 42 | 37 | 25 | 24 | 1220 | 372 |
| Le Krey (Asiatic Turkey) | 33 | 49 | 35 | 40 | 3330 | 1015 |
| Mamouret-ul-Aziz (Asiatic Turkey) | 38 | 30 | 39 | 22 | ?3281 | ?1000 |
| Monastir (Serbia) | 41 | 1 | 19 | 3 | 2024 | 617 |
| Saloniki (Greece) | 40 | 39 | 23 | 7 | 6 | 2 |
| Sarona (Palestine) | 32 | 5 | 34 | 47 | 66 | 20 |
| Scutari (Albania) | 42 | 3 | 19 | 30 | 30 | 9 |
| Sinaia (Roumania) | 45 | 30 | 25 | 34 | 2821 | 860 |
| Sinope (Asiatic Turkey) | 42 | 1 | 35 | 19 | ?59 | ?18 |
| Sivas (Asiatic Turkey) | 39 | 43 | 34 | 50 | 4331 | 1320 |
| Sofia (Bulgaria) | 42 | 42 | 23 | 20 | 1804 | 550 |
| Smyrna (Asiatic Turkey) | 38 | 26 | 24 | 49 | 6 | 2 |
| Sulina (Roumania) | 45 | 9 | 29 | 40 | 6 | 2 |

## LIST OF METEOROLOGICAL STATIONS.

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| | Latitude. | | Longitude from Greenwich. | | Height. | |
|---|---|---|---|---|---|---|
| | | | | | Feet. | m. |
| MEDITERRANEAN. | | | | | | |
| Canea (Crete) | 35° | 30′ N. | 24° | 00′ E. | 105 | 32 |
| *Gibraltar | 36 | 6 | 5 | 21 W. | 52 | 16 |
| Kyrenia (Cyprus) | 35 | 21 | 33 | 19 E. | 52 | 16 |
| Mahon (Minorca) | 39 | 53 | 4 | 18 | 141 | 43 |
| *Malta | 35 | 54 | 14 | 31 | 194 | 59 |
| *Nicosia (Cyprus) | 35 | 12 | 33 | 24 | 72 | 22 |
| ASIA. | | | | | | |
| INDIA (WITH NEIGHBORING COUNTRIES). | | | | | | |
| *Aden (Arabia) | 12 | 45 N. | 45 | 3 E. | 94 | 29 |
| Agra | 27 | 10 | 78 | 5 | 555 | 169 |
| Ajmer | 26 | 27 | 74 | 44 | 1632 | 497 |
| Akola | 20 | 42 | 77 | 4 | 930 | 283 |
| *Akyab (Burma) | 20 | 11 | 92 | 56 | 20 | 6 |
| *Allahabad | 25 | 25 | 81 | 51 | 298 | 91 |
| Amini Divi (Lakkadives) | 11 | 6 | 72 | 45 | 13 | 4 |
| Bangalore | 12 | 58 | 77 | 37 | 2982 | 909 |
| Batticaloa (Ceylon) | 7 | 43 | 81 | 44 | 26 | 8 |
| Belgaum | 15 | 52 | 74 | 34 | 2524 | 769 |
| Bellary | 15 | 9 | 76 | 57 | 1455 | 443 |
| Berhampore | 19 | 18 | 84 | 51 | 67 | 20 |
| *Bombay | 18 | 54 | 72 | 49 | 37 | 11 |
| Burdwan | 23 | 16 | 87 | 54 | 102 | 31 |
| *Bushire (Persia) | 28 | 59 | 50 | 53 | 14 | 4 |
| *Calcutta | 22 | 36 | 88 | 23 | 20 | 6 |
| *Cherrapunji | 25 | 15 | 91 | 42 | 4308 | 1313 |
| Chittagong | 22 | 21 | 91 | 53 | 87 | 26 |
| Cochin | 9 | 58 | 76 | 17 | 10 | 3 |
| *Colombo (Ceylon) | 6 | 54 | 79 | 53 | 23 | 7 |
| *Cothin | 10 | 00 | 76 | 21 | 10 | 3 |
| Cuttack | 20 | 48 | 85 | 54 | 80 | 24 |
| Dacca | 23 | 43 | 90 | 26 | 35 | 11 |
| Darjeeling | 27 | 3 | 88 | 18 | 6960 | 2121 |
| Deesa | 24 | 14 | 72 | 13 | 474 | 144 |
| *Dehra Dun | 30 | 20 | 78 | 00 | 2234 | 681 |
| Dhurbi | 26 | 2 | 90 | 2 | 115 | 35 |
| Diamond Island (Burma) | 15 | 52 | 94 | 19 | 41 | 12 |
| Durbhunga | 26 | 10 | 86 | 00 | 166 | 51 |
| Enzeli (Persia) | 37 | 30 | 49 | 28 | 69 | 21 |
| False Point | 20 | 20 | 86 | 46 | 20 | 6 |
| Galle (Ceylon) | 6 | 1 | 80 | 14 | 48 | 15 |
| *Gauhati | 26 | 8 | 91 | 41 | 194 | 59 |
| Hambantota (Ceylon) | 6 | 7 | 81 | 7 | 40 | 12 |
| Hazaribagh | 23 | 59 | 85 | 25 | 2014 | 614 |
| Hoshangabad | 22 | 46 | 77 | 45 | 1004 | 305 |
| *Hyderabad | 25 | 24 | 68 | 18 | 95 | 29 |
| Jacobabad | 28 | 24 | 68 | 18 | 186 | 57 |
| Jaffna (Ceylon) | 9 | 40 | 79 | 56 | 9 | 3 |
| *Jaipur | 26 | 56 | 75 | 52 | 1431 | 436 |
| *Jask (Persia) | 25 | 44 | 57 | 47 | 13 | 4 |
| Jubbulpore | 23 | 10 | 79 | 59 | 1337 | 408 |
| *Kandy (Ceylon) | 7 | 18 | 80 | 40 | 1654 | 504 |
| Karwar | 14 | 48 | 74 | 11 | 44 | 13 |
| Katmandu | 27 | 42 | 85 | 12 | 4388 | 1337 |

## LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| INDIA. (*Continued.*) | Latitude. | Longitude from Greenwich. | Height. Feet. | Height. m. |
|---|---|---|---|---|
| Khandwa | 21° 50′ N. | 76° 23′ E. | 1037 | 316 |
| *Kodaikanal Observatory | 10 13 | 77 28 | 7688 | 2343 |
| *Kurrachee | 24 53 | 66 57 | 13 | 4 |
| *Lahore | 31 34 | 74 20 | 732 | 223 |
| *Leh | 34 10 | 77 42 | 11503 | 3506 |
| Lucknow | 26 55 | 80 59 | 369 | 112 |
| Ludhiana | 30 55 | 75 54 | 806 | 246 |
| *Madras | 13 4 | 80 14 | 22 | 7 |
| Malacca (Straits Settlements) | 2 12 | 102 14 | 23 | 7 |
| Meerut | 29 1 | 77 45 | 738 | 225 |
| Mercara | 12 26 | 75 47 | 3721 | 1134 |
| Mergui | 12 27 | 98 35 | 96 | 29 |
| *Meshed (Persia) | 36 16 | 59 35 | 3105 | 946 |
| Mooltan | 30 12 | 71 31 | 420 | 128 |
| Mount Abu | 24 36 | 72 45 | 3945 | 1202 |
| Murree | 33 55 | 73 27 | 6333 | 1930 |
| *Mysore | 12 18 | 76 40 | 2520 | 768 |
| *Nagpur | 21 8 | 79 5 | 1017 | 310 |
| Nuwara Eliya (Ceylon) | 6 46 | 80 47 | 6240 | 1902 |
| Nowgong | 25 3 | 79 30 | 757 | 231 |
| Patna | 20 42 | 83 10 | 179 | 54 |
| *Penang (Straits Settlements) | 5 34 | 100 20 | 16 | 5 |
| Periyakulam Observatory | 10 9 | 77 32 | 944 | 288 |
| Peshawar | 34 2 | 71 37 | 1110 | 338 |
| Poona | 18 31 | 73 55 | 1992 | 607 |
| *Port Blair (Andaman Is.) | 11 40 | 92 40 | 59 | 18 |
| Province Wellesley (Straits Settlements | 5 21 | 100 25 | 57 | 17 |
| *Quetta (Baluchistan) | 30 11 | 67 3 | 5502 | 1677 |
| Raipur | 21 15 | 81 41 | 970 | 296 |
| *Rangoon | 16 46 | 95 48 | 20 | 6 |
| Ranikhet | 29 40 | 79 33 | 6069 | 1850 |
| Ratnagiri | 17 8 | 73 19 | 110 | 34 |
| Roorkee | 29 52 | 77 53 | 887 | 270 |
| Salem | 11 39 | 78 12 | 940 | 286 |
| Saugor Island | 21 40 | 88 10 | 6 | 2 |
| Secunderabad | 17 27 | 78 33 | 1787 | 545 |
| *Seychelles | 4 37 S. | 55 27 | 16 | 5 |
| *Shillong | 25 33 N. | 91 48 | 4921 | 1500 |
| Sholapur | 17 40 | 75 56 | 1585 | 483 |
| Sibsagar | 26 59 | 94 41 | 333 | 101 |
| Silchar | 24 50 | 92 51 | 89 | 27 |
| *Simla | 31 7 | 77 8 | 7224 | 2204 |
| *Singapore (Straits Settlements) | 1 17 | 103 51 | 6 | 2 |
| Sutna | 24 34 | 80 55 | 1040 | 317 |
| Trichinopoli | 10 50 | 78 46 | 272 | 83 |
| Trincomalee (Ceylon) | 8 33 | 81 15 | 12 | 4 |
| Vizagapatam | 17 42 | 83 20 | 30 | 9 |
| *Waltair | 17 45 | 83 16 | 30 | 9 |
| Wellington | 11 22 | 76 50 | 6200 | 1890 |
| CHINA AND INDO-CHINA. | | | | |
| Cap-Saint Jacques (Indo-China) | 10 20 N. | 107 5 E. | 607 | 185 |
| *Hang Kow (China) | 30 35 | 114 17 | 121 | 37 |
| Hanoi (Indo-China) | 21 2 | 105 50 | 43 | 13 |
| Harbin (China) | 45 43 | 126 28 | 502 | 153 |

## LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| CHINA AND INDO-CHINA. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. | |
|---|---|---|---|---|---|---|
| | | | | | Feet. | m. |
| *Hong Kong (China) | 22° | 18′ N. | 114° | 10′ E. | 108 | 33 |
| Kashgar (China) | 39 | 25 | 76 | 7 | 3999 | 1219 |
| Lang-biam (Indo-China) | 12 | 2 | 108 | 20 | 4606 | 1404 |
| *Moncay (China) | 21 | 31 | 107 | 51 | 33 | 10 |
| *Mukden (China) | 41 | 48 | 123 | 23 | 144 | 44 |
| *Nha-Trang (Indo-China) | 12 | 16 | 109 | 12 | 23 | 7 |
| Pekin (China) | 39 | 57 | 116 | 28 | 125 | 38 |
| *Phu Lien (China) | 20 | 48 | 106 | 37 | 380 | 116 |
| Pnom-Penh (Indo-China) | 11 | 35 | 104 | 56 | 26 | 8 |
| Pulo-Condor (Indo-China) | 8 | 16 | 106 | 35 | 21 | 6 |
| *Saigon (Indo-China) | 10 | 46 | 106 | 42 | 36 | 11 |
| *Shanghai (China) Zi-Ka-Wei | 31 | 12 | 121 | 26 | 23 | 7 |
| *Tiensin (China) | 39 | 10 | 117 | 10 | 16 | 5 |
| Tsingtau (Kiao-chau) | 36 | 4 | 120 | 19 | 259 | 79 |
| Urga (China) | 47 | 55 | 106 | 50 | ?4447 | ?1325 |
| **JAPAN AND KOREA.** | | | | | | |
| *Chemulpo (Korea) | 37 | 29 N. | 126 | 32 E. | 223 | 68 |
| Fusan (Korea) | 35 | 7 | 129 | 5 | 49 | 15 |
| Hakodate | 41 | 46 | 140 | 44 | 10 | 3 |
| Hirosima | 34 | 23 | 132 | 27 | 10 | 3 |
| Hukuoka | 33 | 35 | 130 | 25 | 20 | 6 |
| *Joshin (Korea) | 40 | 40 | 129 | 11 | 13 | 4 |
| *Kioto | 35 | 1 | 135 | 46 | 161 | 49 |
| Kobe | 34 | 41 | 135 | 11 | 191 | 58 |
| Kumamoto | 32 | 49 | 130 | 42 | 129 | 39 |
| Matsuyama | 33 | 50 | 132 | 45 | 106 | 32 |
| *Miyako | 39 | 38 | 141 | 59 | 98 | 30 |
| *Nagasaki | 32 | 44 | 129 | 52 | 436 | 133 |
| *Naha | 26 | 13 | 127 | 41 | 34 | 10 |
| Nagoya | 35 | 10 | 136 | 55 | 50 | 15 |
| *Nemuro | 43 | 20 | 145 | 35 | 87 | 27 |
| *Ochiai | 47 | 20 | 142 | 44 | 50 | 15 |
| Osaka | 34 | 39 | 135 | 31 | 20 | 6 |
| Sapporo | 43 | 4 | 141 | 21 | 55 | 17 |
| Tadotsu | 34 | 17 | 133 | 46 | 16 | 5 |
| *Taihoku | 25 | 2 | 121 | 31 | 30 | 9 |
| *Tokio | 35 | 41 | 139 | 45 | 70 | 21 |
| Tokushima | 34 | 6 | 134 | 37 | 13 | 4 |
| Tsukubasan | 36 | 13 | 140 | 6 | 2854 | 870 |
| **PHILIPPINES AND HAWAIIAN ISLANDS.** | | | | | | |
| Aparri (Luzon) | 18 | 22 N. | 121 | 38 E. | 16 | 5 |
| Altimonan (Luzon) | 14 | 00 | 121 | 55 | 13 | 4 |
| Baguio (Benguet) | 16 | 25 | 120 | 36 | 4961 | 1512 |
| *Bolinao (Luzon) | 16 | 24 | 119 | 53 | 33 | 10 |
| Cebu (Cebu) | 10 | 18 | 123 | 54 | 30 | 9 |
| Dagupan (Luzon) | 16 | 3 | 120 | 20 | 10 | 3 |
| *Honolulu (Hawaii) | 21 | 19 | 157 | 52 W. | 39 | 12 |
| Iloilo (Panay) | 10 | 42 | 122 | 34 E. | 20 | 6 |
| Legaspi (Luzon) | 13 | 9 | 123 | 45 | 20 | 6 |
| *Manila (Luzon) | 14 | 35 | 120 | 59 | 46 | 14 |
| Midway Island | 28 | 13 | 177 | 22 W. | 19 | 6 |
| *Ormoc (Leyte) | 11 | 00 | 124 | 36 E. | 20 | 6 |

## LIST OF METEOROLOGICAL STATIONS.

Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| PHILIPPINES AND HAWAIIAN ISLANDS. (*Continued.*) | Latitude. | Longitude from Greenwich. | Height. | |
|---|---|---|---|---|
| | | | Feet. | m. |
| *Surigao (Mindanao) | 9° 48′ N. | 125° 29′ E. | 20 | 6 |
| *Tagbilaran (Bohol) | 9 38 | 123 51 | 85 | 26 |
| *Vigan (Luzon) | 17 34 | 120 23 | 49 | 15 |
| EAST INDIES. | | | | |
| *Ambon | 3 42 S. | 128 10 E. | 13 | 4 |
| *Batavia (Java) | 6 11 | 106 50 | 26 | 8 |
| *Christmas Island | 10 25 | 105 43 | 20 | 6 |
| *Cocos Keeling Island | 12 5 | 96 54 | 16 | 5 |
| *Daru (New Guinea) | 9 4 | 143 13 | 26 | 8 |
| *Kajoemas (Java) | 7 56 | 114 9 | 3117 | 950 |
| *Koepang | 10 10 | 123 34 | 10 | 3 |
| *Kota Radja (Sumatra) | 5 32 N. | 95 20 | 23 | 7 |
| *Medan (Sumatra) | 3 35 | 98 41 | 79 | 24 |
| *Padang (Sumatra) | 0 56 S. | 100 22 | 23 | 7 |
| *Passeroean (Java) | 7 38 | 112 55 | 16 | 5 |
| *Pontianak (Borneo) | 0 1 | 109 20 | 10 | 3 |
| *Port Moresby (New Guinea) | 9 29 | 147 9 | 128 | 39 |
| Samarai | 10 37 | 150 40 | 20 | 6 |
| *Sandakan (Borneo) | 5 49 N. | 118 12 | ? | ? |
| AUSTRALASIA. | | | | |
| *Adelaide (South Australia) | 34 56 S. | 138 35 E. | 141 | 43 |
| Albany (West Australia) | 35 2 | 117 50 | 41 | 12 |
| *Alice Springs (South Australia) | 23 38 | 133 37 | 1926 | 587 |
| *Auckland (New Zealand) | 36 50 | 174 50 | 125 | 38 |
| *Boulia (Queensland) | 22 55 | 139 38 | 479 | 146 |
| *Bourke (New South Wales) | 30 13 | 145 58 | 360 | 110 |
| *Brisbane (Queensland) | 27 28 | 153 2 | 137 | 42 |
| Burketown (Queensland) | 17 45 | 139 33 | 27 | 8 |
| Camooweal (Queensland) | 19 57 | 138 17 | 758 | 231 |
| *Christchurch (New Zealand) | 43 32 | 172 38 | 27 | 8 |
| Cooktown (Queensland) | 15 28 | 145 17 | 17 | 5 |
| *Coolgardie (Western Australia) | 30 57 | 121 10 | 1388 | 423 |
| *Daly Waters (Northern Territory) | 16 16 | 133 23 | 699 | 213 |
| *Danger Point (New South Wales) | 34 37 | 19 18 | 66 | 20 |
| *Derby (Western Australia) | 17 18 | 123 40 | 53 | 16 |
| *Dunedin (New Zealand) | 45 52 | 170 31 | 295 | 90 |
| *Eucla (Western Australia) | 31 45 | 128 58 | 15 | 5 |
| *Georgetown (Queensland) | 18 23 | 143 33 | 990 | 302 |
| *Hall's Creek (Western Australia) | 18 13 | 127 46 | 1224 | 373 |
| *Hobart (Tasmania) | 42 53 | 147 20 | 160 | 49 |
| *Katanning (Western Australia) | 33 42 | 117 35 | 1017 | 310 |
| *Launceston (Tasmania) | 41 27 | 147 10 | 30 | 9 |
| *Laverton (Western Australia) | 28 40 | 122 23 | 1463 | 466 |
| Mackay (Queensland) | 21 9 | 149 13 | 36 | 118 |
| *Mein (Queensland) | 13 13 | 142 57 | 400 | 122 |
| *Melbourne (Victoria) | 37 50 | 144 59 | 115 | 35 |
| *Mitchell (Queensland) | 26 32 | 147 52 | 1110 | 337 |
| *Nullagine (Western Australia) | 21 53 | 120 5 | 1270 | 386 |
| *Onslow (Western Australia) | 21 43 | 114 57 | 13 | 4 |
| *Peak Hill (Western Australia) | 25 38 | 118 47 | 1929 | 588 |
| *Perth (Western Australia) | 31 57 | 115 51 | 197 | 60 |
| *Port Darwin (Northern Territory) | 12 28 | 130 51 | 98 | 30 |
| Richmond (Queensland) | 20 44 | 143 10 | 697 | 212 |

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Note. — Stations with asterisk appear in the "Réseau Mondial" of the British Meteorological Office for 1912. (London, 1917.)

| AUSTRALASIA. (*Continued.*) | Latitude. | | | Longitude from Greenwich. | | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|---|---|
| *Rockhampton (Queensland) | 23° | 24′ | S. | 150° | 30′ | E. | 37 | 11 |
| Sandy Cape (Queensland) | 24 | 41 | | 153 | 16 | | 330 | 100 |
| *Streaky Bay (South Australia) | 32 | 48 | | 134 | 13 | | 43 | 13 |
| *Sydney (New South Wales) | 33 | 52 | | 151 | 12 | | 146 | 44 |
| Thargomindah (Queensland) | 27 | 58 | | 143 | 43 | | 402 | 122 |
| Thursday Island (Queensland) | 10 | 34 | | 142 | 12 | | 17 | 5 |
| Townsville Pilot Station (Queensland) | 19 | 14 | | 146 | 51 | | 73 | 22 |
| *Wellington (New Zealand) | 41 | 16 | | 174 | 46 | | 6 | 2 |
| *William Creek (South Australia) | 28 | 55 | | 136 | 21 | | 249 | 76 |
| Windorah (Queensland) | 25 | 26 | | 142 | 36 | | 390 | 119 |
| OCEANIA. | | | | | | | | |
| *Apia (Samoa) | 13 | 48 | S. | 171 | 46 | W. | 16 | 5 |
| *Alofi (Niue Is.) | 19 | 2 | | 169 | 55 | | 121 | 37 |
| *Chatham Island | 43 | 52 | | 170 | 42 | | 190 | 58 |
| *Fanning Island | 3 | 55 | N. | 159 | 23 | | 13 | 4 |
| Gomen (New Caledonia) | 20 | 21 | S. | 164 | 10 | E. | ? | ? |
| *Guam (Ladrones Is.) | 13 | 20 | N. | 144 | 35 | | 12 | 4 |
| *Lord Howe Island | 31 | 32 | S. | 159 | 4 | | ? | ? |
| *Malden Island | 3 | 59 | | 155 | 00 | W. | 26 | 8 |
| *Mataveri (Easter Is.) | 27 | 10 | | 109 | 26 | | 98 | 30 |
| *Norfolk Island | 29 | 4 | | 167 | 58 | E. | ? | ? |
| *Noumea (New Caledonia) | 22 | 16 | | 166 | 27 | | 30 | 9 |
| *Ocean Island | 0 | 52 | | 169 | 36 | | 92 | 28 |
| *Rarotonga (Cook Is.) | 21 | 12 | | 159 | 47 | W. | ? | ? |
| *Rendova (Solomon Is.) | 8 | 24 | | 157 | 19 | E. | ? | ? |
| *Suva (Fiji) | 18 | 8 | | 178 | 26 | | 13 | 4 |
| *Tahiti (Low Arch.) | 15 | 47 | | 148 | 14 | W. | 154 | 47 |
| *Tulagi (Solomon Is.) | 9 | 5 | | 160 | 8 | E. | 6 | 2 |
| *Uyelang | 9 | 42 | N. | 161 | 2 | | 33 | 10 |
| *Yap | 9 | 29 | | 138 | 8 | | 105 | 32 |
| AFRICA. | | | | | | | | |
| *Accra (Brit. Guinea) | 5 | 35 | N. | 0 | 6 | W. | 59 | 18 |
| Addis-Abeba (Abyssinia) | 9 | 1 | | 38 | 43 | E. | 7874 | 2400 |
| *Alexandria (Egypt) | 31 | 9 | | 29 | 54 | | 105 | 32 |
| *Algiers (Algeria) | 36 | 47 | | 3 | 4 | | 125 | 38 |
| *Aswan (Egypt) | 24 | 2 | | 32 | 53 | | 328 | 100 |
| *Bathurst (Gambia) | 13 | 24 | | 16 | 36 | W. | 16 | 5 |
| Bengazi (Tripoli) | 32 | 7 | | 20 | 2 | E. | 30 | 9 |
| Bizerte (Tunis) | 37 | 17 | | 9 | 50 | | 30 | 9 |
| Bulawayo (South Rhodesia) | 20 | 10 | S. | 28 | 40 | | 4469 | 1362 |
| Cairo (Egypt) Abassia Observatory | 30 | 4 | N. | 31 | 17 | | 108 | 33 |
| *Cairo (Egypt) Helwan | 29 | 52 | | 31 | 20 | | 380 | 116 |
| *Cape Coast Castle (Brit. Guinea) | 5 | 5 | | 1 | 13 | W. | ? | ? |
| Cape Spartel (Morocco) | 35 | 47 | | 5 | 55 | | 191 | 58 |
| *Cape Town (Cape Colony) | 33 | 56 | S. | 18 | 29 | E. | 30 | 9 |
| *Casablanca (Morocco) | 33 | 37 | N. | 7 | 35 | W. | 56 | 17 |
| Ceres (Cape Colony) | 33 | 22 | S. | 19 | 20 | E. | 1493 | 455 |
| *Conakry (Fr. Guinea) | 9 | 31 | N. | 13 | 43 | W. | 52 | 16 |
| Constantine (Algeria) | 36 | 22 | | 6 | 37 | E. | 2165 | 660 |
| *Dakhla Oasis (Egypt) | 25 | 30 | | 29 | 00 | | 426 | 130 |
| *Dar-es-Salaam (Tanganyika Territory) | 6 | 49 | S. | 39 | 18 | | 26 | 8 |
| *Durban (Natal) | 29 | 51 | | 31 | 00 | | 262 | 80 |

## LIST OF METEOROLOGICAL STATIONS.

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| AFRICA. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| *East London (Cape Colony) | 33° | 2′ S. | 27° | 55′ E. | 33 | 10 |
| El-Djem (Algeria) | 35 | 21 N. | 10 | 38 | 541 | 165 |
| *El Obeid (Brit. Sudan) | 13 | 11 | 30 | 14 | 1919 | 585 |
| *Entebbe (Brit. East Africa) | 0 | 5 | 32 | 29 | 3862 | 1177 |
| Fort Napier (Natal) | 29 | 36 S. | 30 | 23 | 2200 | 671 |
| Fort National (Algeria) | 36 | 38 N. | 3 | 72 | 3051 | 930 |
| Geryville (Algeria) | 33 | 41 | 1 | 00 | 4281 | 1305 |
| Grahamstown (Cape Colony) | 33 | 18 S. | 26 | 32 | 1800 | 540 |
| *Gwelo (South Rhodesia) | 19 | 27 | 29 | 49 | 4646 | 1416 |
| *Harrar (Abyssinia) | 9 | 42 N. | 42 | 30 | 6089 | 1856 |
| *Heidelberg (Transvaal) | 34 | 5 S. | 20 | 58 | 5056 | 1541 |
| *Insalah (Sahara) | 27 | 17 N. | 2 | 27 | 1083 | 330 |
| Ismailia (Egypt) | 30 | 36 | 32 | 16 | 30 | 9 |
| *Johannesburg (Transvaal) | 26 | 11 S. | 28 | 4 | 6148 | 1874 |
| *Kadugli (Brit. Sudan) | 11 | 2 N. | 29 | 45 | 1650 | 503 |
| *Kafia Kingi (Brit. Sudan) | 9 | 22 | 24 | 18 | 1955 | 596 |
| *Katagum (Nigeria) | 12 | 17 | 10 | 22 | 102 | 31 |
| Kenilworth (Kimberley) | 28 | 42 S. | 24 | 27 | 3950 | 1204 |
| *Khartoum (Egypt) | 15 | 37 N. | 32 | 33 | 1309 | 390 |
| *Kimberley (Cape Colony) | 28 | 43 S. | 24 | 46 | 4042 | 1232 |
| *Kontagora (Nigeria) | 10 | 24 N. | 5 | 24 | 1312 | 400 |
| Laghouat (Algeria) | 33 | 48 | 2 | 53 | 2559 | 780 |
| *Lagos (Nigeria) | 6 | 22 | 3 | 28 | 26 | 8 |
| *Lamu (Brit. East Africa) | 2 | 16 S. | 40 | 54 | 10 | 3 |
| *Libreville (Fr. Congo) | 0 | 23 N. | 9 | 26 | 115 | 35 |
| *Loango (Fr. Congo) | 4 | 38 S. | 11 | 50 | ?164 | ?50 |
| *Lorenzo Marques (Port. East Africa) | 25 | 58 | 32 | 36 | 194 | 59 |
| *McCarthy Is. (Gambia) | 13 | 42 N. | 14 | 46 W. | 13 | 4 |
| *Maiduguri (Port. East Africa) | 11 | 48 | 13 | 12 E. | 1214 | 370 |
| *Mauritius (Royal Alfred Observatory) | 20 | 6 S. | 57 | 33 | 177 | 54 |
| Mayumba (Fr. Congo) | 3 | 23 | 10 | 31 | 200 | 61 |
| Mojunga (Madagascar) | 15 | 45 | 46 | 19 | 134 | 41 |
| Mozambique (East Africa) | 15 | 00 | 40 | 44 | 13 | 6 |
| *Nairobi (Brit. East Africa) | 1 | 18 | 36 | 59 | 5446 | 1660 |
| *Nandi (Brit. East Africa) | 0 | 2 N. | 35 | 5 | 6594 | 2010 |
| Oran (Algeria) | 35 | 42 | 0 | 39 W. | 174 | 53 |
| Ouargla (Algeria) | 31 | 55 | 4 | 70 E. | 407 | 124 |
| Port Elizabeth (Cape Colony) | 33 | 58 S. | 25 | 37 | 181 | 55 |
| Port Saïd (Egypt) | 31 | 16 N. | 32 | 19 | 14 | 4 |
| Porto Novo (Dahomey) | 6 | 28 N. | 2 | 40 | 65 | 20 |
| *Pretoria (Transvaal) | 25 | 45 S. | 28 | 11 | 5170 | 1576 |
| Queenstown (Cape Colony) | 31 | 54 | 26 | 52 | 3500 | 1067 |
| St. Denis (Réunion) | 20 | 51 | 55 | 30 | 102 | 31 |
| *St. Helena | 15 | 57 | 5 | 40 W. | 2073 | 632 |
| St. Louis (Senegal) | 16 | 1 N. | 16 | 31 | 6 | 2 |
| St. Paul de Loanda (Angolo) | 8 | 47 S. | 13 | 13 E. | 194 | 59 |
| *St. Vincent (C. Verde Is.) | 16 | 54 N. | 25 | 4 W. | 36 | 11 |
| *Sainte-Croix-des-Eshiras (Fr. Congo) | 1 | 44 S. | 10 | 21 E. | 640 | 195 |
| *Salisbury (Rhodesia) | 17 | 49 | 31 | 3 | 4878 | 1487 |
| *San Tiago (C. Verde Is.) | 14 | 54 N. | 23 | 31 W. | 112 | 34 |
| *Ségou (Fr. West Africa) | 13 | 34 | 6 | 17 | ?892 | ?272 |
| *Sierra Leone (Sierra Leone) | 8 | 30 | 13 | 9 | 223 | 68 |
| *Sokoto (Nigeria) | 13 | 2 | 5 | 14 E. | 1161 | 354 |
| *Suez (Egypt) | 29 | 57 | 32 | 32 | 10 | 3 |
| *Tamatave (Madagascar) | 18 | 9 S. | 49 | 26 | 13 | 4 |
| *Tananarivo (Madagascar) | 18 | 55 | 47 | 43 | 4593 | 1400 |

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| AFRICA. (*Continued.*) | Latitude. | | Longitude from Greenwich. | | Height. Feet. | Height. m. |
|---|---|---|---|---|---|---|
| Tangier (Morocco) | 35° | 47′ N. | 5° | 49′ W. | 246 | 75 |
| *Timbuctoo (Fr. West Africa) | 16 | 43 | 2 | 52 | 820 | 250 |
| *Tunis (Tunis) | 36 | 48 | 10 | 10 E. | 141 | 43 |
| Upper Sheikh (East Africa) | 9 | 56 | 45 | 11 | 4593 | 1400 |
| Vivi (Congo) | 5 | 40 S. | 13 | 49 | 364 | 111 |
| *Wadi Halfa (Egypt) | 21 | 55 N. | 31 | 20 | 420 | 128 |
| *Wau (Brit. Sudan) | 7 | 42 | 28 | 3 | 1444 | 440 |
| *Windhoek (South-West Africa) | 22 | 34 S. | 17 | 5 | 5463 | 1665 |
| *Yola (Nigeria) | 9 | 12 N. | 12 | 30 | 850 | 259 |
| *Zanzibar (Brit. East Africa) | 6 | 10 S. | 39 | 11 | 73 | 22 |
| *Zomba (Nyasaland Prot.) | 15 | 23 | 35 | 18 | 2949 | 899 |
| *Zungeru (Nigeria) | 9 | 48 N. | 6 | 10 | 426 | 130 |
| ARCTIC AND ANTARCTIC. (*See also* GREENLAND, ICELAND, RUSSIA, etc.) | | | | | | |
| Bossekop | 69 | 57 N. | 23 | 15 E. | ? | ? |
| *Cape Evans (McMurdo Sound) | 77 | 38 S. | 166 | 24 | 59 | 18 |
| *Cape Pembroke | 51 | 41 | 57 | 42 W. | 69 | 21 |
| Dicksonhavn | 73 | 30 N. | 81 | 00 E. | ? | ? |
| Fort Rae | 62 | 39 | 115 | 44 W. | ? | ? |
| *Framheim | 78 | 38 S. | 163 | 37 | 36 | 11 |
| Jan Mayen | 70 | 59 N. | 8 | 28 | ? | ? |
| Kingua-Fjord (Cumberland Sound) | 66 | 36 | 67 | 9 | ? | ? |
| Lady Franklin Bay | 81 | 44 | 64 | 45 | ? | ? |
| Novaya Zemlya | 72 | 30 | 52 | 45 E. | ? | ? |
| Orange Bay | 55 | 31 S. | 70 | 25 W. | ? | ? |
| Point Barrow | 71 | 23 N. | 156 | 40 | ? | ? |
| Sagastyr | 73 | 23 | 124 | 5 E. | ? | ? |
| *Spitsbergen | | | | | | |
| Advent Bay | 78 | 2 | 15 | 6 | 590 | 180 |
| Green Harbour | 78 | 2 | 14 | 14 | 36 | 10 |
| *South Georgia | 54 | 14 S. | 36 | 33 W. | 13 | 4 |
| *South Orkneys | 60 | 44 | 44 | 39 | 23 | 1 |

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