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THE

FIELD PRACTICE

OF

LAYING OUT CIRCULAR CURVES

FOR

RAILROADS.

BY JOHN C. TRAUTWINE, CIVIL ENGINEER.

HIRD EDITION, REVISED.

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1853.

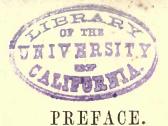


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I HAVE been induced to prepare this little volume almost entirely with reference to the wants of the many young men who desire to qualify themselves for field service in an Engineer Corps. On that account, I have endeavored, by the use of the plainest language, to render the subject intelligible to *them*,—dispensing with that mathematical brevity which would have better accorded with the requirements of those who have already attained to some degree of proficiency in elementary field operations. Still, I trust that it will not prove unacceptable even to the latter.

The Table of Natural Sines and Tangents to single minutes, in a form sufficiently portable for field use, will supply a want which I have myself frequently experienced, not only in the operation of laying out curves, but on many other occasions.

One object in preparing it, was to furnish the profession with a Table that should be not only portable, but absolutely reliable. Those whose occupations compel them to resort to the Tables in common use, must have frequently experienced, like myself, the extreme embarrassment which attends the inaccuracies to which they are all So long as a Table is known to contain a single error, the subject. position of which is not ascertained, its employment is attended with doubt in every instance in which we are obliged to refer to it. On this account, I have not only prepared these Tables with the most scrupulous care, while in common type, but in order to render their accuracy a matter of certainty, I had them stereotyped, and afterwards revised three times with the utmost caution. I therefore feel no hesitation in saying that they may be depended upon absolutely. The same remark applies to the other Tables contained in the volume.

As Hassler's and Hutton's Tables of Natural Sines and Tangents are those most in use among the profession, it will be desirable to those persons who possess them, to be able to correct the following errors, which I detected in comparing them.

In Hutton's Tables, Fifth Edition, 1811. Sine of 6° 8', for '1063425, read '1068425. Page 328, at top, for 25 Deg., read 40 Deg. Tangent of 44° 60', for '1000000, read 1.000000. Tangent of 41° 60', for '8994040, read '9004040.

In Dr. Gregory's Corrected Edition (the 8th) of Hutton's Tables, 1838 Sine of 49° 14′, for '7576751, read '7573751.

In Hassler's Tables, 1830.

Sine of 78° 24', read .9795752. Sine of 20° 60′, 66 ·3583679. Sine of 66° 19', 66 ·9157795. Sine of 56° 39'. " ·8353279. Sine of 55° 20', \$6 ·8224751. Sine of 53° 4', 66 ·7993352. Sine of 48° 12', 66 ·7454760. Sine of 45° 3', " ·7077236.

The foregoing I believe to be all the errors in the Natural Sincs and Tangents to *whole* minutes, in the respective tables. The discrepancies of 1 in the 7th decimal, I have not considered as errors, as they are occasioned by a neglect of the value of the 8th decimal. For calculating curves, it is not necessary to use more than 4 decimals.

It is scarcely necessary to remark that, beyond 44° , the Sines, Fangents, &c. are read *upwards*, from the bottom of the page, using the corresponding column of minutes. To find the sine of an angle exceeding 90°, subtract the angle from 180°, and take out the sine of the remainder—because the sine of an angle, and that of what t wants of 180°, are the same.

In this edition the Tables of Radii and Ordinates have been extended.

JOHN C. TRAUTWINE.

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FOR.

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ARTICLE I.

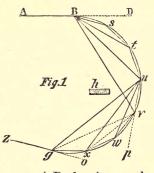
PRINCIPLES OF LAYING OUT CURVES.

METHOD 1.

To lay out a Curve by means of Tangential Angles.

IF from any point B, fig. 1, in a straight line A D, we lay off any number of equal angles, as D B s, s B t, t B u, u B v, &c., and at the same time make the chords B s, st, tu, uv, &c. equal to each other, then the points B, s, t, u, v, &c. will be situated in the circumference of a circle, which is tangential to the line A D at the point B.

The first of these angles, Z. DBs, is called the tangential angle, as being that by which



the curve is connected with the tangent A D; but inasmuch as the others are all equal to it, they also are called tangential angles.

If any obstacle, as h, should prevent our seeing from B farther than to v, the curve may be continued by removing

the instrument to u, the point preceding v; thence sighting first on v, continue to lay off additional tangential angles v u w, w u x, &c., as before. Or else, moving the instrument to v itself instead of to u, sight back to u, and lay off first the exterior angle p v w, equal to *double* the tangential angle, and afterward continue the tangential angles w v x, x v g, &c., as before, to the end of the curve.

Finally, in order to pass from the end of the curve at g, on to a tangent g z, place the instrument at g, and sighting back to x, lay off the tangential angle x g o; then o g continued toward z will be the required tangent. (See Art. IV.)

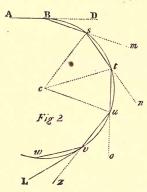
For the tangential angles corresponding to different radii, and chords of 100 feet, see page 25.

ARTICLE II.

METHOD 2.

To lay out a Curve by means of Deflection Angles.

Fig. 2. First, having, as in method 1, laid off a tangen-



in method 1, laid of a tangential angle D B s, and measured the chord B s, remove the instrument to the end s of the chord, and make the exterior angle m s t equal to *twice* the tangential angle, and measure the chord s t; and so on at the other points t, u, v, &c., making each of the exterior angles n t u, o u v, &c. equal to twice the tangential angle, and all the chords equal; then will the points B, s, t, u, v, &c. be in the circumference of a circle which is tan-

gential to the line A D at the point B, as by the first method.

But if, at any of these points, as v, we wish to pass off to a tangent v L, employ at that point the *tangential* angle z v L, equal to half the deflection angle z v w. (See Art. IV.)

These exterior angles, included between any chord and the extension of the preceding chord, are called deflection angles, or angles of deflection, or angles of curvature. In any given circle, the angle of deflection is always precisely double the tangential angle, supposing the chords to be equal. At page 25, we give tables of the angles corresponding to circles of different radii, embracing the limits of railroad practice; and calculated for chords 100 feet in length, that being the usual length for a measuring chain on public works.

N. B. The deflection angle of any curve is equal to the angle t c u, or t c s, &c. at the centre of the circle, subtended by one of the equal chords t u or t s. This angle at the centre, so subtended, is called the central angle. The tangential angle, being always half the deflection angle, is, of course, always half the central angle.

ARTICLE III.

METHOD 3.

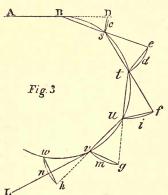
To lay out a Curve by Eye.

The deflection angles, fig. 3, est, ftu, guv, hvw, &c., being double, the tangential angle D B s, the arcs e d t, A f i u, g m v, h n w, &c., aredouble the arc D c s, since the arcs of circles are proportionate to the angles which they subtend; but the chords et, fu, gv, hw, &c. are notdouble the chord D s, since the chords of arcs are not proportionate to the arcs, or to the angles which they subtend.

The chords e t, f u, g v, h w, &c., which subtend the deflection angles, are called

deflection distances; and the chord D s, which subtends the tangential angle, is called the tangential distance.

But although, in any given circle, the deflection distance is not truly twice the tangential distance, yet the difference



is so triffing in large railroad curves, with chords of but 100 feet, that it may generally be neglected in curves of more than 300 feet radius.

In our tables the *precise* length of both will be found for different radii, and for chords of 100 feet.

Having these respective distances, we may frequently trace a curve on the ground by the eye only, with very tolerable accuracy, sufficient for guiding the excavations and embankments, especially on nearly level ground. Suppose, for instance, it be required to lay out in this manner a curve of 5730 feet radius.

First, find by the table, page 25, or by Art. XVI, the deflection distance et or fu, &c., corresponding to a radius of 5730 feet for a chord of 100 feet, viz. 1.745 feet; and also the tangential distance $ds \cdot 873$ of a foot.

Then from the starting point B, and in line with A B, measure B D equal 100 feet; and put a pin at D. Also from B, measure the chord B s, equal 100 feet; at the same time measuring with a graduated rod, from the pin D, the *tangential* distance D s, equal to \cdot 873 of a foot; and place a stake at s. The pin at D may then be removed.

Next, make s e equal 100 feet, placing a pin at e, precisely in line with s B; also from s measure s t equal 100 feet; at the same time measuring with the rod from the pin e, the *deflection* distance e t, equal to 1.745 feet. Place a stake at t, and remove the pin at e. In this manner proceed to find other points as far as the end of the curve at v.

In order to pass from the curve, as at v, to a tangent v L, proceed as before, only using the tangential distance h n, instead of the deflection distance h w. (See Art. IV.)

This method is abundantly accurate for laying out curves on a canal, or common road; and will occasionally answer very well, when carefully performed, for railroad curves, in the absence of an instrument. Thin straight rods, ironpointed, and a plumb line should be used for ranging the points in the latter case.

The transit instrument is the best for tracing curves, and running lines generally. I prefer the graduations to run from the same zero, right and left, to 180° each way. There should be two verniers, graduated to minutes; by their means half, or even quarter minutes may generally be estimated with considerable certainty. The telescope revolving in a vertical plane, greatly expedites the laying off of exterior angles, after having first sighted backward to the point behind.

The verniers are sometimes graduated to hundredths of a degree; and this division is, in certain cases, the best; but for *general* purposes, the division into minutes is to be preferred, as all the printed tables of sines, tangents, &c., are calculated for that division.

ARTICLE IV.

On Sub-Chords.

We have hitherto spoken of curves as if they were composed of equal chords, each of 100 feet in length. It frequently happens, however, that at the end of a curve, as

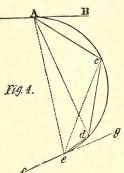
at e, fig. 4, we are obliged to use a shorter, or sub-chord d e, in order to unite properly with the tangent e f.

In that case, and when using Method 1., Art. I., of laying off curves by means of tangential angles, we must, in order to fix the point e, lay off a sub-tangential angle d A e, as much smaller than the entire tangential angle B A c, or c A d, &c., as the sub-chord d e is smaller than an entire 100 feet chord, a c, c d, &c. Thus if the

sub-chord be one-half, or one-fourth, &c. of the entire chord, the sub-tangential angle must be one-half, or onefourth, &c. of the entire tangential angle.

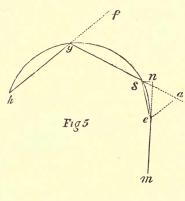
This method is not mathematically exact, for the reason stated in Art. III. (viz. that the *chords* subtending different angles are not proportional to those angles;) yet, for curves of 300 or more feet radius, and with chords not exceeding 100 feet in length, the error is not observable in practice.

In like manner, when we pass off from a sub-chord, as at e, to a second tangent, e f, we must place the instrument at e, and lay off the same sub-tangential angle d e g; or which is better, take sight from e to c, and lay off the angle c e g, equal to the sum of a tangential and the sub-tangential angle.



But when using Method 2, Art. II. of deflection angles, or Method 3, Art. III. of deflection distances, we may calculate the sub-deflection angle, a s e, fig. 5, and sub-deflection distance a e, formed between a sub-chord s e, and the extension s a, of an entire chord g s, with sufficient accuracy for curves of 300 or more feet radius, and chords of not more than 100 feet, thus:

Rule.—Say, as an entire chord of 100 feet is to the subchord s e, so is the *deflection* angle of the curve, to a certain angle. Add these two angles together and divide their sum by 2, for the sub-deflection angle $a \ s e$, of the sub-chord.



Example.—The curve, fig. 5, has a radius of 319.6 feet, and an angle of deflection, fgs, of 18° for chords of 100 feet. The sub-chord $s \ e$ is 25 feet in length; what is the z sub-deflection angle $a \ s \ e$; and also the sub-deflection distance $a \ e$, for the subchord $s \ e$?

Here, as 100 is to 25, Def. An. of Certain

So is 100 ft. chord. Angle. $4^{\circ} 30'$.

The sum of these two angles, 18° and $4^{\circ} 30' = 22^{\circ} 30'$, the half of which is $11^{\circ} 15'$, the required sub-deflection angle *a s e*.

Again, to find the sub-deflection distance a e, of the subchord s e; take from the table of sines, the natural sine of *one-half* the sub-deflection angle a s e, just found. Multiply this natural sine by 2, and multiply that product by the length of the sub-chord.

Example.—The sub-deflection angle is 11° 15'; one-half of it is 5° $37\frac{1}{2}$ ', the tabular natural sine of which is $\cdot 0979$, which multiplied by 2, gives $\cdot 1958$; and this multiplied by the sub-chord, 25 feet, gives $4 \cdot 895$ feet, the required sub-deflection distance *a e*.

Finally, to find the sub-tangential distance s n, by means of which to pass from e to the tangent e m, say, as 10000 is to the square of the sub-chord in feet; so is the *tangential* distance for a 100 feet chord, to s n. In this instance, we have as 10000 is to 625, so is 15.69 feet to .980 feet, or s n.

ARTICLE V.

Ordinates for Entire Chords.

It would be both tedious, and liable to inaccuracy, to attempt to fix all the necessary points in railroad curves by the foregoing means, which are employed only for entire chords, or for such sub-chords as may be required at the ends of curves.

The best method is to stretch a piece of twine a b, fig. 6, 100 feet long, between two ad-

jacent chord-stakes, and measure off as nearly as may be at right angles to it, with a graduated rod, the previously

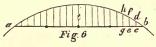
calculated ordinates, c d, e f, g h, &c., placing pegs at d, f, h, &c.* Our table of ordinates, page 28, is calculated for distances apart b c, c e, e g, &c., of 5 feet; and for all curves likely to occur in practice. The 5 feet distances on the twine should be marked by knots or otherwise; and those at the center, and half way between it and the ends, be further distinguished by tying on pieces of tape.

The 5 feet distances are only used (after the excavations and embankments are finished) for placing pegs to guide the laying of the rails, and then only for very sudden curves; for those of large radii, distances of 10 feet are quite sufficient, or even 25 feet for very easy curves. For guiding the curves of the cuttings and fillings, it is not necessary to place the stakes nearer than 50 feet apart; unless for those of less than about 1000 feet radius, when they may be placed 25 feet apart. Ordinates for radii intermediate of those in the table, may either be calculated by the rules given further on; or they may be taken proportionally intermediate of the tabular ones, with sufficient accuracy for practice.

Ordinates for Sub-Chords.

These may readily be calculated approximately enough

* On the tops of these stakes, small tacks are driven to define the precise point in the curve.



for railroad practice, for curves of over 300 feet radius, and for chords not exceeding 100 feet, thus: In a circle of given radius, not less than about 300 feet, the ordinates of an entire 100 feet chord may be assumed to be to those of a sub-chord, as the square of the chord is to the square of the sub-chord.

In all our tables the chord is supposed to be 100 feet, the square of which is 10000; the rule therefore becomes, as 10000 feet : to square of sub-chord in feet ;: Ord. of Chord : Ord. of Sub-chord *approximately*.

Example.—In a curve of 5730 feet radius, the middle ordinate of a 100 feet chord is $\cdot 218$ of a foot; what will be the length of the middle ordinate of a sub-chord of 50 feet? Here,

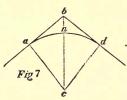
Sq. of 100 ft. : Sq. of 50	ft. : :	Mid. Ord. of Chord.	:	Mid. Ord. Sub-Chord approximately,
10000 : 2500	::	•218 ft.	:	·0545 ft.

And so of any other ordinate, always supposing the chord and sub-chord to be divided into the same number of parts.

ARTICLE VI.

Having given the angle a b d, fig. 7, it is required to find the point a or d, at which to commence a curve of given radius.

Rule.—Subtract half the angle $a \ b \ d$ from 90°; the re-



mainder will be the angle b c a, or b c d. From the table of tangents take the natural tangent of b c a, and multiply it by the given radius; the product will be b a, or b d.

Example.—Let the angle $a \ b \ d$ be 120°, how far from b must we begin, at a or d, to lay out a curve dius?

a n d, of 2865 feet radius?

Here, half of the angle $a \ b \ d = 60^{\circ}$, which taken from 90° leaves the angle $b \ c \ a = 30^{\circ}$. The natural tangent of $30^{\circ} = \cdot5773$, which multiplied by the radius of 2865 feet, gives 1653.96 feet for $b \ a \ or \ b \ d$. (See Art. XII.)

ARTICLE VII.

Having given the angle a b d, fig. 7, and the distance from b to a or d, at one of which we wish to commence a curve, it is required to find what radius a c or c d, the curve must have, in order to unite with b a and b d tangentially at a and d.

Rule.—Subtract the angle $a \ b \ c$, which is half the angle $a \ b \ d$, from 90°; the remainder will be the angle $b \ c \ a$, or $b \ c \ d$. Then as nat. sine of $b \ c \ a$,* is to nat. sine of $a \ b \ c$,† so is $a \ b \ to \ a \ c$, the radius required.

Example.—Let the angle $a \ b \ d$ be 120°, and the distance $b \ a$ or $b \ d$ 1654 feet; what will be the radius $a \ c$ or $c \ d$ of a circle that shall touch a and d tangentially.

Here the angle $a \ b \ c =$ half the angle $a \ b \ d$, is 60°, which taken from 90°, leaves the angle $b \ c \ a$, or $b \ c \ d =$ 30°. Then as the nat. sine of $b \ c \ a \ (30°) = \cdot 5000$ is to nat. sine of $a \ b \ c$, (60°) = $\cdot 8660$, so is $b \ a \ (1654 \ \text{feet})$ to $a \ c$, (2865 feet,) the radius required.

ARTICLE VIII.

Having given the radias a c, fig. 7, of a curve, and the angle a b d, it is required to find the number of chords of 100 feet that will constitute the curve.

Rule.—Subtract the angle $a \ b \ d$ from 180°, and divide the remainder by the angle of curvature, or deflection of the curve. The quotient will be the required number of chords.

Example.—Let the angle $a \ b \ d$ be 120°, and the radius $a \ c$, 2865 feet.

Here the angle $a \ b \ d$, 120°, subtracted from 180°, leaves a remainder of 60°; which, divided by 2°, the angle of deflection for a curve of 2865 feet, gives a quotient of 30; which is the required number of chords of 100 feet.

N. B.—Had the quotient contained a *fraction* of a chord, it would have indicated that we should have had to employ a sub-chord at the end of the curve; for instance, had the number of chords been $30\frac{1}{2}$, a sub-chord of 50 feet (very approximately) would have been necessary.

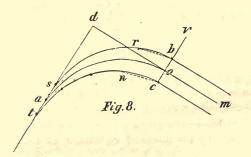
* The angle opposite the given side, a b.

† The angle opposite the required side, a c.

ARTICLE IX.

How to proceed when the end of a curve does not correctly join the tangent.

We sometimes find, in running out a curve for the number of chords determined by the Rule in the preceding Article, that instead of uniting as it should with the previously determined tangent d m, fig. 8, at o, it ends tangentially to a line *parallel* to said tangent, either *within* it, as at c; or *beyond* it, as at b. Being first certain that no error has occurred in tracing out the curve, ascertain with the compass the bearing of the tangent a d, and, removing the compass to the end of the curve at c or b, (as the case may be,) run the line b o or c o, in the same course as a d, until it strikes the tangent d o m; which may be ascertained by ranging two stakes placed on the tangent.



Then measure b o, or c o, (as the case may be,) and if the curve fall within the tangent o m, as at c, measure forwards from t towards d, the distance t a, equal to c o; or if the curve fall beyond the tangent, as at b, measure backwards from s, the distance s a equal to b o. Then the curve retraced from a, will terminate tangentially in d m at o.

N. B.—The direction of c o or b o may be ascertained without a compass, and better, thus: Multiply the *tangential* angle of the curve by *twice* the number of chords run, *less* one; subtract the product from 180°, and sighting back one chord to n or r, lay off the angle n c b, or r b v, equal to the remainder. For example, if the tangential angle be 10°, and from t to c be 4 chords, then 7 times 10° taken from 180° leaves the angle n c b, or $r b v = 110^{\circ}$. When the product exceeds 180°, it must be subtracted from 360°, for the angle n c b, or r b v.*

This case occurs whenever an error has been made in measuring the distance from d to a. If d a be made too short, the curve s b is the result; and if too long, the curve t c.

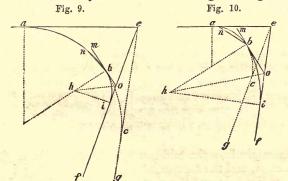
If the error is small, it may be divided equally among the chords by measure, without retracing the curve with an instrument. This method may be employed with perfect security so long as the error does not exceed 1 foot to every chord of 100 feet; and it will never be so great if moderate care be taken.

Thus, if the curve be 20 chords long, and the error 20 feet, the last stake may be moved 20 feet, the next 19, the next 18, &c., as nearly at right angles to the curve as can be judged by the eye.

The same ordinates that would have been used had the curve been correct, will answer for the one so adjusted, without perceptible difference. For other cases, see Art. X.

ARTICLE X.

Again, it may happen that the error is not caused by a mismeasurement of the distance $a \ e$, figs. 9 and 10, as in the last case; but by mistake in obtaining the angle $a \ e \ f$.



If a e f, fig. 9, be measured in excess, as a e g, then the

* In both cases the angle is measured *outwardly* from the curve; but when the curve falls beyond the tangent, as at b, then b v must be continued inwardly as b o. curve a b c, calculated for the incorrect angle a eg, will be found to fall beyond the true tangent ef, as at c; and the tangents eg and ef not being parallel, the curve cannot be adjusted by either of the methods given in the preceding Article, unless the error be within about 1 foot to each 100 feet length of the curve; in which case, (supposing no other error to exist,) either of those methods may be employed, with sufficient accuracy for practice.

Also, if a e f, fig. 10, be measured too small, as a e g, then the curve a b c, calculated for the incorrect angle a e g, will be found to fall within the true tangent e f, as at c; when so, the remarks contained in the preceding sentence are equally applicable here. If the error be within 1 foot to 100 feet length of curve, it may be equally divided among the chords. But if greater, we must either remeasure the angle a e fcorrectly, and go over the whole work again, or resort to some other mode of obviating the difficulty. The angle a e f may be difficult of access; or the curve may be so long that to retrace it would be a work of much labor. We may then adopt the method of compound curves, (see Art. XIII.,) by which much trouble will be avoided, and a considerable portion of the first part of the curve be allowed to remain as it is.

Thus, whether the curve $a \ b \ c$ fall beyond the true tangent $e \ f$, as in fig. 9, or inside of it, as in fig. 10, place the instrument at b, figs. 9 and 10, (the point at which the change of radius is to take place,) and sighting back one chord to n, lay off the tangential angle $n \ b \ m$ of the curve $a \ b \ c$, and observe where the tangent $m \ b$ continued, strikes $e \ f$, as at o. Measure both $b \ o$, and the angle $b \ o \ f$. Half the angle $b \ o \ f$ taken from 90°, gives the angle $b \ h \ o$; then say,

As the $\begin{cases} Nat. Sine of angle b h o op$ $posite the given side, b o, \end{cases}$ is to $\begin{cases} Nat. Sine of angle b o h opposite the required side b h, \\ So is The given side b o, to The required side, or new radius b h. \end{cases}$

Ascertain from the table, or by calculation, the angle of deflection, and the tangential angle corresponding to this new radius b h; and the new curve commencing at b will terminate tangentially to e f at i, as far from o as o is from b.

For the mode of uniting two curves of different radii, so as to form a *compound* curve, see Article XIII. It will be observed, that when the first curve, $a \ b \ c$, fig. 10, falls *inside* the tangent $e \ f$, the new curve must be of *greater* radius; and when *beyond* fig. 9, of a *less* one.

ARTICLE XI.

Having given the angles a b c and b c d, fig. 11, and the distance b c, it is required to find the greatest radius, g i, or h i, that can be employed in a REVERSE curve, (see Article XIV) f o i n m, for uniting a b to c d.

Rule.—Half the angle $a \ b \ c$ taken from 90°, leaves the angle $b \ g \ i$; and half the angle $b \ c \ d$ taken from 90°, leaves the angle $i \ c \ d$ taken from 90°, leaves the angle $i \ h \ c$.

From the table of tangents take the natural tangent (b i) of the angle b g i; and that (i c) of the angle i h c; and add them together.

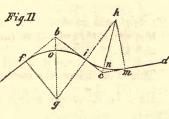
Then as the sum of these two nat. tangents is to the nat. tang. of b g i, so is b c to b i; and b i taken from b c, gives i c.

Again, in the triangle bg i, as the nat. sine of the angle bg i, opposite the given side bi, just found, is to the nat. sine of the angle g bi, opposite the required side gi, so is bi, the given side, to gi, the required side or radius.

Example.—Let the angle a b c be $71^{\circ} 40'$, the angle b c d129° 15', and the distance b c 950 feet. What is the length of radius h i or g i, of the easiest reverse curve that can be traced for uniting a b to c d?

Here, half the angle $a b c (35^{\circ} 50')$ taken from 90°, leaves the angle $b g i 54^{\circ} 10'$; and half the angle $b c d (64^{\circ} 37\frac{1}{2}')$ taken from 90°, leaves the angle $i h c = 25^{\circ} 22\frac{1}{2}'$.

From the table of tangents, we have nat. tang. of b g i (54° 10') = 1.3848; and nat. tang. of $i h c (25° 22\frac{1}{2}') =$ 4743; their sum being 1.8591.



2*

Then as

$$\begin{array}{c} \text{Sum of Tang's.} \\ 1\cdot8591 \end{array} \right\} \text{is to} \left\{ \begin{array}{c} \text{Tang. of} \\ 54^\circ \ 10' \\ 1\cdot3848, \end{array} \right\} \text{so is} \left\{ \begin{array}{c} b \ c \\ 950 \ \text{ft.} \end{array} \right\} \text{ to } \left\{ \begin{array}{c} b \ i \\ 707\cdot63 \ \text{ft.} \end{array} \right\} \end{array}$$

and b i, 707.63 feet, taken from b c, 950 feet, leaves i c 242.37 feet.

Again, as the

 $\begin{array}{c} \text{Nat. Sine} \\ \text{of angle} \\ b \ g \ i \\ \cdot \$107 \end{array} \right\} \text{ is to } \left\{ \begin{array}{c} \text{Nat. sine of} \\ \text{Angle} \ g \ b \ i \\ \cdot \$5\$54, \end{array} \right\} \text{ so is } \left\{ \begin{array}{c} b \ i \\ 707 \cdot 63 \\ \text{feet} \end{array} \right\} \text{ to } \left\{ \begin{array}{c} g \ i \ or \ h \ i, \text{ the} \\ required \ raddius, \ 510 \cdot 97 \\ \text{feet} \end{array} \right\}$

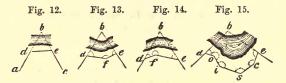
ARTICLE XII.

To obtain the angle d b e, formed by two tangents, d b, and b e, when the point b is inaccessible. Figs. 12, 13, 14, and 15.

This is of frequent occurrence.

CASE 1. When the included figure, fig. 12, has but three sides.

Rule.—Subtract the angle a d e from 180° for the angle b d e; and subtract the angle d e c from 180° , for the angle d e b. Add together b d e and d e b, and subtract their sum from 180° , for the angle d b e.



CASE 2. When the included figure, $d \ b \ ef$, figs. 13 and 14, has four sides.

Rule.—Subtract the sum of the three *internal* angles of the figure marked by dotted segments of circle, from 360° , for the angle $d \ b \ e$.

CASE 3. When the included figure, 15, has more than four sides.

Rule.—Add together all the *internal* angles, marked by dotted segments of circles; and subtract their sum from twice as many right angles as the figure has sides, less four, for the angle $d \ b \ e$.

Example.—Let the angles denoted by the dotted segments at the different letters be as follows: That at d, 70°; at o, 220°; at i, 150°; at s, 110°; at c, 160°; at e, 100°. The sum of these is 810°. The figure has 7 sides; and twice 7, less 4 = 10; and 10 right angles = 900°; from which the sum of the designated internal angles (810°) being subtracted, leaves 90°, for the angle d b e.

N. B.—When the angle d b e has to be deduced from a figure of many sides, as fig. 15, the errors spoken of in Articles IX. and X. are apt to occur, unless the several sides and the angles o, i, s, &c., be measured with much care. For tracing curves with any accuracy and satisfaction, the instrument should be divided at least into minutes; as before remarked, the transit instrument is the best for the purpose. With moderate care in the preparatory measurement of the sides and angles, errors will seldom occur that may not be adjusted with all the accuracy required in practice, by the very simple method of dividing them equally among the chords, as explained in Articles IX. and X.

ARTICLE XIII.

To pass from one curve, a m b, fig. 16, to another, b n c, of different radius, but running in the same direction, constituting a COMPOUND curve.

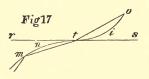
Rule.—Placing the instrument at b, sight back to the other end of the 100 feet chord at a; and lay off the tangential angle $\frac{d}{d}$ b d, of the curve a m b; then from the common tangent d b e, lay off the tangential angle e b c, of the curve b n c, making at the same time the chord b c equal to 100 feet.

N. B.—If running the curve by eye, use the tangential distances instead of the angles.

ARTICLE XIV.

To pass from one curve, m n t, fig. 17, to another, t i o, of either the same, or of a different radius, but running in an opposite direction; constituting a REVERSE curve.

Rule.—Placing the instrument at t, sight back to the



other end of the 100 feet chord at m, and lay off the tangential angle m t r, of the curve m n t; then from the common tangent r t s, lay off the tangential angle s t o, of the curve t i o; making at the same time the chord t o,

equal to 100 feet.

N. B.—If running the curve by eye, use the tangential *distances* instead of the angles.

ARTICLE XV.

RADII.

To find the radius corresponding to any given angle of deflection, and to equal chords of any given length.

Rule 1.—Subtract the angle of deflection from 180° , then say, as nat. sine of angle of deflection, is to nat. sine of *half* the remainder, so is the given chord to the radius required.

Example.—Let the angle of deflection be 2° , and the chord 100 feet, required the radius.

Here 2° subtracted from 180°, leaves 178°, the half of which is 89°, and as

Rule 2.—The radius for 100 feet chords may be found approximately, by dividing 5730 by the deflection angle.

This rule is very close for radii of not less than 500 feet. For 500 feet it gives eight-tenths of a foot too little, but is more approximate for larger radii.

Example.—What is the radius to a deflection angle of 2° , the chords being 100 feet long?

Here, 5730 divided by 2, gives 2865 feet, the radius required.

ARTICLE XVI.

TANGENTIAL AND DEFLECTION ANGLES.

To find either the Tangential or Deflection Angle corresponding to any given radius, and to equal chords of any given length.

Rule 1.—Divide half the chord by the radius; the quotient will be the natural sine of the tangential angle. Therefore, the angle corresponding to this sine, in the table of natural sines, will be the tangential angle required; and the tangential angle multiplied by 2 will give the deflection angle.

Example.—Let the radius be 2865 feet, and the chord 100 feet; what will be the tangential and deflection angles?

Here, half the chord, (50 feet) divided by the radius, (2865 feet) gives $\cdot 01745$; and the tangential angle in the table corresponding to the natural sine $\cdot 01745$ is 1°, twice which is 2°, the deflection angle required.

Rule 2.—The deflection angle for 100 feet chords may be found approximately by dividing 5730 by the radius. This is very close for curves of over 500 feet radius. For 500 feet it gives about one minute too little.

Example.—What is the deflection angle for a radius of 2865 feet, the chords being 100 each?

Here, 5730 divided by the radius 2865, gives 2°, the deflection angle required.

ARTICLE XVII.

DEFLECTION DISTANCES.

To find the Deflection Distance (exactly) for any given radius, when the chords are 100 feet long.

Rule.—Divide the constant number 10000 by the radius in feet; the quotient will be the deflection angle required.*

Example.—What is the deflection distance to a radius of 5730 feet, the chords being 100 feet long?

Here, 10000 divided by 5730 radius, gives 1.745 feet, the deflection distance required.

To find the Deflection Distance for any given radius, and for equal chords of any given length.

Rule.—Divide half the given chord by radius, the quotient will be the natural sine of one-*half* the deflection angle; and *double* this natural sine, multiplied by the chord, will give the deflection distance required. By this rule our table was prepared.

Example.—As before, what is the deflection distance to a radius of 5730 feet, the chords being 100 feet long?

Here, half the chord, (50 feet,) divided by radius, (5730 feet,) gives .008727, which is the natural sine of half the deflection angle. Now .008727, multiplied by 2, gives .017454, which, multiplied by the chord, (100 feet,) gives 1.745 feet, the required deflection distance, the same as in the preceding example.

ARTICLE XVIII.

TANGENTIAL DISTANCES.

To find the Tangential Distance corresponding to any given radius, and to equal chords of any given length.

Rule.—First find the tangential angle by Article XVI., and take from the table of natural sines, that correspond-

* Because the deflection distance to a radius of 10000 feet, with chords of 100 feet, is 1 foot; and the deflection distances for other radii increase *inversely* as the radii.

ing to one-*half* of the *tangential* angle. Then multiply *double* this sine by the given chord, for the tangential distance. By this rule our table was prepared.

Example.—Let the radius be 2865 feet, and the chords 100 feet each; what will be the tangential distance?

Here we find, by Article XVI., the tangential angle 1° for a radius of 2865 feet.

The natural sine corresponding to 30 minutes, or onehalf of this tangential angle, is, by the table of sines, $\cdot 008727$; the double of which is $\cdot 017454$, which, multiplied by the chord, or 100 feet, gives 1.745 feet for the tangential distance required.

ARTICLE XIX.

ORDINATES.

To find the Middle Ordinate to any given radius, and to any given chord.

Rule 1.—From the square of the radius subtract the square of *half* the chord; and take the square root of the remainder from the radius, for the middle ordinate.

Example.—What is the length of the middle ordinate d e, fig. 18, the radius c a being 819 feet, and the chord a b 100 feet?

Here, the square of c a (819) is 670761, and the square of a e (50) is 2500; which, being subtracted from the former, leaves 668261; the square root of which is e c, 817.472; which, taken from the radius 819, leaves 1.528 feet, the required middle ordinate, d e.

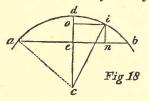
Rule 2.—Subtract the tabular cosine of the tangential angle from 1, and multiply the remainder by the radius.

Example.—Same as foregoing, namely, radius 819 feet, angle of deflection 7°, to chords of 100 feet. What will be the length of the middle ordinate?

Here, tabular cosine of $3\frac{1}{2}^{\circ}$ (the tangential angle) is $\cdot998135$; which, subtracted from 1, leaves $\cdot001865$; which, multiplied by 819, the radius, gives $1\cdot527$, the middle ordinate required.

ARTICLE XX.

Having given the Middle Ordinate d e, fig. 18, it is required to find any other one, as in.



Rule 1.—Subtract the middle ordinate d e, from the radius d c, the remainder will be e c: then from the square of the radius c i, subtract the square of the distance o i, which the required ordinate i n is from the middle

ordinate d e, and extract the square root of the remainder. This square root will be o c. From this square root o c, subtract e c; the remainder will be o e, which is equal to i n, the required ordinate.

Example.—The middle ordinate de, of a 100 feet chord ba, to a radius of 819, being 1.528 feet, it is required to find the length of the ordinate in, 20 feet from the middle one.

Here, the middle ordinate de, 1.528, subtracted from the radius 819, leaves ec, 817.472. The square of the radius is 670761; and the square of 20 (the distance of the required ordinate from the middle one) is 400; which taken from 670761, leaves 670361; the square root of which is 818.756, or oc; from which take ec, or 817.472, and the remainder, 1.284, will be oe, which is equal to in, the required ordinate.

Rule 2.—Multiply the ordinates of a 1° curve by the deflection angle of the curve whose ordinates are required, (chords being 100 feet.) This is a sufficiently close approximation for curves of not less than 500 feet radius; and for placing ordinates for guiding the excavations and embankments, it is close enough for the smallest curves in our table.

TABLE OF RADII, &c.-CHORD 100 FEET.

The Tangential Angle is always one-half of the Angle of Deflection.

Angle o Deflectio		Deflection distance in feet.	Tangential distance in feet.	Angle of Deflection.	Radius in feet.	Deflection distance in feet.	Tangential distance in feet.
0 /				0 /			
1	343800	.029	.014	44	7814	1.279	•639
2	171900	.058	.029	45	7640	1.308	.654
3	114600	.087	.043	46	7474	1.337	.668
4	85950	•116	.058	47	7315	1.366	.683
5	68760	.145	.072	48	7162	1.395	.697
6	57300	.174	.087	49	7016	1.424	.712
7	49116	-203	•101	50	6876	1.453	.726
8	42975	-232	•116	51	6741	1.482	.741
9	38200	•262	-131	52	6611	1.511	.755
10	34380	·202	•145	53	6487	1.540	.770
10	31256	•320	•160	54	6367	1.569	.784
		•349	•174	55	6251	1.598	.799
12 13	28650	•349	•174	56	6139	1.627	.813
	26446		•203	57	6032	1.656	.828
14	24558	•407			5928	1.685	•842
15	22920	•436	•218	58	5928	1.000	.857
16	21487	•465	-232	1 ⁵⁹		1.745	.872
17	20224	*494	•247		5730		.901
18	19100	•523	•261	2	5545	1.802	
19	18094	•552	•276	4	5372	1.860	•930
20	17190	•581	•290	6	5209	1.918	•959
21	16372	·610	·305	8	5056	1.976	.988
22	15628	•639	·319	10	4912	2 036	1.018
23	14948	·668	·334	12	4775	2.094	1.047
24	14325	·697	•348	14	4646	2.152	1.076
25	13752	•727	•363	16	4524	2.210	1.105
26	13223	•756	·378	18	4408	2.268	1.134
27	12733	•785	·392	20	4298	2.326	1.163
28	12279	·814	·407	22	4193	2.384	1.192
29	11856	·843	•421	24	4093	2.443	1.221
30	11460	·872	•436	26	3998	2.501	1.250
81	11090	•900	·450	28	3907	2.559	1.279
32	10744	•930	•465	30	3820	2.617	1.308
33	10419	.959	•479	32	3737	2.676	1.338
34	10112	•988	•494	34	3657	2.734	1.367
35	9823	1.017	•508	36	3581	2.793	1.396
36	9550	1.046	•523	38	3508	2.851	1.425
37	9292	1.075	•537	40	3438	2.908	1.454
38	9047	1.104	.552	42	3370	2.967	1.483
39	8815	1.133	•566	44	3306	3.025	1.512
40	8595	1.162	·581	46	3243	3.083	1.541
41	8385	1.191	·595	48	3183	3.141	1.570
42		1.221	•610	50	3126	3.199	1.599
43	7995	1.250	·625	52	3069	3.258	1.629
				1			

3

TABLE OF RADII, &c.-CHORD 100 FEET.

CONTINUED.

The Tangential Angle is always one-half of the Angle of Deflection.

				1		1	
Angle of	Radius	Deflection	Tangential	Angle of	Radius	Deflection	Tangential
Deflection.	in feet.	distance in feet.	distance in feet.	Deflection.	in feet.	distance in feet.	distance in feet.
0 /	0010	3.316	1.050	0 /	1810		0.000
1 54	3016		1.658	3 20	1719	5.817	2.908
56	2964	3.374	1.687	22	1702	5.875	2.937
3 ⁵⁸	2914	3.432	1.716	24	1685	5.933	2.966
	2865	3.490	1.745	26	1669	5.992	2.996
2	2818	3.548	1.774	28	1653	6.020	3.025
4	2772	3.606	1.803	30	1637	6.108	3.054
6	2729	3.665	1.832	32	1621	6.166	3.083
8	2686	3.723	1.861	34	1606	6.224	3.112
10	2644	3.781	1.890	36	1591	6.282	8.141
12	2604	3.839	1.919	38	1577	6-340	3.170
14	2566	3.897	1.948	40	1563	6.398	3.199
16	2528	3.956	1.978	42	1549	6.456	3.228
18	2491	4.014	2.007	44	1534	6.515	3.257
20	2456	4.072	2.036	46	1521	6.574	3.287
22	2421	4.130	2.065	48	1508	6.632	3.316
24	2387	4.188	2.094	50	1495	6.690	3.345
26	2355	4.246	2.123	52	1482	6.748	3.374
28	2323	4.305	2.152	54	1469	6.806	3.403
30	2292	4.363	2.182	56	1457	6.864	3.432
32	2262	4.421	2.210	58	1445	6.922	3.461
34	2232	4.479	2.239	4	1433	6.980	3.490
36	2204	4.538	2.269	5	1403	7.125	3.562
38	2176	4.596^{-1}	2.298	10	1375	7.270	3.635
40	2149	4.653	2.326	15	1348	7.416	3.708
42	2122	4.712	2.356	20	1322	7.563	3.781
44	2096	4.770	2.385	25	1298	7.708	3.854
46	2071	4.828	2.414	30	1274	7.853	3.927
48	2046	4.886	2.443	35	1251	7.998	3.999
50	2023	4.944	2.472	40	1228	8.143	4.071
52	1999	5.002	2.501	45	1207	8.289	4.145
54	1976	5.060	2.530	50	1185	8.432	4.216
56	1953	5.118	2.559	55	1166	8.577	4.288
58	1932	5.176	2.588	200	1146	8.722	4.361
3 00	1910	5.235	2.618	5	1127	8.869	4.434
2	1889	$5 \cdot 293$	2.646	10	1109	9.014	4.507
4	1868	5.351	2.675	15	1092	9.159	4.579
6	1848	5.409	2.704	20	1074	9.304	4.652
8	1828	5.468	2.734	$\overline{25}$	1058	9.449	4.724
10	1810	5.526	2.763	30	1042	9.595	4.798
12	1790	5.584	2.792	35	1026	9.740	4.870
14	1772	5.642	2.821	40	1011	9.885	4.942
16	1754	5.700	2.850	45	996.8	10.03	5.015
18	1736	5.758	2.879	50	982.7	10.18	5.090
10	1100		5 0,0				

18.11

TABLE OF RADII, &c.-CHORD 100 FEET.

CONTINUED.

The Tangential Angle is always one-half of the Angle of Deflection.

-							
Angle of Deflection.	Radius in feet.	Deflection distance in feet.	Tangential distance in feet.	Angle of Deflection.	Radius in feet.	Deflection distance in feet.	Tangential distance in feet.
0 /	·			0 /			
5 55	969.0	10.32	5.160	12 30	459.3	21.79	10.90
6	955.4	10.47	5.235	o 45	450.3	22.21	11.12
5	947.5	10.62	5.310	13	441.7	22.64	11.34
10	939.7	10.76	5.380	15	$433 \cdot 4$	23.07	11.56
15	917.0	10.90	5.450	30	425.5	23.51	11.77
20	905.0	11.04	5.520	o 45	417.7	23.94	11.99
25	893.5	11.20	5.600	14	410.3	24.37	12.21
30	882.0	11.34	5.670	15	$403 \cdot 1$	24.81	12.43
35	870.7	11.48	5.740	30	$396 \cdot 2$	25.24	12.65
40	859.5	11.63	5.815	- 45	389.6	25.67	12.86
45	849.3	11.78	5.890	15	$383 \cdot 1$	26.11	13.08
50	838.9	11.92	5.960	15	376.9	26.52	13.30
55	828.9	12.06	6.030	30	370.8	26.94	13.52
9 00	819.0	12.21	6.105	。 45	365.0	27.37	13.73
5	813.3	12.36	6.180	16	359.3	27.83	13.95
10	807.4	12.50	6.250	, 30	348.4	28.70	14.38
15	790.8	12.64	6.320	17	338.3	29.56	14.82
20	781.9	12.79	6.395	20	328.7	30.43	15.25
25	773.2	12.94	6.470	18	319.6	31.29	15.69
30	764.5	13.08	6.540	。 30	311.0	32.15	16.12
35	$756 \cdot 1$	13.22	6.610	19	302.9	33.01	16.56
40	748.0	13.37	6.685	, 30	295.3	33.87	16.99
45	739.9	13.51	6.755	20 00	287.9	34.73	17.43
50	732.0	13.66	6.830	21	274.4	36.44	18.30
55	724.3	13.80	6.900	22	262.0	38.15	19.17
8	716.8	13.95	6.975	23	250.8	39.87	20.02
15	$695 \cdot 1$	14.38	7.190	24	240.5	41.58	20.91
- 30	674.6	14.81	7.405	25	231.0	43.28	21.77
45	655.5	15.25	7.625	26	222.3	44.98	22.64
9 40	637.3	15.68	7.840	27	214.2	46.68	23.51
15	620.2	16.12	8.060	28	206.7	48.38	24.37
30	603.8	16.55	8.275	29	199.7	50.07	25.24
45	588.4	16.99	8.495	30	$193 \cdot 2$	51.76	26.11
10 10	573.7	17.43	8.715	31	187.1	53.45	26.97
15	559.7	17.87	8.935	32	181.4	55.13	27.83
30	546.4	18.30	9.150	33	176.0	56.80	28.70
45	533.8	18.73	9.365	34	171.0	58.47	29.56
11	521.7	19.17	9.585	-35	166.3	60.14	30.42
15	510.1	19.61	9.805	36	161.8	61.80	31.29
30	499.1	20.05	10.03	37	157.6	63.46	32.15
. 45	488.5	20.50	10.25	38	153.6	65.11	33.01
12 40	478.3	20.94	10.47	39	149.8	66.76	33.87
15	468.7	21.36	10.69	40	146.2	68.40	34.73
	1	1	1				

TABLE OF ORDINATES.

Ordinates five feet apart .- Chord one hundred feet.

Distances of the Ordinates from the end of the 100 feet Chord.										
Angle Defl'		le, ar car	1	35 feet.	30 feet.	25 feet.	20 feet.	15 feet.		5 feet.
			-							0 1000
	2 00	- 00		000	000	0.07				
($2 \cdot 00$			•006	•006	•005	•003	•003	·002	·001
	4 .01			•013	•012	•010	•008	.008	.005	·003
				•020	•019	•016	• 013	·011	·008	·004
1				•026	•024	•022	•018	•015	·010	·005
1				•033	031	·027	·023	·019	·013	•007
1				•038	•037	•033	·028	·022	·015	.008
1				•044	•043	·038	·032	·026	·017	·010
1				•052	·049	·044	•037	·030	·020	·011
2				·059	•055	·050	•042	•033	·023	·013
$\frac{2}{2}$				·066	·061	·055	-047	·037	·026	·014
2				·071 ·077	·067 ·074	·060 ·066	$0.051 \\ 0.056$	·041	·029	·015
2				·077	.074	·000	·060	·045	·031	·017
2				.084 .092	·080	.071	.065	·048 ·052	·034	·018
3				·092	.080 .092	.082	.005	·052	·036	-019
3				·106	·092 ·098	·082	.070	·058	•039	·020 ·022
ə. 3.				·100	·104	.000	.075	.058 .062	.042	
3				$.111 \\ .119$	·1104	-094	.079	.066	·044 ·047	·023 ·024
3				.126	·116	·105	.089	.070	·047	·024
4				$\cdot 120$ $\cdot 133$	$\cdot 123$.110	.089	.074	.049	$.025 \\ .027$
4				-138	-123	·115	·093	.077	·052	027
4		-		.145	.135	-121	.103	-081	·055	028
4				.152	·141	·121	.103	.085	.060	.032
48				.152	.147	·132	·112	.088	·062	.032 .033
- 50				·166	.153	.132	·112	·092	·065	·034
5:			.181	.171	.159	.143	.122	.095	.068	.035
5				.178	.165	.148	$\cdot 126$.099	.070	.036
56			.195	.185	.171	.154	.131	.103	.073	.038
20			.202	.192	.177	.159	.136	.107	-075	.039
î	.218		.209	.198	.183	.164	.140	.111	.078	.041
1 2			.215	.204	.189	·169	.145	.114	.081	.042
4			·223	·211	·196	.175	.150	·118	.083	.043
é			.230	.217	.202	.180	.155	·121	.086	.045
ě			.237	.224	-208	·186	.159	·125	.088	.046
10			-244	.231	.214	.191	.163	.130	.091	.048
12			·252	.237	-220	·196	.168	·133	.094	.049
14			-258	.244	·226	.202	.173	.136	.096	.050
16			.265	.251	·232	.207	.177	.140	.099	.052
18			.273	.257	·238	·213	.182	.144	.101	.053
20			.279	.264	.244	.218	.187	.148	.104	.055
	1		1						1	

TABLE OF ORDINATES-CONTINUED.

Ordinates five feet apart .- Chord one hundred feet.

Distances of the Ordinates from the end of the 100 feet Chord.											
	tle of	Middle, 50 feet.	45 feet.	40 feet.	35 feet.	30 feet.	25 feet.	20 feet.	15 feet.	10 feet.	5 feet.
° 1	, 22	·298	·295	·285	·270	·250	·224	.192	·151	·107	·056
-	24	.306	·303	·293	.277	·256	.229	.197	.155	.109	.057
	$\overline{26}$.313	·310	·300	·284	.263	.235	.201	.159	.112	.059
	28	·320	·317	·307	.291	·269	·240	.206	.163	.114	.060
	30	.327	·324	·314	·297	.275	.246	·210	.167	.117	.062
	32	·334	·331	·321	·304	·281	.251	·215	.171	.120	·063
	34	·341	·338	·328	·310	·287	.257	·219	.174	.122	.065
	36	·349	·345	.335	·317	·293	.262	·224	.178	.125	·066
	38	.356	.353	.342	·323	·299	·268	·228	.182	.127	.068
	40	·364	·360	·349	·330	.305	.273	·233	.185	·130	.069
	42	.371	·367	.356	.337	·312	.278	·238	.189	·133	.070
	44	.378	.374	·363	.343	.318	$\cdot 284$.242	.192	.135	.072
	46	.385	.382	.370	·350	.324	.289	.247	.196	·138	.073
	48	.393	.389	.377	·356	·330	.295	.251	.200	·141	.075
	50	·400	·396	.384	.364	·336	·300	·256	.204	.144	.076
	52	.407	.403	$\cdot 391$	·370	·342	·305	·261	·208	.147	.077
	54	·414	·410	·398	·376	·348	·311	·265	·211	.149	.079
	56	·422	·418	·405	·383	.354	·316	.270	·215	.152	.080
~	58	.429	·425	·412	·389	360	.322	.275	·219	·154	.082
2		·436	·432	·419	·397	·366	·327	.280	.222	·157	.083
	2	·443	·439	·426	$\cdot 402$	·373	·332	·284	·226	·160	.084
	4	.451	•446	·433	·409	·379	·338	·289	·230	·162	.086
	6	.458	.454	·440	·416	·385	·343	·293	·234	.165	.087
	8	·465	·461	·447	·425	$\cdot 391$	·349	·298	·237	.167	.088
	10	.473	·468	·454	·430	·397	·355	·303	·241	.170	.089
	12	·480	.475	·461	·437	·403	·360	·308	·245	.173	.090
	14	·487	.482	·468	.443	·409	·366	·312	·248	.175	.092
	16	.495	·490	.475	·450	·415	·371	·317	$\cdot 252$.178	·093
	18	.502	.497	482	·456	·421	·377	·321	·256	·180	·095
	20	.509	.504	·489	·463	·428	.382	.326	.260	.183	.096
	22	.516	.511	.496	.470	·434	·387	·330	.264	.186	.097
	24	·523	.518	.503	.476	·440	·393	·334	.267	.188	·099
	26	.531	.526	.510	•483	.446	.398	.338	.271	·191	·100
	28	.538	.533	.517	·489	.452	.404	·346	.275	.194	.102
	30	.545	.540	.524	•496	.458	·409	·350	.278	.196	·103
	32	.552	.547	.531	·503	·465	·415	·355	·282	·199	·104
	34	.560	.554	.538	.509	.471	.420	.359	·285	·201	·106
	36	.567	$\cdot 562$.545	.516	.477	·425	·364	·289	·204	.107
	38	.574	.569	.552	.522	·483	·431	·368	·293	·206	.109
	40	.582	.576	.559	.529	·489	·436	·373	·297	·209	·110

TABLE OF ORDINATES-CONTINUED.

Ordinates five feet apart .- Chord one hundred feet.

Distances of the Ordinates from the end of the 100 feet Chord.											
	le of fl'n.	Middle, 50 feet.	45 feet.	40 feet.	35 feet.	30 feet.	25 feet.	20 feet.	15 feot.	10 feet.	5 feet.
$\overset{\circ}{2}$	4 2	•589	·583	·566	·536	·495	·441	·378	·301	·212	·111
	44	·596	.590	.573	.542	.501	.447	.382	·304	·214	·113
	46	·603	.598	·580	.549	.507	.452	·387	·308	.217	.114
	48	·611	·605	.587	.555	.513	.458	·391	.312	.219	·116
	50	·618	·612	.594	.562	.519	.464	·396	·315	.222	.117
	52	$\cdot 625$	·619	·601	.569	.526	·469	·401	·319	·225	·118
	54	·632	·626	.608	.575	$\cdot 532$.474	·405	·322	·227	·119
	56	·640	·634	.615	.582	.538	·480	·410	·326	·230	$\cdot 121$
	58	.647	·641	·622	.588	.544	.485	.414	.330	·232	$\cdot 123$
3		.654	·648	$\cdot 629$.595	.550	.491	·419	·334	·235	.124
	2	·661	.655	·636	.602	.556	·496	.424	·338	·238	$\cdot 125$
	4	·669	.662	·643	.608	.562	.502	·428	·341	$\cdot 240$	$\cdot 127$
	6	.676	.670	·650	.615	.568	.507	·433	·345	·243	·128
	8	.683	.677	.657	·621	.574	.512	·438	·349	.246	·130
	10	·691	.684	·664	.629	.581	.518	·443	·353	·249	·131
	12	.698	.691	·671	·635	.587	·523	·448	·357	$\cdot 251$	·132
	14	.706	.698	.678	·642	.593	.529	·452	·360	$\cdot 254$	·134
	16	.713	.705	.685	.649	.599	.534	.457	·364	.257	·135
	18	.720	.713	·692	.655	.605	.540	•462	·368	$\cdot 259$.137
	20	.727	.720	.699	•662	.611	.545	·466	.371	·262	.138
	22	.734	.727	.706	.668	.617	.550	.471	.375	.264	.139
	24	.742	.734	.713	.675	.623	.556	.475	.378	·267	.141
	$\overline{26}$.749	.742	.720	.682	·629	.561	·480	.382	.270	·142
	28	.756	.749	.727	.688	·635	.567	.485	.386	.272	.144
	30	.764	.756	.734	.695	.642	.573	.489	·390	$\cdot 275$.145
	32	.771	.763	.741	.702	.648	.578	.494	·394	.278	·146
	34	.779	.770	.748	.708	.654	.584	.498	·397	·280	·148
	36	.786	.777	.755	.715	·660	.589	.503	·401	·283	·149
	38	.793	.785	.762	.721	·666	.594	.508	·405	·285	$\cdot 151$
	40	·800	.792	·769	.728	·673	·600	.512	·408	$\cdot 288$	$\cdot 152$
	42	·807	.799	.776	.734	·679	·605	.517	·412	·291	·153
	44	·814	·806	.783	.741	.685	·611	·521	·415	·293	·155
	46	·822	·814	.790	.748	·691	·616	$\cdot 526$	·419	·296	·156
	48	·829	·821	.797	.754	.697	·621	.531	·423	·298	·158
	50	·836	·828	·804	·761	.703	·627	·536	·427	·301	·159
	52	·843	·835	·811	.768	.709	.632	·541	·431	·304	·160
	54	·850	·842	·818	.774	.715	.638	.545	.434	·306	·162
	56	·858	·850	·825	·781	.721	.643	.550	.438	·309	·163
0	58	·865	·857	·832	.787	.728	.648	.555	.442	.311	·165
4	-	·873	·864	·839	.794	.734	-655	.559	.445	·314	.166
		Transfer 1									

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TABLE OF ORDINATES-CONTINUED.

Ordinates five feet apart .- Chord one hundred feet.

		I	Distances	of the O	rdinates	from the	end of t	he 100 fee	t Chord.		
Ang De	le of fl'n.	Middle, 50 feet.	45 feet.	40 feet.	35 feet.	30 feet.	25 feet.	20 feet.	15 feet.	10 feet.	5 feet.
$\overset{\circ}{4}$, 5	·891	·882	·856	·810	.749	.668	·571	·454	·320	·169
-	10	.909	.900	.874	·827	.764	.682	.582	·464	·327	.173
	15	.927	.918	·891	.844	.780	.695	.594	.473	·334	.176
	20	.945	.936	.909	·860	.795	.709	.606	·482	·340	.179
	25	.963	.954	.926	.877	·810	.723	.617	.491	.347	.183
	30	·981	.972	·944	·893	.825	.736	.629	.501	.354	·186
	35	.999	.990	.961	·909	·840	.750	.640	.510	·360	·189
	40	1.017	1.008	.979	·926	·855	.764	.652	.519	.367	.193
	45	1.036	1.026	.996	.943	·871	.777	.664	.529	.373	.196
	50	1.054	1.044	1.014	.959	·886	.791	.676	.538	.380	.199
	55	1.072	1.062	1.031	.976	·901	·804	.687	.547	.386	·203
25		1.091	1.080	1.048	.993	.917	·818	.699	.557	.393	.207
-	5	1.109	1.098	1.065	1.009	.932	.831	.711	.566	.400	·210
	10	1.127	1.116	1.083	1.026	.947	.845	.722	.576	.406	·214
	15	1.146	1.134	1.100	1.042	.963	.859	.734	.585	.413	·217
	20	1.164	1.152	1.118	1.058	.978	.872	.746	.594	·419	·220
	25	1.182	1.170	1.135	1.075	.993	.886	.757	.603	·426	·224
	30	1.200	1.188	1.153	1.092	1.009	.900	.769	.613	·432	·228
	35	1.218	1.206	1.170	1.108	1.024	.913	.781	.622	.438	·231
	40	1.236	1.224	1.188	1.124	1.039	.927	.792	·631	.445	.235
	45	1.255	1.242	1.205	1.141	1.055	.941	·804	.640	.452	.238
	50	1.273	1.260	1.223	1.157	1.070	.954	·816	.649	.458	·241
	55	1.291	1.278	1.240	1.174	1.085	.967	·827	.658	·465	·245
ő		1.309	1.296	1.258	1.191	1.100	.982	·839	.668	.472	·248
	5	1.327	1.314	1.275	1.207	1.115	.995	·851	.677	.478	.251
	10	1.345	1.332	1.293	1.224	1.130	1.009	·862	.686	.485	.255
	15			1.310	1.240	1.146	1.023	.874	.696	.492	.259
	20	1.382	1.368	1.328	1.256	1.161	1.036	·886	.705	.498	.262
	25	1.400	1.386	1.345	1.273	1.176	1.050	.897	.714	.505	·266
			1.404		1.290	1.192	1.064	.909	.724	.511	.269
			1.422		1.306	1.207	1.077	.921	.733	.517	.272
	40	1.455	1.440	1.397	1.323	1.222	1.091	.932	.742	.524	.276
	45	1.473	1.458	1.415	1.339	1.238	1.105	.944	.752	·531	-280
	50		1.476	1.432	1.355	1.253	1.118	·956	.761	.537	.283
	55	1.509	1.494		1.372	1.268	1.132	.967	.770	.544	.287
?		1.528	1.512	1.467	1.389	1.284	1.146	.979	.779	-551	·290
	5	1.546	1.530	1.484	1.405	1.299	1.159	·991	.788	.557	·293
	10	1.564	1.548	1.502	1.422	1.314	1.173	1.002	.798	.564	.297
	15	1.582	1.566	1.520	1.438	1.330	1.187	1.014	.807	.579	·301
	20	1.600	1.584	1.537	1.454	1.345	1.200	1.026	·816	.576	·304
		1									

TABLE OF ORDINATES-CONTINUED.

Ordinates five feet apart .- Chord one hundred feet.

		1	Distances	of the C	rdinates	from the	end of t	he 100 fe	et Chord		
	le of fl'n.	Middle, 50 feet.	45 feet.	40 feet.	35 feet.	30 feet.	25 feet.	20 feet.	15 feet.	10 feet.	5 feet.
° 7	25	1.618	1.602	1.555	1.471	1.360	1.214	1.037	·825	·583	·308
1	30	1.637	1.620	1.572	1.488	1.375	1.228	1.048	·835	•590	·311
	35	1.655	1.638	1.589	1.504	1.390	1.241	1.060	·844	·596	·314
	40	1.673	1.656	1.607	1.521	1.405	1.255	1.071	·854	·603	·318
	45	1.692	1.674	1.624	1.537	1.421	1.269	1.083	•863	•610	·321
	50	1.710	1.692	1.641	1.553	1.436	1.282	1.095	·872	·616	·324
8	55	1.728	1.710	1.659	1.570	1.451	1.296	1.106	·881	·623	·328
8		1.746	1.728	1.677	1.587	1.467	1.310	1.118	·891	·629	·332
	15	1.801	1.782 1.836	$1.729 \\ 1.782$	1.637	1.513	$1.351 \\ 1.392$	$1.153 \\ 1.188$	·918	•649	·342
	30	1.855	1.890	1.834	1.687 1.737	$1.559 \\ 1.605$	1.392 1.433	$1.100 \\ 1.223$	·946 ·974	·669 ·689	•353 •363
ŝ	45	1.910 1.965	1.944	1.886	1.787	1.605 1.651	1.455 1.474	$1.220 \\ 1.258$	1.002	.089	·303
9	15	2.019	1.998	1.939	1.837	1.696	1.515	1.293 1.293	1.030	.728	·384
	30	2.019 2.074	2.052	1.991	1.887	1.742	1.556	1.328	1.057	.748	.394
	45	2.074 2.128	2.002 2.106	2.044	1.937	1.788	1.597	1.320 1.363	1.085	.767	.405
10	40	2.120 2.183	$2.100 \\ 2.161$	2.096	1.987	1.834	1.637	1.398	1.114	.787	•415
10	15	2.238	2.215	2.148	2.037	1.880	1.678	1.433	1.142	.807	.425
	30	2.292	2.269	2.201	2.087	1.926	1.719	1.468	1.170	·827	•436
	45	2.347	2.323	2.251	2.136	1.972	1.761	$1.400 \\ 1.503$	1.198	.846	•446
1 [°] 1	10	2.401	2.377	2.306	2.186	2.018	1.802	1.538	1.226	·866	.457
11	15	2.456	2.432	2.359	2.236	2.064	1.843	1.574	1.254	.886	.467
	30	2.511	2.486	2.411	2.286	2.110	1.884	1.609	1.282	.906	.478
	45	2.566	2.540	2.464	2.336	2.156	1.926	1.644	1.310	.926	.488
$ _{12}^{\circ}$	10	2.620	2.594	2.516	2.386	2.203	1.967	1.680	1.339	·946	.499
1.00	15	2.675	2.649	2.569	2.436	2.249	2.008	1.715	1.367	.966	.509
	30	2.730	2.703	2.621	2.485	2.295	2.049	1.750	1.395	·985	·520
	45	2.785	2.757	2.674	2.535	2.341	2.091	1.785	1.423	1.005	.530
13		2.839	2.811	2.726	2.585	2.387	2.132	1.820	1.451	1.025	.541
	15	2.894	2.865	2.779	2.635	2.433	2.173	1.855	1.479	1.045	·551
	30	2.949	2.920	2.832	2.685	2.479	2.214	1.891	1.507	1.065	$\cdot 562$
0	45	3.000	2.974	2.884	2.735	2.525	2.256	1.926	1.535	1.085	.572
14		3.058	3.028	2.937	2.785	2.571	2.297	1.961	1.564		·583
	15	3.113	3.082	2.989	2.834	2.618	2.338	1.996	1.592		·593
	30	3.168	3.136	3.042	2.884	2.664	2.379	2.031	1.620		·604
0	45	3.222	3.191	3.094	2.934	2.710	2.421	2.067	1.648		·614
15		3.277	3.245	3.147	2.984	2.756	2.462	2.102	1.676		·625
	15	3.332	3.299	3.200	3.034	2.802	2.503		1.704		•635
	30	3.387	3.354	3.252	3.084	2.848	2.544	2.172	1.732		•646
0	45	3.442	3.408	3.305	3.134	2.895	2.586	2.208	1.760	-	•656
16		3.496	3.462	3.358	3.184	2.941	2.627	2.243	1.789	1.264	•667
1			1	1	1	1		1	1	1	

TABLE OF ORDINATES-CONTINUED.

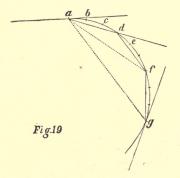
Ordinates five feet apart .- Chord one hundred feet.

		I	Distances	of the O	dinates	from the	end of th	e 100 fee	t Chord.		
Angl Def		Middle, 50 feet.	45 feet.	40 feet.	35 feet.	30 feet.	25 feet.	20 feet.	15 feet.	10 feet.	5 feet.
$\overset{\circ}{16}$	30	3.606	3.571	3.463	3.284	3.033	2.710	2.314	1.845	1.304	·688
17		3.716	3.680	3.569	3.384	3.125	2.792	2.384	1.902	1.344	.709
	30	3.826	3.788	3.674	3.484	3.218	2.875	2.455	1.958	1.384	.730
18	00	3.935	3.897	3.779	3.584	3.310	2.958	2.525	2.014	1.424	.751
	30	4.045	4.006	3.885	3.684	3.403	3.040	2.596	2.071	1.464	.772
19	00	4.155	4.115	3.990	3.784	3.495	3.123	2.666	2.127	1.504	.793
	30	4.265	4.223	4.096	3.884	3.588	3.205	2.737	2.184	1.544	·814
20	00	4.375	4.332	4.201	3.984	3.680	3.288	2.808	2.240	1.583	·836
21		4.595	4.549	4.412	4.184	3.864	3.454	2.950	2.353	1.663	.879
22		4.815	4.768	4.624	4.386	4.050	3.620	3.093	2.467	1.744	.922
23		5.035	4.986	4.836	4.587	4.237	3.786	3.236	2.581	1.824	.965
24		5.255	5.204	5.048	4.789	4.423	3.952	3.379	2.695	1.905	1.008
25		5.476	5.422	5.260	4.989	4.609	4.119	3.522	2.809	1.986	1.051
26		5.697	5.642	5.473	5.192	4.798	4.286	3.665	2.924	2.068	1.094
27		5.918	5.860	5.685	5.393	4.984	4.454	3.808	3.039	2.150	1.137
28		6.139	6.079	5.898	5.595	5.171	4.622	3.952	3.154	2.232	1.181
29		6.361	6.298	6.110	5.796	5.357	4.790	4.095	3.269	2.314	1.224
30		6.582	6.517	6.323	5.999	5.544	4.958	4.239	3.385	2.396	1.268
31		6.804	6.737	6.537	6.202	5.733	5.127	4.384	3.502	2.481	1.312
32		7.027	6.957	6.751	6.406	5.922	5.297	4.530	3.619	2.565	1.356
33		7.249	7.178	6.965	6.609	6.111	5.467	4.676	3.737	2.649	1.401
34		7.472	7.398	7.179	6.813	6.300	5.637	4.822	3.854	2.733	1.445
35		7.694	7.619	7.393	7.017	6.489	5.807	4.968	3.972	2.817	1.490
36		7.918	7.841	7.609	7.222	6.679	5.978	5.115	4.090		1.535
37		8.143	8.063	7.825	7.427	6.870	6.149	5.262	4.209		1.581
38		8.367	8.286	8.041	7.633	7.060	6.320	5.410	$ 4 \cdot 327$	3.069	1.626
39		8.592	8.508	8.257	7.838	7.251	6.491	5.557	4.446		
40		8.816	8.731	8.474	8.044	7.442	6.663	5.705	4.565	3.238	1.718
1							1				

ARTICLE XXI.

ON LONG CHORDS.

It is sometimes convenient, in preliminary locations, to lay off curves by chords longer than 100 feet. For instance, in fig. 19, instead of running from a by chords a b, b c, c d, &c. of but 100 feet, points d, f, g, &c. may be obtained with less trouble by using three times the tangential or deflection angles of the table, (as the case may be,) and employing chords a d, d f, f g, &c. nearly three times as



long as the chords a b, b c, &c.; or if a d, df, fg be either 2 or 4 stations apart, then 2 or 4 times the tangential and deflection angles would be used; and chords nearly 2 or 4 times 100 feet in length.

The following table contains the precise length of chord required to subtend respectively 1, 2, 3, or 4 stations. It is seldom desirable to exceed the latter limit.

TABLE OF LONG CHORDS.

Radius in feet.	Angle of Deflection.	1 Station.	2 Stations.	feet required to	4 Stations.
		I Station.	2 Stations.	5 Stations.	4 Stations.
5730.0	1°	100	200.0	300.0	400 0
4584.0	노	100	200.0	300.0	399.9
3820.0	1	100	200.0	300.0	399.9
3274.0		100	200.0	300.0	399.8
2865.0	20 *	100	200.0	299.9	399.7
2547.0	1	100	200.0	299.9	399.6
2292.0	1	100	200.0	299.8	399.5
2084.0		100	200.0	299.8	399.4
1910.0	30 *	100	200.0	299.7	399.3
1763.0	1	100	200.0	299.7	399.2
1637.0	-(4 - (2 c) 4	100	200.0	299.6	399.1
1528.0	200	100	200.0	299.6	399.0
1433.0	4° 4	100	199.9	299.6	398.9
1348.0	1	100	199.9	299.5	398.7
1274.0	1	100	199.9	299.4	398.5
1207.0	141-101034	100	199.9	299.3	398.3
1146.0	50 4	100	199.9	299.2	398.0
1092.0	1	100	199.8	299.1	397.8
1042.0	4	100	199.8	299.0	397.6
996.8	14-172034	100	199.7	298.9	397.5
955.4	6° 4	100	199.7	298.8	397.3
917.0		100	199.7	298.7	397.0
882.0	1	100	199.7	298.6	396.7
849.3	141234	100	199.6	298.5	396.5
819.0	70 4	100	199.6	298.4	396.2
790.8		100	199.6	298.3	396.0
764.5	4	100	199.6	298.2	395.7
739.9	(4(24 03)4	100	199.6	298.1	395.4
716.8	80 4	100	199.6	298.0	395.1
695.1		100	199.0 199.5	297.9	394.8
674.6		100	199.5	297.8	394.5
655.5	23	100	199.3 199.4	297.8	394.3
637.3	90 4	100	199.4	297.5	394.1
620.2	· ·	100	199.4	297.4	393.7
603.8		100	199.4	297.4	393.2
588.4	23	100	199.3	297.3	393.2
573.7	10° 4	100	199.2	297.2	
010.1	10-	100	199.2	297.0	$392 \cdot 4$

chords than 100 feet.

When this method of laying out curves by long chords is used, the instrument should be moved to each successive point after it is determined, in order to fix the next one, instead of attempting to obtain more than one point from one position of the instrument; because when the chords are longer than one chain, they cannot be measured in the right direction by eye, but must be guided by the instrument.

It must be especially borne in mind that, in any given curve, only the tangential and deflection *angles* increase in the same proportion as the number of 100 feet stations subtended by the long chord. Therefore, *these* long chords cannot be used for laying out curves by eye, as their tangential and deflection *distances* are not known.

When it is required to use long chords for turning a curve by eye, they must be composed of a number of whole chains, being made say 200, 300, or 400, &c. feet in length. The tangential and deflection distances of curves of more than 500 feet radius may then be assumed, in practice, to increase as the squares of the number of chains in the length of the long chord. For instance, to lay off a 5° curve by chords of 200, 300, or 400 feet in length, the tangential and deflection distances of the table must be multiplied by 4, 9, or 16, as the case may be. In this case the tangential and deflection angles are unknown.

This is not mathematically correct, but will answer in practice for the curves on a canal or common road, where great nicety is not needed.

The only proper instrument for running lines of survey is the *transit*, furnished with a compass and with a revolving telescope. The deflections being measured in *angles*, serve as a check to the numerous sources of error to which the compass is liable, arising from local attraction, electrical action in the glass cover, diurnal variation, &c. &c. Besides, when the compass alone is used, it is necessary to test every course or bearing from each end of each station; and this involves loss of time.

The following is a good form of field-book for the transit and compass combined.

Station.	Distance.	Total Distance.	Course.	Deflection in Degrees. Left. Right.	The right hand page is left blank for Remarks, and Sketches of Topogra- phy.
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In every locating party there should be one person whose duty is to obtain, and record the transverse slopes of the ground at each station. His observations will usually extend to from fifty feet, to one hundred yards on each side of the centre stakes, depending on a variety of circumstances of locality which cannot be alluded to here. In preliminary locations these slopes need not be taken with very great nicety, as they will be used chiefly for ascertaining, approximately, the amount of excavation and embankment, by the rapid process described in my little volume on that subject, and which dispenses with nearly all the labor of the usual calculations.

After the final location is made, the slopes should be taken again, with great care, to the nearest quarter of a degree; but need not extend beyond the width actually occupied by the road. Their use in this second operation will be for determining the cubic contents with more precision than before, for final estimates; and also for obtaining the positions of the *side-stakes*.

Should the duty of *recording* these slopes devolve upon the compassman, (which it should not,) it will be necessary to add another column to his field-book, after that containing the deflections. In this column he will insert the slopes, thus, (Fig. 20.) Fig. 20. 300°

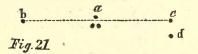
the dot representing the center stake. The degrees of slope are written above the lines, and the distance in feet to which they extend, below.

The slopes are taken by laying a long rod on the ground, at right angles to the line of survey, as nearly as may be judged by eye, and measuring the angles by means of a small slope instrument placed upon the rod. These are made by most of our instrument-makers.

ARTICLE XXII.

TO ADJUST A TRANSIT INSTRUMENT.

Having placed the transit firmly at a, fig. 21, and levelled it, clamp all fast, and direct the cross-hairs, by means of the tangent screw, to some convenient object, b. Then, revolving the telescope vertically, but without moving it in the least horizontally, let the cross-hairs fix upon a second object in the opposite direction, as c; or, if there be no such object, place one, as for instance a chain-pin, at any convenient distance.



Then unclamp the *lower* clamp, and revolve *horizontally* the entire upper part of the instrument above the parallel plates. Clamp it again, and fix the cross-hairs upon b; then again revolve the *telescope* vertically. If the sight now strikes c, as before, it is in adjustment; but if not, place another object, d, where it does strike; and with the adjusting pin alter the vertical cross-hair so as to strike halfway between d and c. The instrument will then be in adjustment.

Two or more trials will generally be needed before the adjustment is perfect.

With care, and on a firm floor, the operation may be performed in a long room, or by placing the instrument in a doorway communicating with two rooms of moderate size. Fine pins, or needles should then be used as the objects to be sighted at. It is better, however, to adjust out of doors, with more distant objects. It is also a good precaution to hang up a long plumb-line, or select some vertical object, and see whether the vertical hair coincides with it, as the telescope is raised or lowered. If from any accident, or carelessness in its construction, it does not, the defect must be remedied by an instrument-maker.

0 Deg.

0 Deg.

0'-0000000| 000000| 1nfinite. |1-000000| 50| 201086| -006108| 163-7001| -9999813| 39| 41| -0119261| -011927| 83-84350| -999928| 19| -0119261| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011927| -011921| -011922| -01102| -01102| -011922| -011922| -011922| -011922| -011922| -011922| -011922| -01122| -01122| -01192| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -01122| -0112| -01122| -01122| -01122| -01122| -01122| -01122| -0122| -18 $+ 0005818_{1000582} \\ 1718_{2010} \\ + 02823_{1012} \\ + 02823_{100} \\ + 02823$ $-0011636 \\ -001163 \\ -001163 \\ -001263 \\ -00225 \\ -00222 \\ -007272 \\ -07272 \\ -07272 \\ -0727$ $-0020362 [\cdot 002036] 491 \cdot 1060 [\cdot 9999979] 53 [28] \cdot 008144 [\cdot 008145 [\cdot 122 \cdot 7739] \cdot 999966 [32 [48] \cdot 013962 [\cdot 013963] 71 \cdot 61507 [\cdot 9999025] 12 \cdot 122 \cdot 123 \cdot 123$ $-0026180|\cdot002618|381\cdot9709|\cdot9999966|51|30|\cdot0087265|\cdot008726|114\cdot5886|\cdot9999619|30[50|\cdot0145439|\cdot014545|68\cdot75008|\cdot9998942|10|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot0026180|\cdot00260|\cdot0026180|\cdot0026180|\cdot0026180|\cdot002660|\cdot$ $-0014544 \\ -001454 \\ -001454 \\ -0889 \\ -0999999 \\ -01338 \\ -0138 \\ -0138 \\ -0138 \\$ $-0017453 \\ -0017453 \\ -0017453 \\ -0017453 \\ -007853 \\ -007854 \\ + 127\cdot3213 \\ + 0999662 \\ + 38\frac{1}{2}7 \\ + 0136713 \\ + 013672 \\ + 3823 \\ + 013672 \\ + 3823 \\ + 013672 \\ + 3823 \\ + 013672$ $-002327 \\ 129 \cdot 7175 \\ -9999973 \\ 52 \\ 23 \\ 29 \\ -008435 \\ -008455 \\ -00845 \\ -008455 \\ -008455 \\ -008455 \\ -008455 \\ -008455 \\ -00845$ $-0002909 \\ -000291 \\ 3437.746 \\ 1.00000 \\ 59 \\ 231.063995 \\ -0003995 \\ -002399 \\ -002399 \\ -002399 \\ -00239 \\$ $-0068727 \\ -0008727 \\ -0008721 \\ -0089966 \\ -0089966 \\ -0089813 \\ -0069813 \\ -0069813 \\ -00893126 \\ -00899756 \\ -0899756 \\ -0899756 \\ -0874 \\ -0127987 \\ -012799 \\ -08723 \\ -08723 \\ -0899956 \\ -08956 \\ -089956 \\ -08956 \\$ $-0029089] \cdot 002908] \cdot 002908] \cdot 343 \cdot 7737] \cdot 9999958] 50] 31 | \cdot 0090174 | \cdot 009017 | \cdot 106 \cdot 820 | \cdot 9999593 | 29 | 51 | \cdot 0148348 | \cdot 014836 | \cdot 67 \cdot 40185 | \cdot 9989900 | \cdot 1002908 |$ $-0034907, 003490] -3864777, 0999939] \\ 48] \\ 331-0095992 \\ -005599] \\ 104-1709], 0999539 \\ 237653 \\ -0154165 \\ -015418 \\ -01$ $[4] 0040724] 004072] \\ 245.5519] 0999917 \\ [46] \\ 35] 0101809] 010181 \\ [98 \cdot 21794] 0999482] \\ 25[55] 0159982] 01600 \\ [62 \cdot 49915] 0998720 \\ 25[55] 0159982] \\ 015982 \\$ $[6] - 0046542 \\ [10, 004654] \\ [214.8576] - 9999892] \\ [44] \\ [37] - 0107627 \\] - 010763 \\] \\ [32.90848] \\ - 9099421 \\ [32] \\ [32] \\ 57 \\] \\ [32] \\ [32] \\ 57 \\] \\ [32] \\ 57 \\] \\ [32] \\ [32] \\ 57 \\] \\ [32] \\ [32] \\ 57 \\] \\ [32] \\ [32] \\ 57 \\] \\ [32]$ $[8^{+}_{-0052360}]_{-005326}]_{-005326}]_{-005326}]_{-005326}]_{-0171616}]_{$ $[0] \cdot 305526[\cdot 305526] \times 322[\cdot 99993847] \times 41 [40] \cdot 011635] \cdot 011636] \times 519379] \cdot 99993323] \times 3066] \cdot 0174524] \cdot 017455] \times 5196] \cdot 0174524] \cdot 017455] \times 5106] \cdot 0174524] \cdot 017455] \times 5106] \cdot 0174524] \cdot 017455] \cdot 017555] \cdot 01755] \cdot 017455] \cdot 017555]$ Cosine. $[5] \cdot 0043633 \\ [20, 004363] \\ [229-1816] \cdot 9999905 \\ [45] \\ [36] \cdot 010471 \\ [8] \cdot 010472 \\ [9999452] \\ [24] \\ [56] \cdot 016239 \\ [90, 016239] \\ [90, 016239 \\ [90, 016239] \\ [90, 016239$ Sine. Cotang. Tang. Cosine. | Cotan. Tang. Sine. 111 Cosine. Sine. Cotang. Tang. Tang. Cosine. | Cotan. Sine. 0 Deg. 1 1 $20| \cdot 0058177 | \cdot 005817 | 171 \cdot 8854 | \cdot 9999831 | 40|$ Cosine. Sine. Cotang. Tang. I al.g. Cot n. .0023271 Cosine. Sine. 52 3 10 9 Ø Ξ 62 4 2

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| - | 19 | 18 | 21 | 1.6
 | 15 | 14 | 13
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 | 0 | - | 1. | 88. |
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Tang. Cotang. Cosine.	$ 0174524 \cdot 017455 57 \cdot 28096 \cdot 9998477 60 \cdot 21 \cdot 023566 + 2 \cdot 43346 \cdot 9997224 \\ 3941 \cdot 0293755 \cdot 029388 \\ 34 \cdot 02730 \cdot 9995684 \\ 19 \cdot 19 \cdot 10 \cdot 10 + 10 10 \cdot$	$-0177432 \cdot 077746 \\ 56 \cdot 35059 \cdot 9998426 \\ 59 \cdot 22 \cdot 023857 \\ 6 \cdot 023857 \\ 41 \cdot 91579 \\ -9997156 \\ 38 \\ 42 \cdot 0296662 \\ -029679 \\ 33 \cdot 69350 \\ -999556 \\ -9995569 \\ 18 \cdot 18 \\ -98957 \\ -98957 \\ -989556 \\ -98$
Cotang.	34-02730	33-69350
Tang.	029388	.029679
 | ·030552 | ·030843 | ·031135
 | -031426 | -031717 | ·032008 | .032299
 | .032591 | -032882 | .033173 | ·033464
 | ·033755 | 034047 | ·034338 | 034629
 | 034920 | | Cotan. | |
| Sine. | 0293755 | -0296662 | -0299570 | -0302478
 | 0305385 | -0308293 | 0311200
 | -0314108 | -0317015 | 0319922 | 0322830
 | 0325737 | 0328644 | 0331552 | 0334459
 | 0337366 | 0340274 | 0343181 | 0346088
 | 0348995 | | / / Cosine. Cotan. | |
| - | 41 | 42 | 43 | 44
 | 45 | 46 | 47
 | 18 | 49 | 50 | 51
 | 52 | 53 | 54 | 55
 | 56 | 57 | 58 | 59
 | 60 | | 1- | |
| ~ | 39 | 38 | 37 | 36
 | 35 | 34 | 33
 | 32 | 31 | 30 | 29
 | 28 | 27 | 26 | 25
 | 24 | 23 | 22 | 21
 | 20 | | 1- | 8 |
| Cosme. | ·9997224 | ·9997156 | 0807086 | ·9997015
 | ·9996943 | 1789996871 | 8679606
 | ·9996724 | ·9996649 | -9996573 | -9996497
 | .99996419 | 9996341 | ·9996262 , | ·9996182
 | 1019666. | 9996020 | 9995937 | 9995854
 | 9995770 | | Sine. | Deg. 88. |
| Cotang. Cosme. | 42-43346 | 41-91579 | 41-41058 | 40.91741
 | 40.43583 | 39-96546 | 39-50589
 | 39-05677 | 38-61773 | 38-18845 | 37-76861
 | 37-35789 | 36-95600 | 36-56265 | 36-17759
 | 35-80055 | 35-43128 | 35-06954 | 34.71511
 | 34-36777 | | Tang. | |
| Tang. | 023566 | -023857 | $\cdot 024148$ | 024439
 | 024730 | .025021 | .025312
 | -025603 | 025894 | 026185 | -026477
 | 026768 | 027059 | 027350 | 027641
 | 027932 | 028223 | 028514 | 0288054
 | 029097 | | Cotan. | |
| Sine. | 0235598 | 0238506 | -0241414 | -0244322
 | 0247230 | 0250138 | 0253046
 | 0255954 | 0258862 | 0261769 | 0264677
 | 0267585 | 0270493 | 0273401 | 0276309
 | 0279216 | 0282124 | 0285032 | 0287940
 | 0290847 | | / / Cosine. Cotan. | |
| - 1 | 21 | 22 | 23 | 24
 | 25 | 26 | 27
 | 28 | 29 | 30 | 31
 | 32 | 33 | 34 | 35
 | 36 | 37 | 38 | 39
 | 40 | | - | |
| - | 60 | 59 | 58 | 57
 | 56 | 55 | 54
 | 53 | 52 | 51 | 50
 | 49 | 48 | 47 | 46
 | 45 | 44 | 43 | 42
 | 41 | 40 | - | r. |
| Cosine. | ·9998477 | -9998426 | •9998374 | ·99993321
 | ·9998267 | .99998213 | ·9998157
 | 1018666. | ·9998044 | 9867986 | 7207927
 | 7997867 | 7087600. | ·9997745 | ·9997683
 | ·9997620 | ·9997556 | ·9997492 | ·9997426
 | .9997360 | ·9997292 | Sine. | Deg 88. |
| Cotang. Cosine. | 57-28996 | 56.35059 | 55-44151 | $54 \cdot 56130$
 | 53-70858 | 52-88211 | 52-08067
 | 51.30315 | 50-54850 | 49.81572 | 49-10388
 | 48-41208 | 47.73950 | 47-08534 | 46-44886
 | 45-82935 | 45-22614 | 44-63859 | 44.06611
 | 43.50812 | 20 -0232690 -023275 42-96407 -9997292 40 | Tang. | |
| Tang. | 017455 | 017746 | 018037 | -018328
 | ·018619 | 018910 | ·019201
 | .019492 | ·019783 | 020074 | 020365
 | 020656 | 020947 | 021238 | 021529
 | -021820 | 022111 | -022402 | 022693
 | .022984 | .023275 | Cotan. | |
| Sine. | 0174524 | 0177432 | 0180341 | 0183249
 | 0186158 | 0189066 | -0191974
 | 0194883 | 1677910 | 0200699 | 0203608
 | 0206516 | 0209424 | 0212332 | 0215241
 | 0218149 | 0221057 | 0223965 | 0226873
 | 0229781 | 0232690 | Cosine. Cotan. | |
| - 1 | 0 | - | 63 | 3
 | 4 | 10 | 9
 | 2 | 00 | 6 | 10
 | 11 | 12 | 13 | 14
 | 15 | 16 | 17 | 18
 | 19 | 20 | 1- | |

2 Deg.

2 Deg.

 $-0351902 \\ -035212 \\ -03292 \\ -04716 \\ -04716 \\ -04716 \\ -04716 \\ -04716 \\ -0771 \\ -04716 \\ -0771 \\$ 2 $0372251 \\ 10372250 \\ 1037226 \\ 1093649 \\ 1093069 \\ 1093069 \\ 10282 \\ 1043328 \\ 1043369 \\ 102326 \\ 102326 \\ 102328 \\ 10$ $0375158 \\ 0375158 \\ 0375158 \\ 03756 \\ 03260 \\ 04360 \\ 04360 \\ 04366$ $-0383878 \\ -038416 \\ -26,03073 \\ -0392629 \\ + 3833 \\ -0444912 \\ -044535 \\ + 22,45409 \\ + 9990098 \\ + 2753 \\ + 0503024 \\ + 0503024 \\ + 050365 \\ + 1985469 \\ + 985469 \\ + 985469 \\ + 985469 \\ + 985469 \\ + 986669 \\ + 986669$ $\mathbf{z}^{-0354809} \\ [035603] \\ \mathbf{z}^{-0354809} \\ [03764] \\ \mathbf{z}^{-035603} \\ \mathbf{z}^{-041652} \\ \mathbf{z}^{-041650} \\ \mathbf{z}^{-041621} \\ \mathbf{z}^{-02632} \\ \mathbf{z}^{-0991350} \\ \mathbf{z}^{-04123} \\ \mathbf{z}^{-0473970} \\ \mathbf{z}^{-07466} \\ \mathbf{z}^{-9988761} \\ \mathbf{z}^{-04166} \\ \mathbf{z}^{-041661} \\$ $0369344 \\ 1036959 \\ 27.05655 \\ 10933177 \\ 153 \\ 28.0430382 \\ 10430382 \\ 1043078 \\ 123.21366 \\ 1090734 \\ 132 \\ 132 \\ 132 \\ 132 \\ 108 \\ 10$ $-0380971 \\ -038124 \\ -038124 \\ -05002 \\ -09327 \\ -05001 \\ -090227 \\ -05001 \\ -05001 \\ -05002 \\ -0500$ $\mathbf{3}, \mathbf{0386786}, \mathbf{038707}, \mathbf{25}, \mathbf{83482}, \mathbf{9992517}, \mathbf{47}, \mathbf{94}, \mathbf{7818}, \mathbf{044326}, \mathbf{223}, \mathbf{30809}, \mathbf{9989968}, \mathbf{26}, \mathbf{551}, \mathbf{0505929}, \mathbf{050657}, \mathbf{19}, \mathbf{74029}, \mathbf{9987194}, \mathbf{9505929}, \mathbf{95059$ $\mathbf{4} \\ -\mathbf{0389692} \\ -\mathbf{0389692} \\ -\mathbf{0289837} \\ -\mathbf{05083837} \\ -\mathbf{05089837} \\ -\mathbf{050899} \\ -\mathbf{050899} \\ -\mathbf{050899} \\ -\mathbf{05089} \\ -\mathbf{05089}$ [5], 0392598], 039290[2545170], 9992290], 45[36], 0453630], 045409[22, 02171], 9989706[24]56], 0511740], 051241[19, 51558], 9986898], 051242022, 02124202, 0212202, 021220202, 021220202, 021220202, 0212202, 02124202 $16|-0395505|-039581|25\cdot26436|-9992176|44|37|-0456536|-045701|21\cdot88125|-9989573|23|57|+0514645|-051532|19-40513|-9986748|-05123|-0514645|-051232|19-40513|-9986748|-05123|-0514645|-051232|19-40513|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05123|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-0586748|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-05723|-057$ $18|0401318|040164|24\cdot89782|9991944|42|39|0462347|046284|21\cdot60563|9989306|21|59|0520455|052116|19\cdot18793|9986447|0464|24\cdot8794|24\cdot8794|24\cdot42|39|0462347|046284|21\cdot60563|9989306|21|59|0520455|052455|052445|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|24\cdot42|2$ Cotang. | Cosine. Sine. Tang. Tang. / / Cosine. | Cotan. Sine. Tang. | Cotang. | Cosine. Sine. Tang. Cotan. Cosine. Sine. 2 Deg. -. 20 0407131 040746 24.54175 9991709 40 Cosine. Sine. Cotang. Tang. 'l'ang. Cotan. Cosine. Sine. 62 9 00 4

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	1	19	18	17	16	15	14	13	12	11	10	6	00.	2	9	5	4	3	62	L	0		-	86.
	Cosine.	-052336(-052407 19-08113 -0986295 60 21 -0584352 -058535 17-08372 -9982912 3941 -0642420 -064375 15-53398 -9979343 19	$-0526264 \\ -0526299 \\ 18 \\ -97552 \\ -9986143 \\ 59 \\ 25 \\ -0587256 \\ -058827 \\ 16 \\ -99895 \\ -99895 \\ -9982742 \\ -88 \\ +2 \\ -064562 \\ -0645627 \\ -15 \\ -6645323 \\ -064667 \\ -15 \\ -664638 \\ -15$	$0529169 \cdot 052991 \\ 18 \cdot 87106 \cdot 9985989 \\ 5823 \cdot 0590160 \cdot 059119 \\ 16 \cdot 91502 \cdot 9982570 \\ 3743 \cdot 0648226 \cdot 064959 \\ 15 \cdot 39427 \cdot 9978968 \\ 17 \cdot 9978968 \\ 18 \cdot 9978968 \\$	$\cdot 0532074 \cdot 053282 \\ 18^{\circ} 76775 \cdot 9985833 \\ 5724 \cdot 0593064 \cdot 059410 \\ 16 \cdot 83191 \cdot 9982398 \\ 3644 \cdot 0651129 \cdot 065251 \\ 15 \cdot 32535 \\ -9978779 \\ 16 \cdot 916 \cdot 10 \\ 16 \cdot 916 \cdot $	$0534979 \\ 0.053574 \\ 18 \\ 0.6556 \\ 0.995680 \\ 56 \\ 25 \\ 10 \\ 56 \\ 56 \\ 56 \\ 56 \\ 56 \\ 56 \\ 56 \\ 5$	$-0537883 \\ -0537883 \\ -053866 \\ 18 \\ -56447 \\ -9985524 \\ 5526 \\ -0598871 \\ -059994 \\ 16 \\ -056994 \\ 16 \\ -065633 \\ -15 \\ -18924 \\ -055835 \\ 15 \\ -18924 \\ -055835 \\ -15 \\ -18924 \\ -055835 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18924 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -18024 \\ -05585 \\ -15 \\ -15 \\ -15 \\ -18024 \\ -180$	$0540788 \cdot 054158 \\ 18 \cdot 46447 \cdot 9985367 \\ 5427 \cdot 0601775 \cdot 060286 \\ 16 \cdot 58739 \cdot 9981877 \\ 13347 \cdot 065938 \\ 066127 \\ 15 \cdot 12224 \\ 19978207 \\ 13847 \cdot 065938 \\ 066127 \\ 15 \cdot 12224 \\ 19978207 \\ 128 \cdot 128 \cdot 128 \\ 128 \cdot 128 \cdot 128 \cdot 128 \\ 128 \cdot 128 \cdot 128 \cdot 128 \cdot 128 \\ 128 \cdot 128 \cdot 128 \cdot 128 \cdot 128 \cdot 128 \\ 128 \cdot 128 \cdot$	$-0543693 \\ -054449 \\ 18 \\ -36553 \\ -9985209 \\ 53 \\ 28 \\ -0604678 \\ -0604578 \\ -0604578 \\ -0604578 \\ -0604578 \\ -0604578 \\ -09780557 \\ -097805 \\ $	$\cdot 0546597 \cdot 054741 \\ 18 \cdot 26765 \cdot 9985050 \\ 5229 \cdot 0607582 \cdot 060870 \\ 16 \cdot 42827 \cdot 9981525 \\ 31149 \cdot 0665641 \cdot 066712 \\ 14 \cdot 9897 \\ 827 \cdot 827 $	$\cdot 0549502 \cdot 055033 \\ 18 \cdot 17080 \cdot 0984891 \\ 51 \\ 30 \cdot 0610485 \\ 061162 \\ 16 \cdot 34985 \\ 0981348 \\ 36 \\ 50 \cdot 0685544 \\ 067004 \\ 14 \cdot 92241 \\ 09977627 \\ 09977627 \\ 00004 \\ 000004 \\ 000004 \\ 00004 \\ 000004 \\ 000004 \\ 000004 \\ 000004 \\ 000004 \\ 000004 \\ 0000004 \\ 00000000$	$0 - 0552406 - 055325 \\ 18 \cdot 07497 + 0984731 \\ 50 \\ 31 + 0613389 - 061454 \\ 16 \cdot 27217 + 0981170 \\ 29 \\ 51 + 0671446 + 067296 \\ 14 \cdot 85961 + 0997433 \\ 20 + 067246 + 067296 \\ 14 \cdot 85961 + 0997433 \\ 20 + 067246 + 067296 \\ 14 \cdot 85961 + 067296 \\$	·9977237	.9977040	.9976843	·9976645	·9976445	·9976245	·9976045	.9975843	·9975641		Sine.	Deg. 8
	Cotang.	15.53398	15-46381	15.39427	15-32535	15-25705	15.18934	15-12224	15-05572	14.98978	14-92441	14.85961	14.79537	14.73167	14.66852	14.60591	14.54383	14-48227	14-42123	14.36069	14.30066		Tang.	
	Tang.	064375	064667	064959	065251	065543	065835	066127	·066419	-066712	-067004	.067296	067588	•067880	.068173	068465	·068757	069049	-069342	069634	069926		Cotan.	
3 Deg.	Sine.	0642420	0645323	0648226	0651129	-0654031	-0656934	·0659836	-0662739	-0665641	-0668544	0671446	·0674349	0677251	·0680153	0683055	0685957	·0688859	0691761	·0694663	0697565		Cosine. Cotan.	2
3	-	41	42	43	$\overline{44}$	15	46	47	18	49	50	51	52	53	54	55	56	57	58	59	30	- 11	1	
	-	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20		1~	86.
	Cosine.	·9982912	·9982742	.9982570	·9982398	·9982225	·9982052	·9981877	1021866.	·9981525	· 9981348	·9981170	1660866.	·9980811	1690866.	-9980450	·9980267	·9980084	0066266.	9179796	9979530		Sine.	Deg.
	Tang. Cotang. Cosine.	17-08372	16-99895	16.91502	16.83191	$16 \cdot 74961$	16.66811	16.58739	16-50745	16-42827	16.34985	16-27217	$-0555311 \\ -055616 \\ 17 \\ -98015 \\ -9984570 \\ 49 \\ 32 \\ -0616292 \\ -0616292 \\ -061746 \\ 16 \\ -19522 \\ -980999 \\ 28 \\ 52 \\ -067434 \\ -067588 \\ 14 \\ -79537 \\ -9977237 \\ -9980991 \\ 28 \\ 52 \\ -067434 \\ -06758 \\ -$	$ [2] \cdot 0558215 \cdot 055908 \\ [17.88631 \cdot 9984408 \\ [48] 33] \cdot 0619196 \cdot 062038 \\ [16\cdot11899 \cdot 9980811 \\ [27] 57 \cdot 0677251 \cdot 067880 \\ [14\cdot73167 \\ [39] 5977040 \\ [30] 512 \cdot 05752 \\ [30] 51$	$[3] 0561119 \\ 056200 \\ 17^{+} 3344 \\ 09824245 \\ 4734 \\ 0622099 \\ 062209 \\ 062230 \\ 062330 \\ 16 \\ 04348 \\ 0980631 \\ 26 \\ 54 \\ 0680153 \\ 0680153 \\ 068173 \\ 14^{+} 66852 \\ 9976843 \\ 068153 \\ 068173 \\ 14^{+} 66852 \\ 068173 \\ 06817$	$14 \cdot 0564024 \cdot 056492 \cdot 17 \cdot 70152 \cdot 9984081 \cdot 46 \cdot 35 \cdot 06255002 \cdot 0626222 \cdot 15 \cdot 96866 \cdot 9980450 \cdot 25 \cdot 55 \cdot 0683055 \cdot 068465 \cdot 14 \cdot 60591 \cdot 9976645 \cdot 14 \cdot $	$16^{\circ}0566928^{\circ}056784^{\circ}17^{\circ}61055^{\circ}9983917^{\circ}45^{\circ}36^{\circ}0627905^{\circ}0622914^{\circ}15^{\circ}89454^{\circ}9980267^{\circ}24^{\circ}56^{\circ}0685957^{\circ}068757^{\circ}14^{\circ}54383^{\circ}9976445^{\circ}68757^{\circ}14^{\circ}54283^{\circ}68757^{\circ}168757^{\circ}14^{\circ}54283^{\circ}68757^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}1687577^{\circ}168757777^{\circ}1687577777777777777777777777777777777777$	$16^{-0569832} \cdot 057075 \\ 17^{+5}2051 \\ \cdot 9983751 \\ 44^{3}77 \\ \cdot 0630808 \\ \cdot 063206 \\ 15^{+}82110 \\ \cdot 9980084 \\ 23^{-7} \\ \cdot 0688859 \\ \cdot 0688859 \\ \cdot 069049 \\ 14^{+}8227 \\ \cdot 9976245 \\ \cdot 9976245 \\ \cdot 9980084 \\ \cdot 23^{-7} \\ \cdot 0688859 \\ \cdot 0688859 \\ \cdot 069049 \\ \cdot 14^{+}8227 \\ \cdot 9976245 \\ \cdot 9976245 \\ \cdot 9976245 \\ \cdot 9980084 \\ \cdot 23^{-7} \\ \cdot 0688859 \\ \cdot 0688859 \\ \cdot 068048 \\ \cdot 068855 \\ \cdot 0688859 \\ \cdot 068856 \\ \cdot 06865 \\ \cdot 06865 \\ \cdot 068656 \\ $	$17 \\ 0572736 \\ 057367 \\ 17 \\ 43138 \\ 0993355 \\ 43]38 \\ 0633711 \\ 063498 \\ 15 \\ 74833 \\ 9979900 \\ 22]58 \\ 0691761 \\ 069342 \\ 14 \\ 42123 \\ 9976045 \\ 12 \\ 4323 \\ 9976045 \\ 12 \\ 4323 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\ 12 \\$	$0575640 \\ 0575640 \\ 057659 \\ 17^{-3}4315 \\ 0983418 \\ 4239 \\ 0636614 \\ 0637614 \\ 063760 \\ 15^{-}67623 \\ 0975843 \\ 0979716 \\ 21 \\ 59 \\ 069465 \\ 069465 \\ 14^{-3}6069 \\ 14^$	$19 \cdot 0578544 \cdot 057951 \cdot 17 \cdot 25580 \cdot 9983256 \cdot 41 \cdot 40 \cdot 0639517 \cdot 064082 \cdot 15 \cdot 60478 \cdot 9979532 \cdot 20 \cdot 35 \cdot 0697565 \cdot 069926 \cdot 14 \cdot 30066 \cdot 9975641 \cdot 12 \cdot $		Tang.	
	Tang.	058535	058827	059119	.059410	·059702	·059994	060286	•060578	028090	061162	061454	061746	·062038	$\cdot 062330$	-062622	062914	-063206	063498	.063790	-064082		Cotan.	
3 Deg.	Sine.	0584352	0587256	0590160	0593064	-0595967	0598871	0601775	0604678	0607582	0610485	0613389	0616292	0619196	0622099	-0625002	0627905	0630808	0633711	0636614	0639517		/ Cosine. Cotan.	
3	`	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	33	39	40		`	
•	-	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	·	36.
	Cosine.	·9986295	·9986143	9985989	·9985835	·9985680	·9985524	·9985367	·9985209	·9985050	·9984891	·9984731	·9984570	·9984408	·9984245	$\cdot 9984081$	·9983917	.9983751	·9983585	·9983418	·9983250	.9983082	Sine.	Deg. 86.
	Tang. Cotang.	19-08113	18-97552	18-87106	18.76775	18-66556	18-56447	18-46447	18-36553	18-26765	18.17080	18-07497	17-98015	17.88631	17.79344	17-70152	17-61055	17-52051	17-43138	17-34315	17-25580	$20 \cdot 0581448 \cdot 058243 17 \cdot 16933 \cdot 9983082 40$	Tang.	
	Tang.	-052407	-052699	052991	.053282	.053574	.053866	-054158	.054449	.054741	.055033	.055325	.055616	055908	.056200	.056492	·056784	057075	·057367	057659	-057951	058243	Cotan.	
3 Deg.	Sine.	.052336(.0526264	.0529169	·0532074	·0534979	·0537883	·0540788	·0543693	·0546597	.0549502	-0552406	.0555311	.0558215	·0561119	·0564024	.0566928	·0569832	0572736	0575640	0578544	0581448	/ Cosine.	
3	-	0	I	63	3	4	2	9	2	00	6	10	11	12	13	14	15	16	17	18	19	20	-	

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4 Deg.

4 Deg.

	100	10	9	K)	14	00	64	-	01	6	8	2	9	5	4	3	62	-	0	-	1	i.
Cosine.	966612 1	9661351	965895 1	965655 1		965172 1	964929 1	964685 1		964195	963948	102896	963453	963204	962954	962704	962452	962200	961947	1100	Sine.	Deg. 85.
	20671 9	·12006 -9	6- 61220-3	3.03462 -9	·99234 -9	· 95037 -9	6-89806-	-86728 -9	1-82616 -9	1-78533 -9	1-74477 -9	-70450 -9	1-66449 -9	1-62176 -9	1-58529 -9	0-24609 -9	0-21202-1	-46847 -9	-43005 -9		Tang.	
Tang. Cotang.	081922 12	082507 12	082800 12	083093 15	083386 11	083679 11	083972 11	084265 11	084558 11	084851 11	085144 11	085437 11	085730 11	086023 11	086316 11	086609 11	086902 11	087195 11	087488 11		L	-
Sine.	816486	822284	825183	1828082 -	0830981 ·	0833880 0	0836778	9839677	0842576	0845474	0848373	9851271	0854169	0857067	9966680	0862864	0865762	9868660	0871557		/ / Cosine. Cotan.	ARTES -
,	941 (743 .	644 .	545 .	446 .	347 .	248 .	1 49 -0	050 -0	951 -	8 52 .	7 53 .	6 54 .	555 -	4 56 .	357 .	2 58 .	1 59 .	090		-	
Cosine.	$0 \cdot 0.697565 \cdot 0.69926 \left[14 \cdot 30066 \cdot 9975641 \left[60/21 \right] \cdot 0.758489 \cdot 0.76068 \left[13 \cdot 14612 \cdot 0.9971 193 \right] 39/41 \right] \cdot 0.816486 \cdot 0.81922 \left[12 \cdot 20671 \right] \cdot 9966612 \left[19 \cdot 0.8071 \right] \cdot 0.8070 \cdot 0.8$	-0703368 -070511 14-18209 -0975233 5823 -0764290 -076653 13.04576 -0970750 3743 -0822284 -082507 12-12006 -0966135 17	$-0.706270 \\ -0.70803 \\ 14 \\ -12353 \\ -9975028 \\ 5724 \\ -0.76719 $	$-0709171 \\ +071096 \\ 14 \\ +06545 \\ +9974822 \\ +5625 \\ +0770091 \\ +077238 \\ +077238 \\ +07692 \\ +996665 \\ +0370304 \\ +3545 \\ +0828082 \\ +0828082 \\ +0828083 \\ +0828082 \\ +082808082 \\ +0828082 \\ +0828082 \\ +0828082 \\ +0828082 \\ +0828082 \\ +0828$	$0712073 \cdot 071388 \\ 14 \cdot 00785 \cdot 9974615 \\ 5526 \cdot 0772991 \cdot 077531 \\ 12 \cdot 89805 \cdot 9970080 \\ 34 \\ 46 \cdot 0830981 \cdot 083386 \\ 11 \cdot 99234 \\ 99234 \\ 9965414 \\ 12 \cdot 99565 \\ 12 \cdot 997068 \\ 12 \cdot 997068 \\ 12 \cdot 99708 \\ 11 \cdot 99708 \\ 12 \cdot 9$	$\cdot 0714974 \cdot 071680 \\ 13 \cdot 95071 \cdot 9974408 \\ 5427 \cdot 0775891 \cdot 077582 \\ 12 \cdot 84955 \cdot 9969854 \\ 3347 \cdot 0833880 \cdot 083679 \\ 11 \cdot 95037 \cdot 9965172 \\ 12 \cdot 996517 \\ 12 \cdot 9969854 \\ 3347 \cdot 0833880 \\ 3347 \cdot 0833880 \\ 3347 \cdot 0833880 \\ 347 \cdot 083880 \\ 347 \cdot 08380 \\ 34$	$0.717876 \\ \cdot 0.71973 \\ \cdot 13 \\ \cdot 99404 \\ \cdot 9974199 \\ \cdot 5328 \\ \cdot 0.778791 \\ \cdot 0.78791 \\ \cdot 0.78791 \\ \cdot 0.78116 \\ \cdot 12 \\ \cdot 0.111 \\ \cdot 9969628 \\ \cdot 3248 \\ \cdot 0.936778 \\ \cdot 0.836778 \\ \cdot 0.83778 \\ \cdot 0.93778 \\ \cdot $	$0.720777 \cdot 0.72265 \cdot 13 \cdot 83782 \cdot 9973990 \cdot 5229 \cdot 0.781691 \cdot 0.78409 \cdot 12 \cdot 75363 \cdot 9969401 \cdot 31 \cdot 49 \cdot 0.84265 \cdot 11 \cdot 86728 \cdot 9964685 \cdot 12 \cdot 1$	$ 0.723678 \cdot 0.72558 \cdot 13^{\circ} 78206 \cdot 9973780 \cdot 5130 \cdot 0.784591 \cdot 0.78701 \cdot 12^{\circ} 70620 \cdot 9969173 \cdot 3050 \cdot 0.842576 \cdot 0.84558 \cdot 11^{\circ} 82616 \cdot 9964440 \cdot 12^{\circ} 1$	$0 \cdot 0726580 \cdot 072850 \cdot 072850 \cdot 0973569 \cdot 0973569 \cdot 50 \cdot 31 \cdot 0787491 \cdot 078994 \cdot 12 \cdot 65912 \cdot 9968945 \cdot 2951 \cdot 0845474 \cdot 084851 \cdot 11 \cdot 78533 \cdot 9964195 \cdot 12653 \cdot 126533 \cdot 12653 \cdot 12653 \cdot 12653 \cdot 12653 \cdot 12653 \cdot 126533 \cdot 126533 \cdot $	$1 \cdot 0.729481 \cdot 0.731431 \cdot 0.848373 \cdot 9973357 \cdot 4932 \cdot 0.790391 \cdot 0.79287 \cdot 12 \cdot 61239 \cdot 9968715 \cdot 2852 \cdot 0.848373 \cdot 0.85144 \cdot 11 \cdot 74477 \cdot 9963948 \cdot 12 \cdot 61239 \cdot 9968715 \cdot 2852 \cdot 0.848373 \cdot 0.85144 \cdot 11 \cdot 74477 \cdot 9963948 \cdot 12 \cdot 61239 \cdot 9968715 \cdot 2852 \cdot 0.848373 \cdot 0.85144 \cdot 11 \cdot 74477 \cdot 9963948 \cdot 12 \cdot 61239 \cdot 9968715 \cdot 2852 \cdot 0.848373 \cdot 0.85144 \cdot 11 \cdot 74477 \cdot 9963948 \cdot 12 \cdot 61239 \cdot 9968715 \cdot 2852 \cdot 12 \cdot 61239 \cdot $	$2^{0} \\ 0$	$(3 \cdot 0735283 \cdot 073727) \\ 13 \cdot 56339 \cdot 9972931 \\ 4734 \cdot 0796190 \cdot 079872 \\ 12 \cdot 51994 \cdot 9968254 \\ 26646 \cdot 9968254 \\ 26674 \cdot 6968254 \\ 26674 + 6968254 \\ 266$	$(4^{\circ} 0738184^{\circ} 074020^{\circ} 13^{\circ} 50979^{\circ} 9972717^{\circ} 46^{\circ} 35^{\circ} 0799909^{\circ} 080165^{\circ} 12^{\circ} 47422^{\circ} 9968022^{\circ} 25^{\circ} 55^{\circ} 5$	$ 5^{\circ}0741085 \cdot 074312 \left[13 \cdot 45662 \cdot 9972502 \left[45 \right] 36 \cdot 0801989 \cdot 080458 \left[12 \cdot 42883 \cdot 9967789 \right] 24 \left[56 \cdot 0859966 \right] \cdot 0859966 \left[086316 \right] 11 \cdot 58529 \cdot 9962954 \left[12 \cdot 42883 \cdot 9967789 \right] = 100000000000000000000000000000000000$	$(6^{\circ}0743986^{\circ}074605^{\circ}13\cdot40386^{\circ}9972286^{\circ}44^{\circ}37^{\circ}0804889^{\circ}080750^{\circ}12\cdot38376^{\circ}9967555^{\circ}23^{\circ}57^{\circ}0862864^{\circ}086609^{\circ}11\cdot54609^{\circ}9962704^{\circ}086609^{\circ}11\cdot54609^{\circ}$	$ (7 \cdot 0746887 \cdot 074697 \mid 13 \cdot 35151 \mid 9972069 \mid 43 \mid 38 \mid 0807788 \mid 081043 \mid 12 \cdot 33902 \mid 9967321 \mid 22 \mid 58 \mid 0865762 \mid 086902 \mid 11 \cdot 50715 \mid 9962452 \mid 22 \mid 58 \mid 0865762 \mid 086902 \mid 11 \cdot 50715 \mid 9962452 \mid 22 \mid 58 \mid 0865762 \mid 08657622 \mid 086576221111111111111111111111111111111111$	$[8] \cdot 0749787 \cdot 075190 \\ 13 \cdot 29957 \cdot 9971851 \\ 42 \\ 39 \cdot 0810687 \\ 10810887 \\ 1081336 \\ 112 \cdot 29460 \\ -9967085 \\ 21 \\ 59 \cdot 0868660 \\ -0868660 \\ -087195 \\ 11 \cdot 46847 \\ -9962200 \\ -9962200 \\ -9967085 \\ -99670$	$19 \cdot 0752688 \cdot 075482 \cdot 13 \cdot 24803 \cdot 9971633 \cdot 41 \cdot 40 \cdot 0813587 \cdot 081629 \cdot 12 \cdot 25050 \cdot 9966849 \cdot 20 \cdot 60 \cdot 0871557 \cdot 087488 \cdot 11 \cdot 43005 \cdot 9961947 \cdot 12005 \cdot 9961967 \cdot 12005 \cdot 9961967 \cdot 12005 \cdot 9961967 \cdot 12005 \cdot 12005 \cdot 9961967 \cdot 12005 \cdot 12005 \cdot 9961967 \cdot 12005 \cdot 12005 \cdot 9961967 \cdot 12005 \cdot$		Sine.	Deg. 85.
Cotang. Cosine.	3.14612	3.04576	2-99616	2.94692	2.89805	2.84955	2.80141	2.75363	2-70626	2-65912	2-61239	2.56599	2.51994	2.47422	2.42883	2.38376	2.33902	2.29460	2.25050		Tang.	Contraction of
Tang.	1 890920-	0766533	076945 1	077238	077531	077823	078116	078409	078701	-078994	-079287	079579	079872	080165	080458	022080-	081043	0813361	081629	1012	Cotan.	Nation State
Sine.	0758489	0764290	0767190	1600270.	0772991	0775891	16787791	·0781691	0784591	·0787491	0790391	·0793290	·0796190	0606620.	·0801989	$\cdot 0804889$	·0807788	·0810687	·0813587		/ / Cosine.	1.112
11	5021	5823	5724	56 25	55 26	5427	5328	52 29	5130	5031	1932	1833	1734	1635	15 36	14 37	13 38	12 39	1140	10	-	0.
Cosine.	9975641	9975233	9975028	9974822	9974615	9974408	9974199	0668266	9973780	9973569	9973357	9973145	1662766	7172709	9972502	9972286	9972069	1681799	9971633	20 0755589 075775 13.19688 9971413 40	Sine.	Deg. 85.
Cotang. Cosine.	14-30066	14-18209	14-12353	14.06545	14.00785	13-95071	13-89404	13.83782	13.78206	13-72673	13.67185	13.61740	13.56339	13.50979	13-45662	13-40386	13.35151	13.29957	13.24803	13-19688	Tang.	
Tang.	069926	112040.	•070803	-071096	•071388	.071680	•071973	.072265	.072558	.072850	·073143	•073435	-073727	-074020	·074312	-074605	-074897	061220.	-075482	075775	Cotan.	
Sine.	0697565	0103368	0706270	1710070-	·0712073	·0714974	0717876	7770270-	·0723678	0726580	·0729481	.0732382	-0735283	·0738184	0741085	·0743986	0746387	·0749787	0752688	•0755589	Cosine. Cotan.	
-	0-	1 62	3	4	2	9	2	00	6	10	11	12	13	14	15	16	17	18	19	20	-	

43

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5 Deg.

5 Deg.

5 Deg.

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1	19	18
 | 15 | 14 | 13
 | 12 | 11 | 10 | 6
 | 00 | 2 | 9 | 5
 | 4 | က | 63 | 1
 | 0 | | - | 34. |
| Cosine. | -9950844 | ·9950556 | ·9950266 | ·9949976
 | ·9949685 | .9949393 | ·9949101
 | ·9948807 | ·9948513 | -9948217 | .9947921
 | ·9947625 | ·9947327 | ·9947028 | .9946729
 | ·9946428 | ·9946127 | -9945825 | ·9945523
 | .9945219 | | Sine. | Deg. 84. |
| Cotang. Cosine. | 10.04828 | 10.01871 | 9-989305 | 9-960072
 | 9-931008 | 9-902112 | 9-873382
 | 9.844816 | 9-816414 | 9-788173 | 9.760092
 | 9-732171 | 9.704407 | 008929.6 | 9.649347
 | 9.622048 | 9-594902 | 9.567906 | 9-541061
 | 9.514364 | | Tang. | |
| Tang. | 099519 | ·099813 | ·100107 | $\cdot 100400$
 | $\cdot 100694$ | $\cdot 100988$ | $\cdot 101282$
 | ·101576 | ·101870 | $\cdot 102164$ | 102458
 | 102752 | $\cdot 103046$ | ·103339 | $\cdot 103634$
 | ·103928 | $\cdot 104222$ | $\cdot 104516$ | $\cdot 104810$
 | $\cdot 105104$ | | Cotan. | |
| Sine. | .0990303 | ·0993197 | ·0996092 | 099898986
 | $\cdot 1001881$ | $\cdot 1004775$ | 0007669
 | $\cdot 1010563$ | $\cdot 1013457$ | 1016351 | .1019245
 | .1022138 | .1025032 | 1027925 | ·1030819
 | 1033712 | -1036605 | 1039499 | -1042392
 | -1045285 | | / Cosine. Cotan. | |
| - | 41 | 42 | 43 | 44
 | 45 | 46 | 47
 | 48 | 49 | 50 | 51
 | 52 | 53 | 54 | 55
 | 56 | 57 | 28 | 201
 | 60 | | - | |
| ~ | 39 | 38 | 37 | 36
 | 35 | 34 | 33
 | 32 | 31 | 30 | 29
 | 28 | 27 | 26 | 25
 | 24 | 23 | 22 | 21
 | 20 | | 1- | 84 |
| Cosine. | ·9956437 | ·9956165 | .9955892 | 9955620
 | ·9955345 | 9955070 | ·9954794
 | .9954517 | 9954240 | -9953962 | .9953683
 | .9953403 | 9953122 | 9952840 | 9952557
 | 9952274 | 9951990 | 6071699 | 9951419
 | 9951132 | | Sine. | Deg. 84. |
| Tang. Cotang. Cosine. | $0 \cdot 0871557 \cdot 087488 \\ 11 \cdot 43005 \cdot 9961947 \\ 6021 \cdot 0932395 \cdot 093647 \\ 10 \cdot 67834 \cdot 9956437 \\ 3956437 \\ 39511 \cdot 0990303 \cdot 099519 \\ 10 \cdot 04828 \cdot 9950844 \\ 19 \cdot 0990303 \cdot 099519 \\ 10 \cdot 04828 \cdot 9950844 \\ 10 \cdot 08768 + 10 \cdot 08768 \\ 10 \cdot 08768 + 10 \cdot 0876$ | $0874456 \\ 087781 \\ 11 \\ \cdot 39188 \\ \cdot 9961693 \\ 5922 \\ \cdot 0935291 \\ \cdot 093542 \\ \cdot 093344 \\ 0 \\ \cdot 0.6449 \\ \cdot 9956165 \\ \cdot 3842 \\ \cdot 099319 \\ \cdot 009313 \\ \cdot 009313 \\ \cdot 009813 \\ \cdot 000913 \\ \cdot 00091$ | $-0877353 \\ \cdot 098074 \\ 111 \\ \cdot 35397 \\ \cdot 9961438 \\ \cdot 5823 \\ \cdot 09338187 \\ \cdot 094234 \\ 10 \\ \cdot 61184 \\ \cdot 9955892 \\ \cdot 3743 \\ \cdot 995692 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 993305 \\ \cdot 9950266 \\ 117 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 993305 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 \\ \cdot 9950266 \\ \cdot 100107 \\ \cdot 9 $ | $-0880251 \\ -088368 \\ 11 \\ -31630 \\ -9961183 \\ 57/24 \\ -0941083 \\ -094257 \\ 10 \\ -57889 \\ -995562 \\ -995562 \\ -36444 \\ -0998986 \\ -100400 \\ -9960072 \\ -9949976 \\ -100400 \\ -9960072 \\ -9949976 \\ -100400 \\ -9060072 \\ -9949976 \\ -100400 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9060072 \\ -9949976 \\ -9960072 \\ -9949976 \\ -9960072 \\ -9960$ | $0883148 \cdot 088661 \cdot 11 \cdot 27888 \cdot 9960926 \cdot 56 \cdot 25 \cdot 0943979 \cdot 094821 \cdot 10 \cdot 54615 \cdot 9955345 \cdot 35 \cdot 4561 \cdot 1001881 \cdot 100694 \cdot 9 \cdot 31008 \cdot 9949685 \cdot 15 \cdot 1001881 \cdot 100694 \cdot 1$ | $0886046 \left[088954 \left[11 \cdot 24171 \right] \cdot 9960669 \left[55 \left[26 \right] \cdot 0946875 \right] \cdot 095114 \left[10 \cdot 51360 \right] \cdot 9955070 \left[34 \left[46 \right] \cdot 1004775 \left[\cdot 100988 \right] \cdot 9902112 \right] \cdot 9349393 \left[14 \cdot 1004775 \right] \cdot 1004775 \left[1004775 \right] \cdot 1004775 \left[1004775 \right] \cdot 1004775 \right] \cdot 1004775 \left[100775 \right] \cdot 100475 \left[100775 \left[100775 \right] \cdot 100475 \left[100775 \right] \cdot 100475 \left[100775 \left[100775 \right] \cdot 100475 \left[100775 \left[100775 \right] + 100775 \left[100775 \right] \cdot 100475 \left[100775 \right] + 100775 \left[100775 \left[100775 \right] + 100775 \left[100775 \left[100775 \right] + 100775 \left[100775 \right] + 100775 \left[100775 \left[100$ | $0888943 \cdot 089247 \\ 111 \cdot 20478 \cdot 9960411 \\ 54 \\ 271 \cdot 0949771 \cdot 095408 \\ 10 \cdot 48126 \cdot 9954794 \\ 33 \\ 47 \cdot 1007669 \cdot 101282 \\ 9 \cdot 873382 \cdot 9949101 \\ $ | $-0891840 \\ \cdot 089540 \\ 11 \\ \cdot 16808 \\ \cdot 9960152 \\ \cdot 5328 \\ \cdot 0952666 \\ \cdot 095701 \\ 10 \\ \cdot 44911 \\ \cdot 9954517 \\ \cdot 3248 \\ \cdot 1010563 \\ \cdot 101576 \\ \cdot 9844816 \\ \cdot 9948807 \\ \cdot 1225 \\ \cdot 1010563 \\ \cdot 101576 \\ \cdot 1010563 \\ \cdot 101576 \\ \cdot 1010563 \\ \cdot$ | $0894738 \\ 089834 \\ 11 \\ 11 \\ 13163 \\ 9959828 \\ 2995562 \\ 0955562 \\ 0955562 \\ 095995 \\ 10 \\ 41715 \\ 9954240 \\ 31 \\ 49 \\ 1013457 \\ 101870 \\ 9981641 \\ 9981651 \\ 39828 \\ 1013457 \\ 101870 \\ 9981641 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1013457 \\ 101870 \\ 1018$ | $9 \cdot 0897635 \cdot 090127 \\ 11 \cdot 09541 \cdot 095631 \\ 51 \\ 30 \cdot 0958458 \cdot 096289 \\ 10 \cdot 38539 \cdot 9953962 \\ 30 \\ 50 \cdot 1016351 \cdot 102164 \\ 9 \cdot 788173 \cdot 9948217 \\ 10 \cdot 38539 \cdot 9953962 \\ 30 \\ 50 \cdot 1016351 \cdot 102164 \\ 10 \cdot 1021$ | $10^{+}0900532^{+}090420^{+}11^{+}05943^{+}9959370^{+}50^{+}31^{+}0961353^{+}096582^{+}10^{-}35382^{+}9953683^{+}29^{+}51^{+}1019245^{+}102458^{+}9^{-}760092^{+}997921^{+}1019245^{+}101925^{+}1019$ | 11, 0903429, 090713, 11, 02367, 0959107, 4932, 0964248, 096876, 10, 32244, 0953403, 2852, 1022138, 102752, 9732171, 0947625, 09 | $\textbf{z} \cdot 0906326 \cdot 091007 \mid 10 \cdot 98315 \cdot 9958844 \mid \textbf{48} \mid \textbf{33} \cdot 0967144 \cdot 097169 \mid 10 \cdot \textbf{29} \mid \textbf{25} \mid \textbf{9953} \mid \textbf{22} \mid \textbf{27} \mid \textbf{27} \mid \textbf{27} \mid \textbf{327} \mid \textbf{1025} \mid \textbf{327} \mid \textbf{327}$ | $ [3] \cdot 0909223 \cdot 091300 10 \cdot 95285 \cdot 9958580 47 34 \cdot 0970039 \cdot 097463 10 \cdot 26024 \cdot 9952840 26 54 \cdot 1027925 \cdot 103339 9 \cdot 676800 \cdot 9947028 \cdot 1027925 \cdot 103339 9 \cdot 676800 \cdot 9947028 \cdot 1027925 \cdot 102$ | $14 + 0912119 + 091593 + 10 \cdot 91777 + 9958315 + 46 \\ 35 + 0972934 + 097757 + 10 \cdot 22942 + 9952557 + 2555 + 1030819 + 103634 + 9 \cdot 649347 + 9945729 + 1030819 + 103634 + 103644 + 10364$ | $15 \cdot 0915016 \cdot 091587 \\ 10 \cdot 82292 \cdot 9958049 \\ 45 \\ 36 \cdot 0975829 \cdot 098050 \\ 10 \cdot 19878 \cdot 9952274 \\ 24 \\ 56 \\ 5 \cdot 1033712 \cdot 103328 \\ 9 \cdot 622048 \cdot 9952274 \\ 24 \\ 56 \\ 5 \cdot 1033712 \cdot 103328 \\ 9 \cdot 622048 \cdot 9956274 \\ 5 \cdot 1033712 \cdot 103328 \\ 9 \cdot 622048 \cdot 9956274 \\ 10 \cdot 103712 \cdot 103328 \\ 10 \cdot 103228 \\ 10 \cdot 10328 \\ 1$ | $16 \cdot 0917913 \cdot 092180 \cdot 10 \cdot 84828 \cdot 9957783 \cdot 44 \cdot 37 \cdot 0978724 \cdot 098344 \cdot 10 \cdot 16833 \cdot 9951990 \cdot 23 \cdot 57 \cdot 1036605 \cdot 104222 \cdot 9564902 \cdot 9946127 \cdot 1036605 \cdot 104222 \cdot 9564902 \cdot 9946127 \cdot 1036605 \cdot 104222 \cdot 9564902 \cdot 9564602 \cdot 9564602 \cdot 95666 \cdot 956666 \cdot 95666 \cdot 95666 \cdot 956666 \cdot 95666 \cdot 95666 \cdot 95666 \cdot 956666 \cdot 95666$ | $17(-0920809) \cdot 092473 10\cdot 81387 \cdot 9957515 43 38 \cdot 0981619 \cdot 098638 10\cdot 13805 \cdot 9951705 2258 \cdot 1039499 \cdot 104516 9\cdot 567906 \cdot 9945825 10\cdot 13805 \cdot 104516 10\cdot 104516 100-104516 100-104516 10\cdot 104516 100-104516 100-104516 100-104516 100-104516 10$ | $18 \cdot 0923706 \cdot 092767 \left[10 \cdot 77967 \cdot 9957247 \left[42 \right] 39 \cdot 0984514 \cdot 098932 \left[10 \cdot 10795 \right] \cdot 9951419 \left[21 \right] 591 \cdot 1042392 \cdot 104810 \left] 9 \cdot 541061 \left[9945523 \cdot 102810 \right] = 100000000000000000000000000000000000$ | $19 \cdot 0926602 \cdot 093060 \\ 10 \cdot 74568 \cdot 9956978 \\ 41 \\ 40 \cdot 0987408 \cdot 099225 \\ 10 \cdot 07803 \cdot 9951132 \\ 20 \\ 60 \\ 10 \\ 45143 \\ 945219 \\ 945219 \\ 945219 \\ 105104 \\ 105104 \\ 951436 \\ 105104 \\ 10510$ | | Tang. | |
| Tang. | 093647 | -093940 | $\cdot 094234$ | ·094527
 | $\cdot 094821$ | 095114 | $\cdot 095408$
 | 005701 | ·095995 | .096289 | ·096582
 | 096876 | ·097169 | ·097463 | 767760-
 | 0308050 | ·098344 | .098638 | ·098932
 | ·099225 | | Cotan. | |
| Sine. | .0932395 | ·0935291 | ·0938187 | -0941083
 | ·0943979 | ·0946875 | 0949771
 | ·0952666 | ·0955562 | ·0958458 | ·0961353
 | ·0964248 | ·0967144 | 6800260. | ·0972934
 | 0975829 | ·0978724 | ·0981619 | ·0984514
 | ·0987408 | | Cosine. Cotan. | |
| - | 21 | 22 | 23 | 24
 | 25 | 26 | 27
 | 28 | 29 | 30 | 31
 | 32 | 33 | 34 | 35
 | 36 | 37 | 38 | 39
 | 40 | | - | |
| - | 60 | 59 | 58 | 57
 | 56 | 55 | 54
 | 53 | 52 | 51 | 50
 | 49 | 48 | 47 | 46
 | 45 | 44 | 43 | 42
 | 41 | 40 | ~ | 84 |
| Cosine. | -9961947 | ·9961693 | -9961438 | ·9961183
 | ·9960926 | ·996066 | .9960411
 | ·9960152 | ·9959892 | ·9959631 | ·9959370
 | ·9959107 | ·9958844 | ·9958580 | ·9958315
 | -9958049 | ·9957783 | ·9957515 | ·9957247
 | ·9956978 | ·9956708 | Sine. | Deg. 84. |
| Tang. Cotang. | 11.43005 | 11.39188 | 11-35397 | 11.31630
 | 11-27888 | 11-24171 | 11.20478
 | 11.16808 | 11-13163 | 11.09541 | 11.05943
 | 11-02367 | 10.98815 | 10-95285 | 77710-01
 | 10-88292 | 10-84828 | 10.81387 | 10.77967
 | 10.74568 | $20 \cdot 0929499 \cdot 093354 \cdot 10.71191 \cdot 9956708 \cdot 40$ | Tang. | |
| Tang. | .087488 | ·087781 | ·088074 | ·088368
 | ·088661 | ·088954 | ·089247
 | ·089540 | 089834 | 090127 | 090420
 | ·090713 | 200160- | 001300 | .091593
 | ·091887 | 092180 | ·092473 | 1002767
 | 090860 | ·093354 | Cotan. | |
| Sine. | 0871557 | 0874455 | 0877353 | 0880251
 | 0883148 | 0886046 | 0888943
 | 0891840 | 0894738 | 0897635 | 0900532
 | 0903429 | 0906326 | 0909223 | 0912119
 | 0915016 | 0917913 | 0920809 | 0923706
 | 0926602 | 0929499 | / Cosine. Cotan. | |
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 | 4 | 20 | .9
 | 2 | 00 | 6 | 10
 | 11 | 12 | 13 | 14
 | 15 | 16 | 17 | 18
 | 19 | 20 | 1- | |

6 Deg.

6 Deg.

NATURAL SINES AND TANGENTS TO A RADIUS 1.

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	Tang.	821711.	·117473	117767	.118062	.118357	.118652	·118947	.119242	.119537	·119832	.120127	.120423	120718	.121013	.121308	.121603	.121898	122194	.122489	.122784		Cotan.	
	Sine.	1163818	1166707	1169596	1172485	1175374	1178263	1181151	1184040	1186928	0186811	1192704	1195593	1198481	1201368	1204256	1207144	1210031	1212919	1215806	1218693		Cosine. Cotan.	
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	Cotang.	8-985984	8-962266	8-938672	8-915200	8-891850	S-868620	8-845510	8.822518	8.799644	8.776887	8.754246	8-731719	8-709307	8.637008	8-664922	8-642747	8-620783	8-598929	8-577183	8-555546		Tang.	C MARINE I
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	Sine.	1045285	1048178	1051070	1053963	1056856	1059748	1062641	1065533	1068425	1071318	1074210	1077102	1079994	1082885	1085777	6998801	0921601	1094452	1097343	1100234	1103126	Cosine. Cotan.	
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| | Cosine. | $\frac{1218698}{122784} + \frac{1}{122784} + \frac{9925462}{9925462} + \frac{1}{1279302} + \frac{1}{128990} + \frac{1}{7752536} + \frac{9917832}{9917832} + \frac{1}{1336979} + \frac{1}{1336979} + \frac{1}{1336979} + \frac{1}{1238697} + \frac{1}{123867} + \frac{1}{1238697} + \frac{1}{123867} + \frac{1}{$ | $-221581-123079\\ 8-124807-9925107-5922-1282186-129235\\ 7734802-9917459-3842-1339862-135205\\ 7386159-9909832-129235-72366-129235-12925-129-12025-12925-12925-12925-12925-12925-12925-$ | $-1224468 \cdot 123375 \cdot 105359 \cdot 9924751 \\ 58 \\ 23 \cdot 1255071 \cdot 129581 \cdot 7.717148 \cdot 9917086 \\ 37 \\ 43 \cdot 1342744 \cdot 135501 \cdot 7.379990 \cdot 9909442 \\ 17 \cdot 77956 \\ 17 \cdot 77956 \\ 17 \cdot 7796 \\ 17 \cdot 7796 \\ 17 \cdot 779 \\ 18 \cdot 128 \cdot 128$ | $ \cdot 1227355 \cdot 123670 8 \cdot 086004 9 \cdot 9924394 57 24 \cdot 1287956 \cdot 129877 7 \cdot 699573 \cdot 9916712 36 44 \cdot 1345627 \cdot 135797 7 \cdot 363891 \cdot 9909051 16 16 16 16 16 16 16 $ | $ \cdot 1230241 \cdot 123965 8 \cdot 066739 \cdot 9924037 \\ \cdot 56826 \cdot 1290841 \cdot 130173 \\ \cdot 7682076 \cdot 9916337 \\ \cdot 35456 \cdot 134569 \cdot 136094 \\ \cdot 136094 \\ \cdot 136094 \\ \cdot 1360861 \\ \cdot 9908659 \\ \cdot 1566 \\ \cdot 13669 \\ \cdot 1566 \\ \cdot 1366 \\ \cdot 1$ | $\cdot 1233128 \cdot 124261 \cdot 8 \cdot 047564 \cdot 9923679 \cdot 5526 \cdot 1293725 \cdot 130469 \cdot 7 \cdot 664658 \cdot 9915961 \cdot 34466 \cdot 1351392 \cdot 136390 \cdot 7 \cdot 331898 \cdot 9908266 \cdot 1466 \cdot 12666 \cdot 126666 \cdot 12666 \cdot 12666 \cdot 126666 \cdot 12666 \cdot 12666 \cdot 126666 \cdot 12666 \cdot 126$ | $6 \cdot 1236015 \cdot 124556 \cdot 8 \cdot 028479 \cdot 9923319 \cdot 5427 \cdot 1296609 \cdot 130764 \cdot 7647317 \cdot 9915584 \cdot 33477 \cdot 1354274 \cdot 136686 \cdot 7316004 \cdot 9907873 \cdot 138477 \cdot 138477 \cdot 1384877 \cdot 138477 \cdot 1384877 \cdot 138477 \cdot 1384777 \cdot 1387777 \cdot 1387777 \cdot 1387777 \cdot 1387777 \cdot 13877777 \cdot 13877777 \cdot 13877777 \cdot 138777777777777777777777777777777777777$ | $\cdot 1238901 \cdot 124352 \cdot 8 \cdot 009483 \cdot 9922959 \cdot 5328 \cdot 1299494 \cdot 131060 \cdot 7 \cdot 630053 \cdot 9915206 \cdot 3248 \cdot 1357156 \cdot 136983 \cdot 7300178 \cdot 9907478 \cdot 125756 \cdot 1257575 \cdot 1257575 \cdot 12575757575757575757575757575757577577577$ | $8 \cdot 1241738 \cdot 1251477990575 \cdot 9922599 5229 \cdot 1302378 \cdot 131356 \\ 7 \cdot 612865 \cdot 9914328 \\ 31149 \cdot 1360038 \cdot 137279 \\ 7 \cdot 284418 \cdot 9907083 \\ 11 \cdot 385147 \\ 3 \cdot 38517 \\ $ | $9 \cdot 1244674 \cdot 125442 \cdot 971755 \cdot 9922237 \cdot 5130 \cdot 1305262 \cdot 131652 \cdot 7695754 \cdot 9914449 \cdot 3050 \cdot 1362919 \cdot 137575 \cdot 7268725 \cdot 9906687 \cdot 100000 \cdot 100000 \cdot 10000 \cdot 100000 \cdot 10000 \cdot 100000 \cdot$ | 9906290 | $11 \cdot 1250446 \cdot 126033 \cdot 7934375 \cdot 9921511 \cdot 4932 \cdot 1311030 \cdot 132244 \cdot 7561756 \cdot 9913688 \cdot 2852 \cdot 1368683 \cdot 138168 \cdot 7237537 \cdot 9905893 \cdot 138168 \cdot 128038 \cdot $ | ·9905494 | $13 \cdot 12562 \\ 36 \cdot 126624 \\ 7 \cdot 897339 \cdot 9920782 \\ 4734 \cdot 1316797 \cdot 132836 \\ 7 \cdot 528057 \cdot 9912923 \\ 2654 \cdot 1374445 \cdot 138761 \\ 7 \cdot 206611 \\ 7 \cdot 9905095 \\ 9 \cdot 12667 \\ 7 \cdot 9912923 \\ 7 \cdot 9912923 \\ 2 \cdot 12676 \\ 1 \cdot 12667 \\ 1 \cdot 1267 \\ 1 \cdot 12667 \\ 1 \cdot 1267 $ | .9904694 | ·9904293 | 1686066. | .9903489 | ·9903085 | -9902681 | | Sine. |
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| | 'l'ang. | .134909 | ·135205 | ·135501 | 135797 | $\cdot 136094$
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 | .139651 | ·139947 | $\cdot 140244$ | $\cdot 140540$
 | | Cotan. |
| 7 Deg. | Sine. | .1336979 | 1339862 | $\cdot 1342744$ | $\cdot 1345627$ | 1348509
 | $\cdot 1351392$ | ·1354274 | .1357156 | $\cdot 1360038$
 | $\cdot 1362919$ | ·1365801 | ·1368683 | ·1371564
 | ·1374445 | -1377327 | .1380208
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 | | / / Cosine. Cotan. |
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| | Cosine. | .9917832 | ·9917459 | 9802166. | .9916712 | ·9916337
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 | .9912923 | 9912540 | .9912155
 | .9911770 | ·9911384 | 7660166. | 0190166.
 | | Sine. |
| | Cotang. | 7-752536 | 7.734802 | 7.717148 | 7-699573 | 7-682076
 | 7-664658 | 7.647317 | 7.630053 | 7.612865
 | 7-595754 | 7.578717 | 7-561750 | 7-544869
 | 7-528057 | 7-511317 | 7-494651
 | 7-478057 | 7-461535 | 7-445085 | 7.428706
 | | Tang. |
| | Tang. | .128990 | .129285 | ·129581 | .129877 | .130173
 | $\cdot 130469$ | ·130764 | $\cdot 131060$ | ·131356
 | 131652 | ·131948 | .132244 | 132540
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 | | Cotan. |
| 7 Deg. | Sine. | .1279302 | .1282186 | .1285071 | .1287956 | $\cdot 1290841$
 | .1293725 | 1296609 | .1299494 | ·1302378
 | 1305262 | ·1308146 | 1311030 | ·1313913
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 | 55 | 54 | 53 | 52
 | 51 | 50 | 49 | 48
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| | Cosine. | -9925465 | .9925107 | -992475] | ·9924394 | ·9924037
 | ·9923679 | ·9923319 | ·9922956 | ·9922599
 | -9922237 | -9921874 | -992151 | .9921147
 | -9920785 | -9920416 | -9920049
 | .9919685 | -9919314 | -9918944 | -9918574
 | ·991820 | Sine. |
| | Cotang. | 8.144346 | 8.124807 | 8.105359 | 8.086004 | 8.066739
 | 8.047564 | 8.028479 | 8.009483 | 7 990575
 | 7-971755 | 7-953022 | 7-934375 | 7-915815
 | 7-897339 | 7.878948 | 7.860642
 | 7.842419 | 7.824279 | 7-806221 | 7.788245
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| | Tang. | .122784 | .123079 | .123375 | .123670 | .123965
 | .124261 | .124556 | .124852 | .125147
 | .125442 | .125738 | .126033 | .126329
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 | .1244674 | .1247560 | .1250446 | .1253332
 | .1256218 | .1259104 | .1261990
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| Tang. | 52723 6. | 2000100 | 0 120001 | 153319/6 | 53617 6. | 53914 6.
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| Sine. | 101 100 100 100 100 100 100 100 100 100 | 0000011 | 91 6665006. 6Z00000.0 1Z00001. 2000Z101. Z2002 2/022686. 9022661.9 Z10141. C/00041. ZZ660 0.ZZ666. Z82001.1 2280 1. 21940. 2 | $\cdot 1397492 \cdot 141134 \\ 7 \cdot 085457 \cdot 9901869 \\ 5823 \cdot 1457953 \cdot 1457953 \\ \cdot 1457953 \cdot 147369 \\ \left[6 \cdot 785644 \cdot 9833148 \\ \left] 3743 \cdot 1515484 \cdot 153319 \\ \left[6 \cdot 522339 \cdot 9884498 \\ 17 \cdot 151548 \\ \cdot 115548 \\ \cdot 151548 $ | $3 \cdot 1400372 \cdot 141430 \cdot 700593 \cdot 9901462 \cdot 5724 \cdot 1460830 \cdot 147667 \cdot 6 \cdot 791986 \cdot 9892723 \cdot 3644 \cdot 1518359 \cdot 153617 \cdot 6 \cdot 509698 \cdot 9884057 \cdot 1667 \cdot $ | $4 \cdot 1403252 \cdot 141727 \cdot 7 \cdot 055790 \cdot 9901055 \cdot 5625 \cdot 1463708 \cdot 147964 \cdot 6 \cdot 758382 \cdot 9892298 \cdot 3545 \cdot 1521234 \cdot 153914 \cdot 6 \cdot 497104 \cdot 9883615 \cdot 1521234 \cdot 12312 \cdot 12$ | $ \cdot 1406132 \cdot 142024 \cdot 7.041048 \cdot 9900646 \cdot 5526 \cdot 1466585 \cdot 148261 \cdot 6 \cdot 744331 \cdot 9891872 \cdot 3446 \cdot 1524109 \cdot 154212 \cdot 6 \cdot 484558 \cdot 9883172 \cdot 14806122 \cdot $ | $6 \cdot 1409012 \cdot 142331 \cdot 026366 \cdot 9900237 \\ 5427 \cdot 1469463 \cdot 148559 \cdot 6 \cdot 731334 \cdot 9891445 \\ 3347 \cdot 152698 \cdot 154510 \cdot 6 \cdot 472059 \cdot 9882728 \\ 1386 \cdot 6 \cdot$ | $(-1411892) \cdot 142617 \\ (7) \cdot 011744 \\ -9899826 \\ [5328] \cdot 1472340 \\ (-148856 \\ [6] \cdot 17889 \\ (-9882284 \\ (-148856 \\ [6] \cdot 177889 \\ (-988284 \\ (-14885 \\ (-1$ | $8 \cdot 141477 \cdot 142914 \left[6 \cdot 997180 \cdot 9899415 \left[5 \cdot 229 \cdot 1475217 \cdot 149153 \left[6 \cdot 704496 \cdot 9890588 \right] \\ 31149 \cdot 1522733 \cdot 155106 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 31147 \cdot 1423 \cdot 152106 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 3114 \cdot 125 \cdot 12510 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 3114 \cdot 125 \cdot 12510 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 3114 \cdot 125 \cdot 12510 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 3114 \cdot 125 \cdot 12510 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 3114 \cdot 125 \cdot 12510 \left[6 \cdot 447201 \cdot 9881838 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 988188 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 988188 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 988188 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 988188 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 98818 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 988188 \right] \\ 3114 \cdot 12510 \left[6 \cdot 447201 \cdot 988188 \right] \\ 3114 \cdot 12510 \left[6 \cdot 4478188 \right] \\ 3114 \cdot 12$ | $9 \cdot 141761 \cdot 143211 \cdot 6 \cdot 982678 \cdot 9899003 \cdot 51 \cdot 30 \cdot 1478094 \cdot 149451 \cdot 6 \cdot 6 \cdot 9830156 \cdot 9830159 \cdot 155607 \cdot 155404 \cdot 6 \cdot 434842 \cdot 9881392 \cdot 155404 \cdot 6 \cdot 434842 \cdot 9881392 \cdot 155404 \cdot 6 \cdot 434842 \cdot 9881392 \cdot 155404 \cdot 1$ | $0 \cdot 1420531 \cdot 143508 \cdot 6 \cdot 668233 \cdot 9898590 \cdot 50 \cdot 31 \cdot 1480971 \cdot 149748 \cdot 6 \cdot 677867 \cdot 9889728 \cdot 29 \cdot 51 \cdot 1538482 \cdot 155701 \cdot 6 \cdot 422530 \cdot 9880945 \cdot 51 \cdot 155701 \cdot 1557001 \cdot 1557001 \cdot 1557001 \cdot 1557001 \cdot 1570$ | $11 \cdot 1423410 \cdot 143805 \cdot 953847 \cdot 9398177 \\ 4932 \cdot 1483848 \cdot 150045 \cdot 664630 \cdot 9889297 \\ 2852 \cdot 1541356 \cdot 155999 \cdot 6\cdot 410263 \cdot 9880497 \cdot 90000 \\ 3859297 \cdot 2852 \cdot 1541356 \cdot 155999 \cdot 15610263 \cdot 9880497 \cdot 90000 \\ 3859297 \cdot 2852 \cdot 1541356 \cdot 155999 \cdot 15610263 \cdot 90000 \\ 3859297 \cdot 2852 \cdot 1541356 \cdot 15610263 \cdot 90000 \\ 3859297 \cdot 2852 \cdot 1561026 \cdot 1561026 \\ 3859297 \cdot 2852 \cdot 1561026 \\ 3859297 \cdot 2852 \cdot 1561026 \\ 3859297 \cdot 1561026 + 1561026 \\ 3859297 \cdot 1561026 + 1561026 \\ 3859297 \cdot 1561026 \\ 38597 \cdot 1560026 \\ 38$ | $12^{-1}4262896 \cdot 144102 \cdot 6.939519 \cdot 9897762 \cdot 4833 \cdot 1486724 \cdot 150343 \cdot 6.651444 \cdot 9888865 \cdot 2753 \cdot 1544230 \cdot 156297 \cdot 6.398042 \cdot 9880048 \cdot 988065 \cdot 2753 \cdot 1544230 \cdot 156297 \cdot 6.398042 \cdot 9880048 \cdot 98800048 \cdot 9880048 \cdot 988000000000000000000000000000000000$ | $ [3] \cdot [1220168] \cdot [143399] 6 \cdot 925248 \cdot 9897347 [47]34 \cdot [1489601] \cdot [50640] 6 \cdot 638310 \cdot 9888432 \\ [26] \cdot [54] \cdot [547104] \cdot [56595] 6 \cdot 385866 \cdot 9879599 \cdot 9888432 \\ [26] \cdot [$ | $14 \cdot 1432047 \cdot 144696 \left[6 \cdot 911035 \cdot 9896931 \right] 46 \left[35 \cdot 1492477 \cdot 150938 \left[6 \cdot 625225 \cdot 9887998 \right] 25 \left[55 \cdot 1549978 \cdot 156893 \left[6 \cdot 373735 \cdot 9879148 \right] 25 \left[55 \cdot 154978 \cdot 156893 \right] 25 \left[55 \cdot 156893 \right] 25 \left[5$ | $[5\cdot1434926\cdot144493]6\cdot896879\cdot9896514\\ 4536\\ \cdot1495353\\ \cdot151235\\ 6\cdot612191\\ \cdot9887564\\ 2456\\ \cdot1552851\\ \cdot157291\\ \cdot157191\\ \cdot6361650\\ \cdot9878697\\ \cdot9887664\\ \cdot2456\\ \cdot1552851\\ \cdot157291\\ \cdot157191\\ \cdot6361650\\ \cdot6361650\\ \cdot636165\\ \cdot636165\\$ | $16^{-1437805} \cdot 145290 \left[6\cdot 882780^{-9} \cdot 9896096 \left[4437 \cdot 1498230 \right] \cdot 151533 \left[6\cdot 599208 \right] \cdot 9887128 \left[2357 \right] \cdot 1555725 \left[-157490 \left[6\cdot 349609 \right] \cdot 9887825 \right] \cdot 9887128 \left[2357 \right] \cdot 1555725 \left[-157490 \left[6\cdot 349609 \right] \cdot 9887825 \right] \cdot 9887128 \left[-156725 \right] \cdot 155725 \left[-157490 \left[6\cdot 349609 \right] \cdot 9887825 \right] \cdot 9887128 \left[-156725 \right] \cdot 155725 \left[-156725 \right] \cdot 156725 \left[-156725 \right] \cdot 1567$ | $17 \cdot 1440684 \cdot 145587 \cdot 6 \cdot 868737 \cdot 9895677 \cdot 42338 \cdot 1501106 \cdot 151830 \cdot 6 \cdot 586273 \cdot 9886692 \cdot 2258 \cdot 1558598 \cdot 157788 \cdot 6 \cdot 337612 \cdot 9877792 \cdot 157788 \cdot$ | $[8^{+1443562}] \cdot [45846 \cdot 55775] \cdot 9895258 \cdot 4239] \cdot [503981] \cdot [52128 \cdot 573389 \cdot 9886255 \cdot 2159 \cdot 1561472 \cdot 158086 \cdot 525660 \cdot 9877338] \cdot 5886555 \cdot 158086 \cdot 5866 \cdot 5866$ | $19^{-1446440} \cdot 146181 \left[6\cdot 840819 \cdot 9894338 41 \\ 40^{-1} 506857 \cdot 152426 \left[6\cdot 560553 \cdot 9885817 \\ 20 \\ 60^{-1} 564245 \right] \cdot 1564345 \cdot 158384 \\ 6\cdot 313751 \cdot 9876883 \\ 30^{-1} 56625 \cdot 3985817 \\ 30^{-1} 56625 \cdot 3985817 \\ 30^{-1} 56625 \cdot 3985817 \\ 30^{-1} 56625 \cdot 398581 \\ 30^{-1} 56625 \cdot 398582 \\ $ | and a | / Cosine. 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 | 9886692 | 9886255 | 9885817
 | | Sine. | Deg. 81. |
| Cotang. | 0010100 | 221010 | 0022661.0 | 3.785644 | 986164.9 | 3.758382
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| Tang. | 146775 | CHONET - | 147072 | •147369 | •147667 | 147964
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| Cotang. | 7.115960 | concert. | 2.82001-1 | 7.085457 | 1662070-7 | 7-055790
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1000	Cotang.	3-313751	5.301886	6-290065	6-278286	6-266551	3-251858	6-243208	3-231600	3.220034	5-208510	3-197027	3.185586	3.174186	3-162827	5-151508	5-1 10230	5.128992	9-117794	3-106636	3-095517	5-084438	Tang.	
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)eg.	Sine.	1561345	1567218	1270091	1572963	1575836	1578708	1581581	1584453	1587325	1590197	1593069	1595940	1598812	1601683	1604555	1607426	1610297	1613167	1616038	1618909	1621779	Cosine.	
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(e) Tang. Cotang. Cosine. ' Sine. Tang. Cotang. Cosine. 2345 -158384 6-313751 9876433 560305 9357524 9867733 560305 9357524 2218 -158384 6-3137751 9866703 9341 -1682050 -9357524 98665733 560505 9557524 2218 -158380 6-3976428 5922 -1627520 -164951 6-05334 -9366503 3342 -171332 5582051 -9856554 2218 -158380 6-3976428 5923 -1630390 -165556 -6075131 -98657035 -9865743 -9865743 -9865743 -98656544 2031 153279 6-397597 582317 -98655654 -9865773 -9865773 -98657616 -771332 -5829817 -98655654 2031 153277 6-263551 -98750757 -5864703 -171332 -5829817 -98655654 2031 153277 6-263551 -9864770 -111332 -5829817 -986556654 -10090528 -171332<th>9 Deg.9 Deg.9 Deg.10 Deg.7 ang.Cotang.<</th><th>9 Deg.9 Deg.9 Deg.10 Deg.7 ang.Cotang.<</th><th>9 Deg.9 Deg.9 Deg.6.Tang.Cotang.Cotang.Cotang.Cotang.Cotang.Cotang.Cotang.Cotang.Cosine.3345-1588346921-1624650-165345-6073397-9866714339<41-1688246-1706335860505-9857524218-15882566211-165356-165545-6075143-986667038<42-1684941-1709335850251-9856544206115882565211-165356-6075143-986657038<42-16849341-1709335850551-98566554208315595776527826-986667038<42-16849341-1709335850551-9856655420831559776527826-986677038<42-16996382171715325829917-985665520841559776527836-9874136-1637445-966744-986447034<46-1695286-177243057799440-98545772084159376-5254858-9874138-16504745997195-9864420333<4716996382177243057799440-985457420841601746213206-655445-6007957-9864420333<4716996382177243057799440-985457420851601746213209-653445-9864420333<4716996382177243057799440-985457420851601746707445997195-98644213-98638515334716996382177243057799440<</th><th>9 Deg. 9 Deg. 1 Tang. Cotang. Cosine. / / Sine. Tang. Cotang. Cosine. 2145 158396 6313751 987683 6021 1624650 164451 604514 3941 1682026 17083 5660505 59557524 2145 158396 63017 1624550 164451 6051337 9866770 3842 1682701 9856541 2181 158396 6301686 98765379 166451 6051337 9866770 3842 1683761 171232 5630241 9856543 2018 158396 637057 56251 987657 1683763 168577 9864770 3446 19865043 5855643 2038 159376 159376 1663489 1061445 607531 98555661 19857657 198656443 198656443 198656443 198656443 19856544 198656443 19856544 198656443 171332 58203241 98555566 19857657 198565443 198657733 1587761 171232 5820341 9855566477 19864577</th><th>9 Deg.9 Deg.9 Deg.1 Tang. Cotang. Cosine./////345 -1583946-313751687753///32451583806-303713<7431616876-073331667657986572316665723566554198657635665644986576356656449865763568656449865776356865644565664756865644568656445686564456865644568656644756865763568656544<!--</th--><th>9 Deg.9 Deg.6.Tang.Cotang.<</th><th>9 Deg.9 Deg.6.Tang.Cotang.Cotang.Sine.Tang.Cotang.C</th><th>9 Deg.9 Deg.9 Deg.1 Tang. Cotang. Cosine./Sine.Tang. Cotang.Cosine.1 Tang. Cotang. Cosine./Sine.Tang. 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NATURAL SINES AND TANGENTS TO A RADIUS 1.

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Tang.	176327 176626 177236 177527 177527 177527 177527 177527 177827 177827 177827 177827 177827 17796 1779528 17795558 17795558 17795575755757575757575757575757575	Cotang.
Sine.	1.736482 1.736482 1.745073 1.745075 1.745073 1.750903 1.750903 1.750903 1.750903 1.755367 1.755356 1.755356 1.755355 1.755355 1.755373 1.776573 1.777673 1.777673 1.777773 1.777773 1.777773 1.7777773 1.7777773 1.7777773 1.7777777777	Cosine.
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Cotang. Cosine.	1908090 194380 5-144554 9816272 6021 1968018 200727 4-981881 9804433 35 11 2025024 206786 4-835901 9792818 19	1910945 194682 5-186776 9915716 99127 1970470 -30109 4-944351 9903690 3642 -30278 1.527090 4-528811 -9792281 12 	2.19139011149484501252295121010382911076572150162245905901592002010149220014152120769314521702059117 2.101265611655254512101655245451201555245150165524545055017555612020550374555615277525556155775055645745701677 2.1012655	191000011120200101122080-001140455655-1970425-22013884-552012-959212815045-201586418-2080004-807685-979455112	$5 \cdot 1922365 \cdot 195890 \cdot 5 \cdot 104902 \cdot 9813486 \cdot 5526 \cdot 1982276 \cdot 202240 \cdot 4 \cdot 944599 \cdot 9801560 \cdot 34 \cdot 46 \cdot 6 \cdot 2033265 \cdot 208303 \cdot 4 \cdot 800680 \cdot 9789862 \cdot 14 \cdot 922365 \cdot 14 \cdot 922365 \cdot 14 \cdot 922365 \cdot 14 \cdot 922365 \cdot 14 \cdot 923365 \cdot 14 \cdot 92365 \cdot 14 \cdot 923365 \cdot 14 \cdot$	$6 \left[\cdot 1925220 \left[\cdot 196192 \right] 5 \cdot 097042 \left[\cdot 9812927 \right] 5 \frac{1}{2} \left[27 \left[\cdot 1985127 \right] \cdot 202543 \left] 4 \cdot 937206 \left[\cdot 9800988 \right] 3 \right] \frac{1}{2} \left[\cdot 7 \left[\cdot 2042113 \right] \cdot 208607 \left[4 \cdot 793695 \right] \cdot 9789268 \left] 13 \left[\cdot 208607 \right] \frac{1}{2} \left[\cdot 208607 \right] \frac{1}{2$	$\circ 1928074 \cdot 196494 \cdot 5089206 \cdot 9812366 \cdot 5328 \cdot 1987978 \cdot 202846 \cdot 4 \cdot 929835 \cdot 9800405 \cdot 32 \cdot 48 \cdot 2044961 \cdot 208910 \cdot 4 \cdot 786730 \cdot 9788674 \cdot 1280 \cdot 9208405 \cdot 20244961 \cdot 208910 \cdot 4 \cdot 786730 \cdot 9788674 \cdot 1280 \cdot 98674 \cdot 1280 \cdot 1280$	$\cdot 1930928 \cdot 196796 \cdot 5081392 \cdot 9811805 \cdot 5229 \cdot 1990829 \cdot 203149 \cdot 4 \cdot 9222485 \cdot 9799827 \cdot 31149 \cdot 2047808 \cdot 209214 \cdot 4 \cdot 779783 \cdot 9788079 \cdot 11123 \cdot$	$9 \cdot 1933782 \cdot 197098 \cdot 5073602 \cdot 9811243 \cdot 5130 \cdot 1993679 \cdot 203452 \cdot 4 \cdot 915157 \cdot 9799247 \cdot 3050 \cdot 5050655 \cdot 209518 \cdot 4 \cdot 772856 \cdot 9787438 \cdot 10000 \cdot 100000 \cdot 100000 \cdot 10000000 \cdot 10000000 \cdot 10000000 \cdot 100000 \cdot 1000000 \cdot 100000 \cdot 100000 \cdot$	$0 \cdot 193636 \cdot 197400 \cdot 5 \cdot 65835 \cdot 9810680 \cdot 5031 \cdot 1996530 \cdot 203755 \cdot 4 \cdot 907849 \cdot 9798667 \cdot 2951 \cdot 2053502 \cdot 209821 \cdot 4 \cdot 765949 \cdot 9786886 \cdot 2953567 \cdot 295367 \cdot 295367 \cdot 2955767 \cdot 295367 \cdot 2955767 \cdot 295367 \cdot 2955767 \cdot 295757 \cdot 295757 \cdot 2957577 \cdot 295777 \cdot 2957777 \cdot 295777 \cdot 295777 \cdot 295777 \cdot 295777 \cdot 2957777 \cdot 2957777 \cdot 295777 \cdot 2957777 \cdot 295777 \cdot 2957777 \cdot 29577777 \cdot 29577777 \cdot 29577777 \cdot 29577777 \cdot 2957777 \cdot 2957777 \cdot 29577777 \cdot 2957777 \cdot 29577777 \cdot 295777777 \cdot 295777777 \cdot 29577777 \cdot 295777777 \cdot 295777777 \cdot 2957777777 \cdot 2957777777 \cdot 295777777777777777777777777777777777777$	$1 \cdot 1939490 \cdot 197703 \cdot 5 \cdot 658090 \cdot 9810116 \cdot 4932 \cdot 1999380 \cdot 204058 \cdot 4 \cdot 900562 \cdot 9798086 \cdot 2852 \cdot 2056349 \cdot 210125 \cdot 4 \cdot 759060 \cdot 9 \cdot 86288 \cdot 20256349 \cdot 210125 \cdot 202563 \cdot 2$	$2 \cdot 1942344 \cdot 198005 5 \cdot 050369 \cdot 9809552 \cdot 4833 \cdot 2002230 \cdot 204361 \cdot 4 \cdot 893295 \cdot 9797504 \cdot 2753 \cdot 2059195 \cdot 210429 \cdot 4 \cdot 752190 \cdot 9785689 \cdot 210429 \cdot 4 \cdot 752190 \cdot 9785689 \cdot 210429 \cdot 4 \cdot 752190 \cdot 9785689 \cdot 9785689 \cdot 978568 \cdot 210429 \cdot 4 \cdot 752190 \cdot 978568 \cdot 210429 \cdot 210429 \cdot 210429 \cdot 4 \cdot 752190 \cdot 978568 \cdot 210429 \cdot 21042$	06028260	.9784490	.9783889	.9783287	·9782084	$ 8^{-1959461} \cdot 199819^{-004511} \cdot 9806147^{+2}_{-39} \cdot 2019327^{+} \cdot 206180^{+4} \cdot 850128^{+9} \cdot 9793994^{+} 21^{+5}_{-1}^{-1} \cdot 212257^{+} \cdot 711368^{+9} \cdot 9782080^{+1}_{-1} \cdot 12257^{+1}_{-1} \cdot 12257^{+1}_{-$	$0^{-1962314} \cdot 200122^{-4} \cdot 96945^{-9805576} \cdot 41 40 \cdot 2022176 \cdot 206483 \cdot 4 \cdot 843004 \cdot 9793406 \cdot 20 60 \cdot 2079117 \cdot 212556 \cdot 4 \cdot 704630 \cdot 9781476 \cdot 206483 \cdot 2064$		Sine.	Deg. 78.
Cotang.	4.835901	1100201	00211204	4-807685	4-800680	4.793695	4.786730	4.779783	4.772856	4.765949	4.759060	4.752190	4-745340	4.738508	4-731695	4.724901	4-718125	4.711368	4.704630		Tang.	
Tang.	-206786	060102.	969406	-208000	$\cdot 208303$	·208607	·208910	·209214	$\cdot 209518$	$\cdot 209821$	·210125	210429	.210733	•211036	·211340	-211644	$\cdot 211948$	-212252	-212556		Cotang.	
Sine.	2025024	61.91202.	12/0602.	2036418	2039265	·2042113	2044961	2047808	·2050655	2053502	·2056349	·2059195	-2062042	·2064888	·2067734	-2070580	·2073426	-2076272	2079117		/ / Cosine. Cotang.	
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Cosine.	9804433	1986086.	0809212	-9802130	· 9801560	3800985	-9800405	-9799827	·9799247	-9798667	9808646	·9797504	.9796921	·9796337	9795752	·9795167	·9794581	·9793994	·9793406		Sine.	Deg. 78.
Tang. Cotang. Cosine.	4-981881	4-974381	006006.7	4-952012	4.944599	4-937206	4-929835	4.922485	4.915157	4.907849	4-900562	4.893295	$3^{(1)}_{10}45197^{(1)}_{10}307^{(5)}_{10}5042670^{(3)}_{10}980886^{(4)}_{11}2065080^{(3)}_{10}204664^{(4)}_{14}886049^{(3)}_{10}5796921^{(2)}_{12}26524^{(2)}_{12}206204^{(2)}_{12}210733^{(4)}_{12}742^{(4)}_{12}210733^{(4)}_{12}740^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}78509090^{(4)}_{12}785090900^{(4)}_{12}785090900^{(4)}_{12}785090900000^{(4)}_{12}7850900000000000000000000000000000000000$	$(4 \cdot 1948050 \cdot 198610 \cdot 5 \cdot 034993 \cdot 9808420 \cdot 46 \cdot 35 \cdot 2007930 \cdot 204967 \cdot 4 \cdot 878824 \cdot 9796337 \cdot 25 \cdot 55 \cdot 2064888 \cdot 211036 \cdot 4 \cdot 738508 \cdot 9784490 \cdot 21036 \cdot 21036$	$ 5 \cdot 1950903 \cdot 198912 \cdot 5 \cdot 027339 \cdot 9807853 \cdot 45 \cdot 380 \cdot 0010779 \cdot 205270 \cdot 4 \cdot 871620 \cdot 9795752 \cdot 24 \cdot 56 \cdot 2067734 \cdot 211340 \cdot 4 \cdot 73 \cdot 1695 \cdot 9783889 \cdot 9783889 \cdot 10840 \cdot$	$(6^{-1953756} \cdot 199214^{-5} \cdot 019707^{-9} \cdot 9807285^{-1} \cdot 4137^{-2} \cdot 2013629^{-1} \cdot 205573^{-1} \cdot 4435^{-9} \cdot 9795167^{-2} \cdot 237058^{-1} \cdot 211644^{-1} \cdot 4^{-7} \cdot 74901^{-1} \cdot 9783287^{-1} \cdot 211644^{-1} \cdot 12464^{-1} \cdot 1246^{-1} \cdot 1$	$7\cdot1956609\cdot1995175\cdot012098\cdot98067164338\cdot2016478\cdot2058764\cdot857271\cdot9794581\cdot2258\cdot2073426\cdot211948\cdot4\cdot718125\cdot9782684\cdot21094651\cdot21256\cdot9782684\cdot21256\cdot9782684\cdot21256\cdot9782684\cdot2125\cdot9782684\cdot2125\cdot9782684\cdot2125\cdot9782684\cdot2125\cdot9782684\cdot2125\cdot9782684\cdot2125\cdot97826\cdot2125\cdot97826\cdot2125\cdot97826\cdot2125\cdot212\cdot212\cdot212\cdot212\cdot212\cdot212\cdot212\cdot212\cdot21$	4.850128	4.843004		Tang.	
Tang.	-200727	020102-	1-201635	201938	.202240	·202543	·202846	203149	.203452	-203755	·204058	-204361	-204664	·204967	·205270	-205573	·205876	-206180	$\cdot 206483$		Cotang.	
Sine.	1968018	01.801.61.	221216161.	1979425	1982276	·1985127	·1987978	-1990829	·1993679	.1996530	0866661.	2002230	2005080	2007930	-2010779	2013629	2016478	2019327	2022176		/ / Cosine. Cotang.	
	21	2 2	52	25 #	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		~	
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Cosine.	-9816272	0110181910	0910186.	-9814045	9813486	·9812927	·9812366	·9811805	-9811243	·9810680	·9810116	-9809552	9808986	·9808420	9807853	·9807285	·9806716	1-9806147	·9805576	·9805005	Sine.	Deg. 78.
Cotang.	5.144554	5-136576	5.190609	5-112785	$5 \cdot 104902$	5.097042	5.089206	5.081392	5.073602	5-065835	5.058090	5-050369	5.042670	5.034993	5.027339	5-019707	5.012098	5.004511	4.996945	$20 \cdot 1965166 \cdot 200424 \cdot 4.989402 \cdot 9805005 \cdot 40$	Tang.	
Tang.	.194380	194682	106906	002061.	.195890	.196192	·196494	.196796	·197098	.197400	.197703	.198005	198307	.198610	.198912	·199214	.199517	1.199819	.200122	.200424	Cotang.	
Sine.	1908090	1910945	1913801	0196161	1922365	1925220	·1928074	·1930928	.1933782	.1936636	.1939490	·1942344	1945197	·1948050	·1950903	.1953756	.1956609	.1959461	·1962314	.1965166	, Cosine. Cotang.	
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12 Deg.

NATURAL SINES AND TANGENTS TO A RADIUS 1. 12 Deg.

12 Deg.

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and the second second second	Cosine.	0.2079117 212556 4:704630 9781476 6021 2138829 218949 4:567261 9768593 39 41 2195624 225054 4:443876 9755985 19	2 2084507 213164 4-691208 9780265 5523 214512 215294 54577 97677 9767247 3743 2201300 225665 4431339 9764706 1	$-2087652 \cdot 213468 + 684524 \cdot 9779658 \\ 5724 \cdot 2147353 \cdot 219864 + 54826 \\ 0 \cdot 9766723 \\ 8644 + 2204137 \\ 2204137 \\ 225971 \\ 4 \cdot 425343 \\ 0 \cdot 9764057 \\ 16 \cdot 1025 \\ 16 \cdot 1025 \\ 16 \cdot 1025 \\ 16 \cdot 1025 \\ 1025 $	$4 \cdot 2090497 \cdot 213773 4 \cdot 677859 \cdot 9779050 \\ 56 \cdot 225150 194 \cdot 220169 \cdot 4 \cdot 541960 \cdot 9766098 \\ 35 \cdot 45 - 2206974 \cdot 226276 \\ 4 \cdot 419364 \cdot 9763423 \\ 15 \cdot 2206974 \cdot 226276 \\ 4 \cdot 419364 \cdot 9763423 \\ 15 \cdot 2206974 \cdot 226276 \\ 3 \cdot 2206974 \cdot 226276 \\ 4 \cdot 226276 \\ 5 \cdot 22676 \\ 5$	$6 \cdot 2093341 \cdot 214077 \left[4 \cdot 67 \cdot 1212 \right] \cdot 9778441 \left[55 \bigg] 2 \left[53 \bigg] \cdot 220474 \left[4 \cdot 535677 \right] \cdot 9765472 \right] \cdot 34 \bigg] \left[6 \cdot 2209811 \right] \cdot 226582 \left[4 \cdot 413399 \right] \cdot 9765781 \right] \cdot 226582 \left[4 \cdot 413399 \right] \cdot 9765781 \left[5 \cdot 226582 \right] \cdot 226582 \left[4 \cdot 413399 \right] \cdot 9765781 \right] \cdot 226582 \left[4 \cdot 67 \cdot 226582 \right] \cdot 226582 \left[4 \cdot 226582 \right] \cdot 226582 \left[4 \cdot 67 \cdot 226582 \right] \cdot 226582 \left[4 \cdot 67 \cdot 226582 \right] \cdot 226582 \left[4 \cdot 226582 \right] \cdot $	$\circ 2096186 \circ 214381 \left[4 \cdot 664583 \circ 9777832 \left[5427 \right] \circ 2155876 \circ 220779 \right] \left[4 \cdot 529410 \right] \circ 9764845 \left[33 \right] 47 \cdot 2212648 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 9762138 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 97620 \circ 97620 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 97620 \circ 97620 \right] 13 \circ 226888 \left[4 \cdot 407450 \circ 97620 \circ 97620 \right] 13 \circ 226888 \left[4 \cdot 40760 \circ 97620 \circ 97620 \right] 13 \circ 226888 \left[4 \cdot 40760 \circ 97620 \circ 97620 \right] 13 \circ 22688 \left[4 \cdot 40760 \circ 97620 \circ 97620 \circ 97620 \right] 13 \circ 22688 \left[4 \cdot 40760 \circ 97620 \circ 97620 \circ 97620 \circ 97620 \right] 13 \circ 226888 \left[4 \cdot 40760 \circ 97620 \circ 976200 \circ 976200 \circ 976200 \circ 976200 \circ 976200000 \circ 9762000000 \circ 9762000000000000000000000000000000000000$	$2099030 \cdot 214685 \left[4 \cdot 657972 \cdot 9777222 \right] 5328 \cdot 21587 16 \cdot 221084 \right] 4 \cdot 523160 \cdot 9764217 \right] 3248 \cdot 2215485 \cdot 227194 \right] 4 \cdot 401516 \cdot 9751494 \right] 12 \cdot 221545 \cdot 22155 \cdot 22155 \cdot 221555 \cdot 2215555 \cdot 221555 \cdot 221555 \cdot 2215555 \cdot 2215555 \cdot 2$	$8 \cdot 2101874 \cdot 214990 \cdot 4\cdot 651378 \cdot 9776611 \cdot 52 29 \cdot 2161556 \cdot 221389 \cdot 4\cdot 516926 \cdot 9763589 \cdot 31 \cdot 49 \cdot 2218321 \cdot 227500 \cdot 4\cdot 395597 \cdot 9750849 \cdot 395692 \cdot $	$9 \cdot 2104718 \cdot 215294 \\ 4 \cdot 644803 \cdot 9775999 51 \\ 30 \cdot 21639 \cdot 221694 \\ 4 \cdot 510708 \\ 9 \cdot 976296 \\ 30 \\ 50 \cdot 2221158 \cdot 227806 \\ 4 \cdot 399694 \\ 9 \cdot 92221 \\ 50 \cdot 2221158 \cdot 227806 \\ 4 \cdot 399694 \\ 9 \cdot 92221 \\ 10 \cdot 2221 \\ 10 \cdot 222$.9749556	.9748909	.9748261	.9747612	-9746962	9746311	-9745660	·9745008	.9744355	.9743701	1	⁴ Sine.	Deg. 77.
	Cotang.	4-443376	4-431339	4.425343	4.419364	4.413399	4.407450	4.401516	4-395597	4.389694	$0[\circ2107661] \circ 215598] \bullet 638245[\circ9775386] 50[31] \circ 2167236[\circ221999] 4 \circ 504507[\circ9763230] 29[51] \circ 2223994[\circ228112] 4 \circ 383805[\circ9749556] \circ 3749556[\circ9749556] \circ 3749556[\circ9749566] \circ 3749556[\circ9749566] \circ 3749556[\circ9749566] \circ 374956[\circ9749566] \circ 3749556[\circ9749566] \circ 3749556[\circ9749566] \circ 3749556[\circ9749566] \circ 3749566[\circ9749566] \circ 374956[\circ9749566] \circ 3749566[\circ9749566] \circ 3749566[\circ9749566] \circ 3749566[\circ9749566] \circ 374956[\circ9749566] \circ 3749566[\circ9749566] \circ 3749566[\circ9749566] \circ 3749566[\circ9749666] \circ 3749566[\circ9749666] \circ 3749566[\circ9749666] \circ 3749566[\circ97496666] \circ 3749566[\circ97496666] \circ 3749566[\circ974966666] \circ 3749566[\circ9749666666] \circ 3749566[\circ97496666666] \circ 37495666[\circ974966666666666666666666666666666666666$	$[\cdot 2110405 \cdot 215903 4 \cdot 631705 \cdot 977173 49 32 \cdot 2170076 \cdot 222305 4 \cdot 498322 \cdot 9761699 28 52 \cdot 222630 \cdot 228418 4 \cdot 377931 \cdot 9748909 \cdot 97489000 \cdot 97489000 \cdot 97489000 \cdot 97489000 \cdot 97489000 \cdot 97489000 \cdot 97480000 \cdot 974800000 \cdot 974800000 \cdot 974800000 \cdot 9748000000 \cdot 9748000000 \cdot 974800000000000000 \cdot 9748000000000000000000000000000000000000$	$\textbf{2}^{\circ}\textbf{2113248}^{\circ}\textbf{216207} \textbf{4}^{\circ}\textbf{625183}^{\circ}\textbf{9}774159 \textbf{48} \textbf{33}^{\circ}\textbf{-}\textbf{2172915}^{\circ}\textbf{-}\textbf{222610} \textbf{4}^{\circ}\textbf{4}\textbf{9}\textbf{2153}^{\circ}\textbf{9}761067 \textbf{27} \textbf{53}^{\circ}\textbf{-}\textbf{2229666}^{\circ}\textbf{228724} \textbf{4}^{\circ}\textbf{3}72073 \textbf{-}\textbf{9}74826 \textbf{-}\textbf{227} \textbf{53}^{\circ}\textbf{-}\textbf{227} \textbf{53}^{\circ}\textbf{-}\textbf{227} \textbf{53}^{\circ}\textbf{-}\textbf{227} \textbf{-}\textbf{22}^{\circ}\textbf{-}\textbf{227} \textbf{-}\textbf{22}^{\circ}\textbf{-}\textbf{22}$	$\textbf{3} \cdot \textbf{21} \\ \textbf{5091} \cdot \textbf{216512} \\ \textbf{4} \cdot \textbf{618678} \cdot \textbf{9773544} \\ \textbf{47} \\ \textbf{34} \cdot \textbf{2175754} \cdot \textbf{222915} \\ \textbf{4} \cdot \textbf{486000} \cdot \textbf{9760435} \\ \textbf{26} \\ \textbf{526250} \\ \textbf{1} \cdot \textbf{229030} \\ \textbf{4} \cdot \textbf{366229} \\ \textbf{9747612} \\ \textbf{529030} \\ \textbf{4} \cdot \textbf{529030} \\ \textbf{52903} \\ \textbf{529030} \\ 529$	$ 4^{-21} \\ 1834^{-21} \\ 216816 \\ 4^{-61} \\ 2190^{-9} \\ 19772928 \\ 46^{-35} \\ 25^{-21} \\ 255^{-23} \\ 255^{-25}$	5 6 1 2 1 2 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1	$6 \left[\circ 2124619 \cdot 217425 \right] 4 \cdot 599268 \cdot 9771693 \left[44 \right] 57 \cdot 2184271 \right] \cdot 223831 \left[4 \cdot 467637 \cdot 9758533 \right] 23 \left[57 \cdot 9241007 \right] 229949 \left[4 \cdot 345766 \right] + 245660 \left[37 \cdot 326160 \right] + 245660 \left[37 \cdot 32660 \right] + 24560 \left[37 \cdot 3260 \right] + 25660 \left[37 \cdot 32660 \right] + 25660 \left[37 \cdot 3260 \right] + 25660 \left[37 \cdot 3260 \right] + 25660 \left[37 \cdot 32$	$\textbf{7} \bullet \textbf{21} \bullet \textbf{22} \bullet \textbf{22} \bullet \textbf{22} \bullet \textbf{22} \bullet \textbf{22} \bullet \textbf{23} \bullet \textbf{23} \bullet \textbf{21} \bullet \textbf{21} \bullet \textbf{22} \bullet \textbf{22}$	$8^{\circ}2130304^{\circ}218035^{\circ}4^{\circ}586414^{\circ}9770456^{\circ}42^{\circ}39^{\circ}2189948^{\circ}224442^{\circ}4^{\circ}455475^{\circ}9757260^{\circ}21^{\circ}59^{\circ}2246676^{\circ}230561^{\circ}4^{\circ}337231^{\circ}9744355^{\circ}67676^{\circ}676$	$9^{\circ}233146^{\circ}218340^{\circ}4^{\circ}580012^{\circ}9769836^{\circ}4140^{\circ}2192786^{\circ}224748^{\circ}4^{\circ}449418^{\circ}9756623^{\circ}20^{\circ}60^{\circ}2249511^{\circ}23249511^{\circ}9743701^{\circ}1231475^{\circ}9743701^{\circ}1231475^{\circ}123175^{\circ}12315$		Tang.	•
	Tang.	225054	-225665	-225971	-226276	-226582	-226888	-227194	-227500	-227806	-228112	-228418	-228724	-229030	.229336	-229642	229949	-230255	·230561	·230868		Cotang.	
	Sine.	2195624	-2201300	-2204137	·2206974	·2209811	-2212648	2215485	·2218321	.2221158	.2223994	.2226830	-2229666	·2232501	-2235337	-2238172	-2241007	-2243842	·2246676	-2249511		/ / Cosine. Cotang.	×.
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	Cosine.	076859	-976734	-976672	009926-	-976547	·976484	.976421	.976358	-976296	.976233	·976169	·976106	·976043	-975980	016226.	·975853	·975789	975726	-975662		Sine.	Deg. 77.
	Cotang.	4.567261	4-554577	4.548260	4-541960	4-535677	4.529410	4-523160	4-516926	4-510708	4-504507	4.498322	4-492153	4.486000	4.479863	4.473742	4.467637	4-461548	4-455475	4-449418		Tang.	
	Tang.	218949	40%61%.	·219864	.220169	220474	.220779	.221084	.221389	-221694	.221999	.222305	.222610	.222915	-223221	.223526	.223831	.224137	-224442	-224748		Cotang.	
	Sine.	2138829	2144512	-2147353	·2150194	·2153035	·2155876	·2158716	·2161556	2164396	-2167236	-2170076	-2172915	-2175754	-2178593	-2181432	-2184271	.2187110	·2189948	-2192786		Cosine. Cotang.	ALEAN
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	Cotang.	4.704630	4-691208	4.684524	4-677859	4-671212	4-664583	4-657972	4.651378	4-644803	4-638245	4-631705	4-625183	4.618678	4.612190	4-605720	4-599268	4-592832	4.586414	4.580012	4.573628	Tang.	
	Tang.	-212556	1213164	·213468	•213773	·214077	·214381	-214685	.214990	.215294	.215598	-215903	-216207	216512	-216816	.217121	-217425	.217730	-218035	.218340	218644	Cotang.	24
,	Sine.	1116202	7081802	2087652	-2090497	$\cdot 2093341$	-2096186	2099030	-2101874	-2104718	2107561	-2110405	-2113248	-2116091	·2118934	-2121777	·2124619	-2127462	2130304	-2133146	20 ·2135988 ·218644 4·573628 ·9769215 40	Cosine. Cotang.	
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'l'ang. Cotang.	4.208419 4.208419 4.208419 4.197560 4.197560 4.197560 4.197560 4.197560 4.197560 4.18751 4.186751 4.186761 4.1652968 4.1652968 4.1652958 4.1652958 4.12561 4.12561 4.117778	Tang.	
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Tang. Cotang. Cosine.	4.325734 4.325734 4.312906 4.312906 4.312906 4.312958 4.312958 4.312958 4.297248 4.291588 4.291588 4.2553521 4.2553521 4.2553521 4.2553522 4.246848 4.2516848 4.2526848 4.25268977 4.25288977 4.25288977 4.2528848 4.2528848 4.2528848 4.252885977 4.252885977 4.252885977 4.252885977 4.2528859777 4.252859777 4.252859777 4.2528597777 4.2528597777777777777777777777777777777777	Tang.	
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Cotang.	3-816295	3.807260	992862.8	3.793783	3.789310	3.784848	3.780395	3.775951	3.771518	3.767094	3.762680	3.758276	3.753881	3.749496	3.745120	3.740754	3.736398	3.732050	and Sur Const	Tang.	
'l ang.	·262034	262656	106202.	.263589	-263900	.264211	•264522	-264833	-265145	-265456	-265768	.266079	-266390	-266702	-267014	-267325	-267637	.267949	and the	Cotang.	39
Sine.	-2534766 -2537579	-2540393	2546019	·2548832	·2551645	.2554458	-2557270	2560082	·2562894	2565705	·2568517	.2571328	·2574139	-2576950	·2579760	-2582570	-2585381	.2588190		// Cosine. Cotang.	
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Cotang.	3-908901	3.899451	3.894/42	3.885357	3.880680	3.876014	3.871358	3.866713	3.862078	3.857453	3.852839	8.848235	3.843642	3.839059	3.834486	3.829923	3.825370	3.820828		Tang.	200.002
Tang.	·255826	-256446	257066	-257376	-257686	-257097	-258307	-258617	-258928	-259238	-259548	-259859	-260169	-260480	-260791	-261101	.261412	-261723	W. Bar	Cotang.	Chine P
Sine.	·2478445	-2484081	·2489716	.2492533	-2495350	·2498167	-2500984	-2503800	-2506616	-2509432	·2512248	.2515063	-2517879	·2520694	·2523508	.2526323	·2529137	-2531952		/ / Cosine. Cotang.	A
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Cosine.	$0 \underbrace{2419219}{2419219} \cdot \underbrace{249028}{4.010780} \cdot \underbrace{9702957}{9.002815} \\ 0 \underbrace{021}{248415} \cdot \underbrace{255826}{255826} \cdot \underbrace{3908901}{3.908301} \cdot \underbrace{9687998}{3994171} \cdot \underbrace{394166}{262034} \cdot \underbrace{255034}{3.816295} \cdot \underbrace{3516295}{96272458} \cdot \underbrace{36136}{3.9087277} \cdot \underbrace{3941}{3.842} \cdot \underbrace{2557579}_{262245} \cdot \underbrace{384173}_{3.811773} \cdot \underbrace{967277}_{3.862275} \cdot \underbrace{357579}_{262245} \cdot \underbrace{3611773}_{3.9072678} \cdot \underbrace{367579}_{262275} \cdot \underbrace{267579}_{262275} \cdot \underbrace{367579}_{262275} \cdot \underbrace{367579}_{26275} \cdot \underbrace{367575}_{26275} \cdot \underbrace{367575}_{26275} \cdot \underbrace{367575}_{26275} \cdot \underbrace{367575}_{2675} \cdot \underbrace{367575}_{275} \cdot \underbrace$	9701548	9700135	24 33329 25 0873 3-986073 9699428 5526 2492533 257376 3-865357 9684383 3446 2548832 263589 3-793783 9669718	.9698720	1108696.	$\circ 2441792 \cdot 251801 \cdot 3 \cdot 971386 \cdot 9697301 \cdot 5229 \cdot 2500984 \cdot 258307 \cdot 3 \cdot 871358 \cdot 9682204 \cdot 3149 \cdot 2557270 \cdot 264522 \cdot 3 \cdot 780395 \cdot 9667490 \cdot 32641792 \cdot 3267792 \cdot 32677792 \cdot 32677792 \cdot 32677772 \cdot 32677777777777777777777777777777777777$	$\cdot 2444613 \cdot 252110 \cdot 3966513 \cdot 9696591 \cdot 5130 \cdot 2503800 \cdot 258617 \cdot 3866713 \cdot 9681476 \cdot 3060 \cdot 2560082 \cdot 264833 \cdot 3775951 \cdot 9666746 \cdot 3060 \cdot $	$0^{-2447433} \cdot 252420^{-3} \cdot 961651^{-9} \cdot 969579^{-50} \cdot 31^{-2506616} \cdot 258928^{-3} \cdot 862078^{-9} \cdot 9680748^{-29} \cdot 51^{-1} \cdot 2562894^{-2} \cdot 256145^{-3} \cdot 771518^{-9} \cdot 9666001^{-2} \cdot 2562894^{-2} \cdot 256284^{-2} $	$2450254 \cdot 252729 \cdot 3956801 \cdot 9695167 \cdot 4932 \cdot 2509432 \cdot 259238 \cdot 3857453 \cdot 9680018 \cdot 285705 \cdot 2565705 \cdot 265456 \cdot 38767094 \cdot 9665255 \cdot 2565705 \cdot 2567575 \cdot 2565705 \cdot 25675705 \cdot 25675705 \cdot 2567575 \cdot 2565705 \cdot 2567575 \cdot 2567575 \cdot 2565705 \cdot 2567575 \cdot 25675757575 \cdot 256757575 \cdot 25675757575 \cdot 256757575757575 \cdot 25675757575757575 \cdot 2567575757575757575757575757575757575757$	$ \left[2 \cdot 2453074 \cdot 253038 \right] 3 \cdot 951961 \right] \cdot 9694453 \left[48 \right] 3 \cdot 2512248 \left[259548 \right] 3 \cdot 852839 \right] \cdot 9679288 \left[27 \right] 5 \left[2585517 \right] \cdot 265768 \left[3 \cdot 762680 \right] \cdot 9664508 \left[28 \cdot 2565768 \right] \right] \cdot 265768 \left[3 \cdot 76568 \right] \cdot 26568 \left[3 \cdot 7668 \right] \cdot 26568 \left[3 \cdot 7668$	$13^{-}2455894^{-}253348^{-}3\cdot947133^{-}9693740^{+}47^{-}34^{-}2515063^{-}259859^{-}3\cdot848235^{-}967857^{-}2577^{-}2571328^{-}266079^{-}3\cdot758276^{-}9663761^{-}32576^{-}32577^{-}32577^{-}3257^{-}32577^{-}32577^{-}32577^{-}3257^{-}3$	$14^{-}2458713^{-}5256583^{-}942315^{-}9693025^{-}46^{-}85^{-}2517879^{-}260169^{-}3\cdot843642^{-}9677825^{-}2574139^{-}266390^{-}3\cdot75381^{-}9663012^{-}2574139^{-}266390^{-}375381^{-}9663012^{-}266390^{-}375381^{-}9663012^{-}266390^{-}266$	$15 \cdot 2461533 \cdot 253967 \cdot 3 \cdot 937509 \cdot 9692309 \cdot 45 \cdot 36 \cdot 2520694 \cdot 260480 \cdot 3 \cdot 339059 \cdot 9677092 \cdot 245 \cdot 557695 \cdot 266702 \cdot 3 \cdot 749496 \cdot 9662263 \cdot 9662263 \cdot 9662263 \cdot 9662263 \cdot 9662263 \cdot 9662263 \cdot 966263 \cdot 96623 \cdot 966263 \cdot 966263 \cdot 966263 \cdot 966263 \cdot 966263626363 \cdot 96$	$16 \cdot 2464352 \cdot 254277 \cdot 2579760 \cdot 2691593 \cdot 4437 \cdot 2523508 \cdot 260791 \cdot 3 \cdot 834486 \cdot 9676358 \cdot 2579760 \cdot 267014 \cdot 3 \cdot 745120 \cdot 9661513 \cdot 3679760 \cdot 267014 \cdot 3 \cdot 745120 \cdot 9661513 \cdot 3 \cdot 745120 \cdot 96615120 \cdot 9661$	$17^{-}2467171^{-}254587^{-}3 \cdot 927929^{-}9690875^{-}43^{-}88^{-}2526323^{-}261101^{-}3 \cdot 829923^{-}9675624^{-}2258^{-}2282570^{-}267325^{-}3 \cdot 740754^{-}9660762^{-}267225^{-}3 \cdot 740754^{-}9660762^{-}267225^{-}328^{-}26725^{-}328^{-}328^{-}26725^{-}328^{-}328^{-}26725^{-}328^$	$18 \cdot 2469990 \cdot 254896 \cdot 3 \cdot 923156 \cdot 9690157 + 2389 \cdot 2529137 \cdot 261412 \cdot 3 \cdot 825370 \cdot 9574888 \cdot 2159 \cdot 2585381 \cdot 267637 \cdot 3 \cdot 736398 \cdot 9660011 \cdot 266637 \cdot 3 \cdot 736398 \cdot 966637 \cdot 3 \cdot 736398 \cdot 9666737 \cdot 266637 \cdot 3 \cdot 736398 \cdot 9666737 \cdot 266637 \cdot 3 \cdot 736398 \cdot 9666737 \cdot 266637 \cdot 266637 \cdot 266637 \cdot 266637 \cdot 2666737 \cdot 266677 \cdot 266677 \cdot 266777 \cdot 2667777 \cdot 26677777 \cdot 266777777 \cdot 26677777777 \cdot 2667777777 \cdot 2667777777777$	$19 \cdot 2472809 \cdot 255206 \cdot 3 \cdot 918393 \cdot 9689438 \cdot 4140 \cdot 2531952 \cdot 261723 \cdot 3 \cdot 820828 \cdot 9674152 \cdot 2060 \cdot 6288190 \cdot 267949 \cdot 3 \cdot 722050 \cdot 9659258 \cdot 9674152 \cdot 2060 \cdot 2687949 \cdot 3 \cdot 722050 \cdot 9659258 \cdot 9674152 \cdot 2060 \cdot 208794 \cdot 2087966 \cdot 208794 \cdot 208796 \cdot 2087$	20 -2475627 -255516 3-913642 -9688719 40	Sine.	Deg. 75.
Tang. Cotang.	4-005816	4-000863	3-9900992	3-986073	3.981166	3.976271	3.971386	3.966513	3-961651	3.956801	3-951961	3.947133	3.942315	3.937509	3.932714	3-927929	3.923156	3.918393	3.913642	Tang.	
Tang.	-249328 -249637	-249946	-250255	-250873	.251182	.251491	·251801	.252110	.252420	.252729	·253038	·253348	·253658	-253967	.254277	·254587	.254896	-255206	-255516	Cotang.	
Sine.	2419219	-2424863	-2427685	.2433329	·2436150	·2438971	-2441792	·2444613	-2447433	-2450254	·2453074	·2455894	-2458713	2461533	·2464352	-2467171	2469990	-2472809	.2475627	/ Cosine.	
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15 Deg.

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15 Deg.

1-	19	18	17	16	15	14	13	12	11	10	6	80	2	9	2	4	3	2	-	0		-	4
Tang. Cotang. Cosine.	0.2588190.967949 3.732050.9659258 6021 2647147 274507 3.642891 9643268 39411 2703204 280773 3.561590 9627704 19	2591000 288261 3.727713 9658505 [5922] 2649952 274820 3.638744 9642497 3842 2706004 281087 3.557613 9626917 [18	$\textbf{2593810} \cdot \textbf{268572} \\ \textbf{3723384} \cdot \textbf{9657751} \\ \textbf{5823} \cdot \textbf{2652757} \cdot \textbf{275133} \\ \textbf{37634666} \cdot \textbf{9641726} \\ \textbf{37143} \cdot \textbf{2708805} \cdot \textbf{281401} \\ \textbf{3753644} \cdot \textbf{9626130} \\ \textbf{17} \\ \textbf{17} \\ \textbf{18} \\ \textbf{18}$	$\textbf{2596619} \cdot \textbf{268884} \cdot \textbf{3} \cdot \textbf{719065} \cdot \textbf{9656996} \cdot \textbf{57} \textbf{24} \cdot \textbf{2655561} \cdot \textbf{275445} \cdot \textbf{3} \cdot \textbf{30477} \cdot \textbf{9640954} \cdot \textbf{36} \cdot \textbf{449} \cdot \textbf{3711605} \cdot \textbf{281715} \cdot \textbf{3549684} \cdot \textbf{9625342} \cdot \textbf{16} \cdot \textbf{36164} \cdot \textbf{36166} \cdot 36$	$2599428 \cdot 269196 \cdot 3 \cdot 714756 \cdot 9656240 \cdot 5623 \cdot 2658366 \cdot 275758 \cdot 3 \cdot 526356 \cdot 9640181 \cdot 35445 \cdot 2714404 \cdot 282029 \cdot 3 \cdot 545732 \cdot 9624552 \cdot 15623 \cdot 255758 \cdot 15623 \cdot 15623 \cdot 255758 \cdot 15623 \cdot 1$	$2602237 \cdot 269508 \mid 3 \cdot 710456 \cdot 9655484 \mid 5526 \cdot 2661170 \mid 2 \cdot 76071 \mid 3 \cdot 622244 \cdot 9639407 \mid 3446 \cdot 2 \cdot 717204 \mid 2 \cdot 82343 \mid 3 \cdot 541788 \mid 9623762 \mid 14 \cdot 623762 \mid 14 \cdot 6237622 \mid 14 \cdot 6237622222 \mid 14 \cdot 6237622 \mid 14 \cdot 623762222222222222222222222222222222222$	$2605045 \cdot 269820 \cdot 3 \cdot 7061 \cdot 64 \cdot 9654726 \cdot 5427 \cdot 2663973 \cdot 276385 \cdot 3 \cdot 618141 \cdot 9638633 \cdot 3347 \cdot 2720003 \cdot 282657 \cdot 3 \cdot 537852 \cdot 9622972 \cdot 128265 \cdot 12826 \cdot 1282$	$2607853 \cdot 270132 \cdot 3701383 \cdot 9653968 \cdot 5328 \cdot 2666777 \cdot 276698 \cdot 3 \cdot 614046 \cdot 9637858 \cdot 32428 \cdot 2722802 \cdot 282971 \cdot 3 \cdot 533925 \cdot 9622180 \cdot 12 \cdot 23233 \cdot 2323 \cdot 23233 \cdot 23333 \cdot 233333 \cdot 2333333 \cdot 233333 \cdot 2333333 \cdot 2333333 \cdot 2333333 \cdot 233333 \cdot 233333 \cdot 233333 \cdot 233333 \cdot 233333 \cdot 2333333 \cdot 2333333 \cdot 2333333 \cdot 233333 \cdot 2333333 \cdot 2333333 \cdot 2333333 \cdot 2333333 \cdot 2333333 \cdot 23333333 \cdot 2333333 \cdot 2333333 \cdot 23333333 \cdot 2333333 \cdot 23333333 \cdot 233333333$	$-3610662 \cdot 370444 \left[3 \cdot 697610 \cdot 9653209 \right] 52 \left[29 \cdot 2669581 \right] \cdot 277011 \left[3 \cdot 609960 \cdot 9637081 \right] 3149 \right] \cdot 2725601 \cdot 283285 \left[3 \cdot 530005 \right] \cdot 9621387 \left[3 \cdot 60765 \right] \cdot 282285 \left[3 \cdot 53005 \right] \cdot 9621387 \left[3 \cdot 60765 \right] \cdot 962137 \left[3 \cdot 60765 \right] \cdot 96217 \left[3$	•2613469 •270757 3•693346 •9652449 51 30 •2672384 •277324 3•605883 •9636305 30 50 •2728400 •283599 3•526093 •9620594 10	$0^{-2616277} \cdot 271069^{-3.689092} \cdot 9651689^{-5031} \cdot 2675187 \cdot 277637 \cdot 3.601814 \cdot 9635527 \cdot 2951 \cdot 2731198 \cdot 283914 \cdot 3.522190 \cdot 9619800 \cdot 363657 \cdot 3231198 \cdot 3231198 \cdot 3231198 \cdot 3231198 \cdot 323196 \cdot 3231198 \cdot 323196 \cdot 323198 \cdot 323188 \cdot 32318 \cdot 32$	$1.2619085 \cdot 271381 \cdot 3.684847 \cdot 9650927 \cdot 4932 \cdot 2677989 \cdot 277951 \cdot 3.597754 \cdot 9634748 \cdot 2852 \cdot 2733997 \cdot 284228 \cdot 3.518294 \cdot 9619005 \cdot 284228 \cdot 3.518294 \cdot 9619005 \cdot 3.518294 \cdot 961905 \cdot 3.518294 \cdot 961905 \cdot 3.518295 \cdot 3.51829 \cdot 3.$	$ 2^{\circ} 2621892 \cdot 271694 \cdot 2880611 \cdot 9650165 48 \cdot 33 \cdot 2680792 \cdot 278264 \cdot 3593702 \cdot 9633969 \cdot 2753 \cdot 2736794 \cdot 284543 \cdot 3514407 \cdot 9618210 \cdot 96182$	$3^{+}{}_{2}624699 + 272006 + 276574 + 9649402 + 734 + 2883594 + 278578 + 3589659 + 9633189 + 2654 + 2739592 + 284857 + 3510527 + 9617413 + 3510527 + 9617413 + 3510527 + 351077 + 351077 + 351077 + 351077 + 3510777 + 35107777 + 35107777 + 3510777777777777777777777777777777777777$	$4^{\circ} 2627506^{\circ} 272318^{\circ} 3 \cdot 672166^{\circ} 9648638^{\circ} 46^{\circ} 85^{\circ} 288396^{\circ} 278891^{\circ} 3 \cdot 585624^{\circ} 9632408^{\circ} 25^{\circ} 55^{\circ} \cdot 2742390^{\circ} - 285172^{\circ} 3 \cdot 506655^{\circ} \cdot 9616616^{\circ} 6666^{\circ} 6666^{\circ} - 2766656^{\circ} - 276666^{\circ} - 27666^{\circ} - 27666^{\circ} - 27666^{\circ} - 27666^{\circ} - 27666^{\circ} - 276666^{\circ} - 276666^{\circ} - 27666^{\circ} - 276666^{\circ} - 27666^{\circ} - 276666^{\circ} - 276666^{\circ} - 276666^{\circ} - 276666^{\circ} - 276666^{\circ} - 276666^{\circ} - 2766$	$5 \cdot 2630312 \cdot 2772631 \cdot 3 \cdot 677957 \cdot 9647873 \cdot 45 \cdot 36 \cdot 2689198 \cdot 279205 \cdot 3 \cdot 581597 \cdot 9631626 \cdot 24 \cdot 567 \cdot 587456 \cdot 27456 \cdot 285436 \cdot 3 \cdot 585436 \cdot 3 \cdot 58158 \cdot 8 \cdot 585436 \cdot 3 \cdot 58546 \cdot 3 \cdot 58566 \cdot 3 \cdot 58666 \cdot 38666 \cdot 38666 \cdot 38666 \cdot 386666 \cdot 38666 \cdot 386666 \cdot 3866666 \cdot 3866666 \cdot 386666 \cdot 3866666 \cdot 386666 \cdot 3866666 \cdot 386666 \cdot 3866666 \cdot 3866666 \cdot 3866666 \cdot 3866666 \cdot 38666666 \cdot 38666666 \cdot 386666666666$	$6 \cdot 2633118 \cdot 272943 \cdot 3 \cdot 663757 \cdot 9647108 \cdot 4437 \cdot 2692000 \cdot 279518 \cdot 3 \cdot 577579 \cdot 9630843 \cdot 2357 \cdot 2747984 \cdot 285801 \cdot 3 \cdot 498935 \cdot 9615019 \cdot 9630843 \cdot 23577 \cdot 235767 \cdot 235767 \cdot 23577 \cdot 235777 \cdot 235777 \cdot 235777 \cdot 23577 \cdot 235777 \cdot 2357777 \cdot 2357777 \cdot 2357777 \cdot 2357777 \cdot 23577777 \cdot 2357777 \cdot 23577777 \cdot 2357777777 \cdot 235777777777777777777777777777777777777$	$7 \cdot 2635925 \cdot 2^{-3}3256 \cdot 3 \cdot 659566 \cdot 9646341 \cdot 43 \cdot 38 \cdot 2694801 \cdot 279332 \cdot 3 \cdot 573569 \cdot 9630060 \cdot 22 \cdot 58 \cdot 2750781 \cdot 286115 \cdot 3 \cdot 495087 \cdot 9614219 \cdot 3 \cdot 6123 \cdot 3 \cdot 6123 \cdot 3 \cdot 6123 \cdot 61$	$8 \cdot 2638730 \cdot 273569 \cdot 255384 \cdot 964574 \cdot 4239 \cdot 2697602 \cdot 280145 \cdot 3 \cdot 569568 \cdot 9629275 \cdot 2159 \cdot 2753577 \cdot 286430 \cdot 3 \cdot 491247 \cdot 9613418 \cdot 961381 \cdot 961381 \cdot 961381 \cdot 9613818 \cdot 961381818 \cdot 9613818 \cdot 9613818 \cdot 9613818 \cdot 9613818 \cdot 9613818 \cdot 961381$	$19^{-}2641536^{-}273881^{-}3651211^{-}9644306^{-}41^{-}40^{-}2700403^{-}280459^{-}3\cdot565574^{-}9628490^{-}20^{-}60^{-}2756374^{-}3\cdot28745^{-}3\cdot487414^{-}9612617^{-}3\cdot2756374^{-}3}756776^{-}3\cdot2756374^{-}3}7576776^{-}3\cdot2756374^{-}3}7576776^{-}3}757767776^{-}3}7577767777777777777777777777777777777$		Sine.	Deg. 74.
Cotang.	3.561590	3-557613	3-553644	3.549684	3.545732	3.541788	3.537852	3-533925	3-530005	3.526093	3-522190	3.518294	3.514407	3-510527	3-506655	3-502791	3.498935	3-495087	3-491247	3.487414		Tang.	
Tang.	-280773	-281087	-281401	-281715	-282029	·282343	-282657	.282971	-283285	-283599	·283914	-284228	·284543	-284857	-285172	-285486	-285801	-286115	-286430	·286745		Cotang.	
Sine.	-2703204	·2706004	·2708805	-2711605	-2714404	·2717204	-2720003	·2722802	-2725601	·2728400	-2731198	-2733997	·2736794	-2739592	2742390	-2745187	-2747984	18706721	-2753577	2756374		/ / Cosine. Cotang.	
~	41	42	43	44	45	46	17	48	49	50	10	52	53	54	55	56	22	58	59	60		-	
	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20		~	
Cosine.	.9643268	·9642497	.9641726	·9640954	.9640181	·9639407	.9638633	.9637858	·9637081	.9636305	.9635527	.9634748	9633969	·9633189	.9632408	.9631626	.9630843	·9630060	.9629275	·9628490		Sine.	Deg. 74.
Tang. Cotang. Cosine. ' '	3.642891	3.638744	3-634606	3.630477	3.626356	3.622244	3.618141	3.614046	3-609960	3.605883	3.601814	3.597754	3.593702	3-589659	3.585624	3-581597	3-577579	3-573569	3.569568	3-565574		Tang.	
Tang.	-274507	-274820	-275133	·275445	-275758	.276071	-276385	·276698	110772.	-277324	-277637	-277951	-278264	-278578	·278891	-279205	.279518	-279832	-280145	-280459		Cotang.	
Sine.	-2647147	-2649952	-2652757	·2655561	-2658366	·2661170	·2663973	-2666777	-2669581	·2672384	-2675187	·2677989	2680792	·2683594	-2686396	-2689198	-2692000	-2694801	-2697602	-2700403		/ / Cosine. Cotang.	
-	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		-	
-	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	-	
Cosine.	9659258	·9658505	.9657751	·9656996	.9656240	·9655484	.9654726	.9653968	.9653209	.9652449	·9651689	-9650927	·9650165	.9649402	.9648638	.9647873	-9647108	·9646341	·9645574	·9644806	9644037	Sine.	Deg. 74.
Tang. Cotang. Cosine. '	3-732050	3.727713	3.723384	3.719065	3.714756	3.710455	3.706164	3.701883	3-697610	3.693346	3.689092	3.684847	3.680611	3.676384	3.672166	3-667957	3-663757	3.659566	3-655384	3.651211	20 2644342 274194 3.647046 9644037 40	Tang.	
Tang.	267949	-268261	-268572	268884	·269196	-269508	-269820	-270132	-270444	-270757	·271069	.271381	-271694	-272006	-272318	-272631	-272943	.2.3256	-273569	18881.	-274194	Cotang.	
Sine.	2589 90	2591000	2593810	2596619	2599428	2602237	2605045	2607853	-2610662	2613469	-2616277	-2619085	-2621892	-2624699	2627506	2630312	-2633118	2635925	-2638730	-2641536	.2644342	/ Cosine. Cotang.	
-	10	-	62	3	4	20	9	2	00	6	10	11	12	13	14	15	16	17	18	19	20	1.	

16 Deg.

16 Deg.

16 Deg.

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Cosine.	2756374 286745 3487414 -9612617 6021 -2815042 293368 3408688 9595600 39 41 -2870819 299697 3-336699 -9579060 19 2759170 -287060 3483689 -9611815 5922 -2817833 293683 3405021 -9594781 3842 -2873605 -300014 3-333773 -9578225 18	$\circ 761966 \left[\circ 287375 \right] \circ 479772 \left[\circ 9611012 \left[5823 \right] \circ 2820624 \left[\circ 293999 \right] \circ 40136 \left[\circ 959396 \right] \circ 7743 \left[\circ 2876391 \right] \circ 30331 \left[\circ 3\cdot 329654 \left] \circ 9577389 \right] \circ 776196 \left[\circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left] \circ 3\cdot 329654 \left[\circ 3\cdot 3296544 \left[\circ 3\cdot 329454 \left[\circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left[\circ 3\cdot 329654 \left[\circ 3\cdot 329644 \left[\circ 3\cdot 3296444 \left[\circ 3\cdot 329444 \left[\circ 3\cdot 329444 \left[\circ 3\cdot 329444 \left[\circ 3- 3296444 \left[\circ 3\cdot 329444 \left[\circ 3\cdot 3294444 \left[\circ 3\cdot 3294444 \left[\circ 3\cdot 3294444 \left[\circ 3\cdot 329444444444444444444444444444444444444$.9576552 1	2767556 288005 3472161 9609403 5625 2826205 294632 3394063 9592318 3545 2881963 300965 3328366 9575714 15	.9574875 1	2773147.288635]3464531.9607792[5427]2831785.295264]3386793 9590672[3347]2887533]301600[3315645]9574035[13	2775941.2889503.460802.9606984[5328].2834575.295580[3:383169].9589848[32]48].2890318].301917[3:312159].9573195[12	·9572354 1	.9571512	-9570669	.9569825	1868996.	.9568136	.9567290	.9566443	-9565595	·9564747	9563898	.9563048	- ANA	Sine.	Deg. 73.
Cotang.	2756374 286745 3-487414 9612617 6021 2815042 293368 3-408688 9595600 3941 2870819 299697 3-336699 9579060 2759170 287000 3-483589 9611815 5922 2817833 2-293653 3-405021 9594781 3842 2873605 -000014 3:333173 9575225	3.329654	$\circ 2764761 \\ \circ 287690 \\ \circ 3\cdot 475963 \\ \circ 9610208 \\ \circ 5724 \\ \circ 2823415 \\ \circ 292315 \\ \circ 294315 \\ \circ 293140 \\ \circ 3\cdot 397708 \\ \circ 9593140 \\ \circ 36144 \\ \circ 2879177 \\ \circ 300648 \\ \circ 3\cdot 306141 \\ \circ 9576552 \\ \circ 953140 \\ \circ 9576552 \\ \circ 957765 \\ \circ 957765 \\ \circ 95776 \\ \circ$	3-322636	$2770352 \cdot 288320 \left[3\cdot 468367 \cdot 9608598 \right] 55 \left[26828995 \cdot 294948 \right] 3\cdot 390424 \cdot 9591496 \left[34 \frac{1}{46} \cdot 2884748 \cdot 301283 \right] 3\cdot 319137 \cdot 9574875 \left[388776 \cdot 2884748 \cdot 301283 \right] 3\cdot 319137 \cdot 9574875 \left[388776 \cdot 288726 \cdot 288728 \right] 3\cdot 310127 \cdot 9574875 \left[388776 \cdot 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3$	$0^{\circ}2784324^{\circ}289396^{\circ}3\cdot449512^{\circ}9604558^{\circ}50^{\circ}31^{\circ}2842942^{\circ}296529^{\circ}3\cdot372340^{\circ}9587371^{\circ}2951^{\circ}2898671^{\circ}302870^{\circ}3\cdot301743^{\circ}9570669^{\circ}388671^{\circ}302870^{\circ}3\cdot301743^{\circ}3\cdot30173^{\circ}3\cdot301743^{\circ}30173743^{\circ}301743^{$	-2787118 + 290211 + 3 + 45763 + 9603748 + 4932 + 2845731 + 296846 + 3 + 368745 + 9586543 + 28901455 + 303187 + 3 + 286255 + 9569825 + 95698625 + 9569825 + 95698625 + 9569825 + 9569825 + 9569825	$\circ 2789911 \circ 290526 \circ 3 \cdot 442022 \circ 9602937 \circ 148 \circ 33 \circ 284852 \circ 297163 \circ 385156 \circ 9585715 \circ 2753 \circ 2904239 \circ 303505 \circ 3294833 \circ 9568981 \circ 2783 \circ 297163 \circ 2971763 \circ 297163 \circ 2971763 \circ 2971777763 \circ 2971763 \circ 2971763 \circ 2971763 \circ 297$	2792704 290842 3-433289 9602125 47134 2851308 297479 3-361575 9584886 2654 2907022 303823 3-291387 9568136	$ [4 \cdot 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95666666 \cdot 956666666666$	$[6\cdot 2801083\cdot 291789]\cdot 3427153\cdot 9599684\cdot 4437\cdot 2859671\cdot 298429\cdot 3\cdot 350872\cdot 958239\cdot 2357\cdot 2915371\cdot 304776\cdot 3\cdot 281090\cdot 9565595\cdot 381080\cdot 381000\cdot 381000\cdot 381000\cdot 381000\cdot 38100\cdot 381$	$17^{2803875} \cdot 292104 \cdot 3 \cdot 423429 \cdot 9598669 \cdot 4338 \cdot 2862458 \cdot 298746 \cdot 3 \cdot 347319 \cdot 9581562 \cdot 2258 \cdot 2918153 \cdot 305094 \cdot 3 \cdot 277671 \cdot 9564747 \cdot 20564747 \cdot 20567767 \cdot 20564747 \cdot 20564747 \cdot 20567767 \cdot 20567777 \cdot 205677777 \cdot 205677777 \cdot 2056777777 \cdot 2056777777777777777777777777777777777777$	$ [8^{+}2806667] \cdot 292420] 3 \cdot 419731 \cdot 9598053 \cdot 42] 39 \cdot 2865246 \cdot 299063 \cdot 3 \cdot 343772 \cdot 9580729 \cdot 2159 \cdot 2920935 \cdot 305412 \cdot 3 \cdot 274258 \cdot 9563898 \cdot 305612 \cdot 20563898 \cdot 2056388 \cdot 20563898 \cdot 20563898 \cdot 2056388 \cdot 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Tang.	-299697	•300331	.300648	.300965	.301283	-301600	-301917	-302235	.302552	.302870	-303187	.303505	.303823	·304141	-304458	.304776	-305094	.305412	.305730		Cotang.	
Sine.	-2870819	-2876391	7719177	·2881963	·2884748	-2887533	·2890318	·2893103	·2895887	-2898671	-2901455	·2904239	-2907022	-2909805	·2912588	·2915371	-2918153	-2920935	-2923717	1 1 1 1	/ Cosine. Cotang.	
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Cosine	-959560 -959478	959396	·959314	-959231	·959149	-929067	-958984	-958902	918886.	958737	·958654	.958571	.958488	-958405	.958322	.958239	.958156	-958072	957989	1246	Sine.	Del
Cotang. Cosine.	3-408688 3-405021	3-401361	3.397708	3-394063	3.390424	3.336793	3-383169	3-379553	3.375943	3-372340	3.368745	3 365156	3.361575	3.358000	3.354433	3-350872	3-347319	3.343772	3-340232	the state of	Tang.	1.14.11
Tang.	-293368 -293683	·293999	-294316	-294632	·294948	·295264	-295580	-295897	-296213	-296529	-296846	-297163	-297479	·297796	-298112	-298429	-298746	-299063	-299380	442	Cotang.	and and
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Cotang. Cosine.	3-487414 3-483589	3-479772	3-475963	3-472161	3.468367	3-464581	3-460802	3-457031	3-453267	3-449512	3-445763	3-442022	3-438289	3-434563	3-430844	3-427153	3.423429	3-419733	3-416044	3-412362	Tang.	(C)
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Sine.	2756374	-2761965	-2764761	-2767556	-2770352	-2773147	-2775941	-2778736	-2781530	·2784324	-2787118	1166875.	·2792704	795497	2798290	-2801083	2803875	2806667	2809459	20 -2812251 -293052 3-412362 -9596418 40	Cosine. Cotang.	
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Cotang.	3-136563	3.133414	3.130270	3.127131	3.123999	3.120872	3-117750	3-114635	3-111525	3.108421	3-105322	3-102229	3.099141	3-096059	3.092983	3.089912	3.086846	3.083786	3-080732	3-077683		Tang.	
Tang.	-318820	·319140	.319461	·319781	.320102	.320423	.320744	·321064	.321385	.321706	.322027	.322348	.322670	.322991	.323312	.323633	.323955	·324276	.324598	.324919		Cotang.	
Sine.	3037559	.3040331	·3043102	·3045872	$\cdot 3048643$.3051413	.3054183	.3056953	.3059723	·3062492	.3065261	·3068030	·3070798	·3073566	·3076334	-3079102	.3081869	·3084636	.3087403	.3090170		/ / Cosine. Cotang.	
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Cosine.	.9545009	·9544141	·9543273	·9542403	·9541533	·9540662	.9539790	.9538917	·9538044	.9537170	·9536294	.9535418	·9534542	·9533664	9532786	·9531907	·9531027	·9530146	.9529264	.9528382		Sine.	Deg. 72.
Tang. Cotang.	3-200789	3.197521	3.194259	3-191003	3-187754	3.184510	3.181272	3.178040	3.174814	3.171594	3.168380	3-165172	3.161970	3.158774	3-155584	3.152399	3-149220	3.146047	3.142880	3.139719		Tang.	0.0
Tang.	312422	.312742	·313061	·313381	·313700	·314020	·314339	·31 4659	.314979	.315298	.315618	315938	.316258	.316578	.316898	.317218	.317538	.317859	.3181791	.318499		Cotang.	
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533664 \\ -353664 \\ -3073566 \\ -322991 \\ -3 - 95050 \\ -9515944 \\ -953564 \\ -3073566 \\ -322991 \\ -3073566 \\ -322991 \\ -3073566 \\ -322991 \\ -3073566 \\ -322991 \\ -3073566 \\ -32291 \\ -3073566 \\ -32291 \\ -322756 \\ -32291 \\ -3$	4. 2652538 : 310189 3. 23837 : 9551062 4635 : 3020926 : 316898 3 · 155584 : 9532786 25 55 : 3076334 : 323312 3 · 092983 : 951 : 050	$5 \cdot \underline{9965416} \cdot \underline{310508} \\ \underline{3220526} \cdot \underline{9550199} \\ 45 \underline{36} \cdot \underline{3023699} \cdot \underline{317218} \\ \underline{3155299} \cdot \underline{9531907} \\ \underline{3456} \cdot \underline{3079102} \cdot \underline{323633} \\ \underline{3079102} \cdot \underline{323633} \\ \underline{307912} \cdot \underline{323633} \\ \underline{30792} \cdot \underline{323633} \\ \underline{30792} \cdot \underline{323633} \\ \underline{30792} \cdot \underline{323633} \\ \underline{30792} \cdot \underline{32363} \\ \underline{30792} \\ 307$	$6 \cdot 2968194 \cdot 310827 \cdot 3221 \cdot 9549336 \cdot 4437 \cdot 3026471 \cdot 317538 \cdot 3 \cdot 149220 \cdot 9531027 \cdot 2357 \cdot 3081869 \cdot 923955 \cdot 3 \cdot 086846 \cdot 9513258 \cdot 951328 \cdot 95128 \cdot 95$	$7\cdot 2970971 + 311146 \\ 3\cdot 213922 + 9548473 \\ 4338 + 3029244 + 317859 \\ 3\cdot 146047 + 9530146 \\ 2258 + 3084636 \\ 3\cdot 24276 \\ 3\cdot 083786 + 952364 \\ 3\cdot 08376 + 952364 \\ 3\cdot 08376 + 952364 \\ 3\cdot 08376 + 952664 \\$	8.2973749931146513-2106301-9547608423891-30320161-31817913-1428801-95292642121591-30874031-32459813-0807321-9511464	$9 \cdot 2976526 \cdot 311784 \cdot 3 \cdot 207344 \cdot 9546743 \cdot 41440 \cdot 3034788 \cdot 318499 \cdot 3 \cdot 139719 \cdot 9528382 \cdot 2060 \cdot 3090170 \cdot 324919 \cdot 3 \cdot 077683 \cdot 9510565 \cdot 32687 \cdot 326$		/ Cosine. Cotang.	
-	12	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		1	
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Cosine.	·9563048	-9562197	·9561345	·9560492	·9559639	.9558785	.9557930	·9557074	.9556218	·9555361	·9554502	.9533643	·9552784	.9551923	-9551062	·9550199	.9549336	-9548473	·9547608	·9546743	.9545876	Sine.	Deg. 72.
Tang. Cotang.	3-270852	3.267452	3-264059	3-260672	3-257292	3-253918	3-250550	3.247189	3.243834	3.240486	3.237143	3.233807	3.230478	3.227154	3.223837	3-220526	3.217221	3.213922	3.210630	3.207344	3.204063	Tang.	
Tang.	305730	.306048	·306367	-306685	-307003	.307321	.307640	.307958	.308277	-308595	.308914	.309233	.309551	.309870	.310189	.310508	.310827	.311146	1-311465	•311784	.312103	Cotang.	
Sine.	7175992	2926499	2929280	2932061	2934842	-2937623	-2940403	2943183	2945963	-2948743	2951522	2954302	2957081	.2959859	-2962638	-2965416	-2968194	.2970971	·2973749	-2976526	20 - 2979303 - 312103 3 - 204063 - 9545876 40	/ Cosine. Cotang.	
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F	0183840018340248800	1	1.
Cosine.	0 -3090170 -324919 3-077683 -9510555 60 21 -3145209 -331686 3-014592 -9491511 3941 -3232374 -333157 2-957205 -9473035 13 1 -3092936 -325561 3-074640 -9509666 59 22 -3155096 -332065 36442 -321646 -33192 59 -54572 -9477107 17 2 -3093457 -325563 -9507656 56 25 -31550730 -332565 -3006103 -9486760 3644 -3211640 -339125 2-947026 -947305 15 3 -3093457 -325563 -9506661 55 26 -3155250 -332378 -300139 -9488760 3644 -321164 0 -339125 -947026 -9457430 15 5 -3103999 -325553 -9506661 55 26 -3155250 -332378 -300319 -9488760 3644 -321164 0 -339129 5 4 -101234 -325630 -9506661 55 26 -3155250 -332378 -3003193 -9488760 3644 -321164 0 -339129 5 5 -3103999 -326528 -9656569 -5505157 54 27 -3164770 -333252 -9494735 -9486081 3248 -321548 -9467430 13 5 -3103599 -326528 -9656569 -950661 55 26 -3165220 -333372 -9486081 3248 -321567 -34027 -9394896 -14 5 -3103599 -326528 -3065459 -950661 55 26 -3165201 -333372 -9948092 -3447 52 -3946739 -946549 12 5 -3103559 -327317 -3055497 -9503348 -5503 -33344 52 -9486081 -3248 -322164 -14010 2 -933699 -346574 6 5 -3117522 -3238138 -9447491 -9501536 50 31 -3175805 -3493176 -9486081 -3248 -322164 -3466854 6 5 -3117522 -328168 -3053487 -9503348 5529 -334945 2556 -3448156 -344156 -345775 2-934682 -946554 6 5 -3117522 -328168 -3053487 -9503348 5529 -333445 2-9486081 -344107 2-933999 -9465776 -946554 6 5 -3117522 -328168 -3053487 -9501536 50 31 -3175805 -33344155 -948159 11 -347752 -293999 -946564 6 5 -3117522 -328168 -3053487 -949586 50 31 -3175805 -3349415 525 -3244678 -344077 2-933999 -9465654 6 5 -3117522 -328168 -30441417 -949721 4 -31752 -9329174 -344401 2 -923099 -9463654 6 5 -3117522 -328168 -3044413 15 -3175805 -335651 2 -948589 -344587 -344207 2 -946584 6 5 -3133440 -330753 -9495684 14 37 -3183721 -393563 -394764 2 -5555 -3244678 -344577 2 -9465954 6 5 -3133440 -330773 -9495684 14 37 -3183721 2-94583 -347464 2 -5555 -3244678 -344078 -344587 -344577 -39458968 4 5 -3133440 -330773 -9495684 14 37 -3184569 -335653 -3947644 2 -5555 -3244678 -344577 2-9456968 4 5 -3133440 -330773 -94	Sine.	Deg. 71.
Tang. Cotang.	0 -3090170 -324919 37077683 -551056 69472005 9473035 1 -30092702 -3255241 37077682 -557205 947737 9473035 2 -3005702 -3255643 -507665 592 -3156590 -332009 3-9489678 3743 -2358855 3-947505 -9477170 3 -30085405 -557265 -3155250 -325559 3-066065 5525 -3155250 -324505 3-945957 -9445967 -947170 3 -30085405 -55724 -3155250 -332023 -9488760 5344 -321749 -3399129 2-945752 -9446967 5 -3100550 -55561 -3162010 -333025 2-991776 -9469301 -9467430 7 -3100550 -3056167 -3104707 -333045 -9463061 -9467430 -9466665 -9477480 -9466767 -9414576 -9446676 -9467430 -946555 -9477480 -946555 -947578 -941677628 -9465667 -9416776	Tang.	
Tang.	 838157 838157 838451 838451 838451 839129 839129 839129 8391752 841077 841401 844327 844327 	Cotang.	
Sine.	3203374 3206130 320885 3211640 3211895 3211395 3211395 3211395 3211395 3221991 322567 322567 3225657 3225657 3225657 3225657 3225657 3226652 3256652 3256652 3256652 3256652 3255682 3255682	/ / Cosine. Cotang.	
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Cosine.	$\begin{array}{c} 9491511\\ 9490595\\ 9489678\\ 9489678\\ 9487842\\ 9487842\\ 9487842\\ 9485081\\ 9485081\\ 9485081\\ 9485081\\ 9483237\\ 94832333\\ 94832333\\ 94832333\\ 94832333\\ 948764\\ 947584\\ 9477684\\ 9477684\\ 9477684\\ 9477684\\ 94778612\\ 94778612\\ 9477867\\ 9477897\\ 94773966\\ 94773966\\ 94773966\\ 94773966\\ 94773966\\ 94773966\\ 9477887\\ 94773966\\ 9477887\\ 94773966\\ 9477887\\ 94773966\\ 9477887\\ 94773966\\ 9477887\\ 94773966\\ 9477887\\ 94773966\\ 9477887$ 9477887\\ 9477887 947787\\ 9477887 947787\\ 9477887 947787\\ 947787 94787 947787 947787 947787 947787 947787 94787 947787 947787 947787 947787 947787 947877 947877 947877 947787 947787 947787 947877 947877 947877 947877 947787 94787787 94787787 94787787 947787787 947877 947787 947787 947877 947877 94787787 947877 9	Sine.	Dog. 71.
Tang. Cotang. Cosine.	3-014892 3-0011960 3-006110 3-006110 3-003193 3-003193 3-003193 3-003193 3-003193 2-991576 2-991473 2-991576 2-991576 2-991473 2-977168 2-98665731 2-965731 2-965731 2-965731 2-965731 2-965731 2-965731	Tang.	
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Tang. Cotang. Cosine. 7	0 -3090170 -324919 3-077683 -9510555 60 1 -3092936 -325241 3-074640 -9509665 59 2 -3095458 -325563 3-071602 9550766 55 3 -3098458 -325563 3-071602 9550615 57 4 -3101234 -325506 3-055542 9550563 55 5 -3103399 -325528 3-055542 95506161 55 6 -3105764 -325585 3-055542 9550451 54 7 -3109529 -327172 3-055492 9550451 54 7 -3109529 -327172 3-055492 9550451 54 7 -3105529 -327481 3-044401 9500529 49 9 -3112204 -327581 3-044401 9500529 49 11 -3112658 -3278461 3-044401 9500529 49 12 -31131658 -3278461 3-044401 9500529 49 12 -31131658 -3278461 3-044401 9500529 49 13 -31126112 -329428 3-044161 9500529 49 12 -31131638 -329750 3-035555 -9496991 45 15 -3131638 -320753 3-035555 -9496991 45 15 -3131638 -320753 3-035555 -9496991 45 17 3137163 -333073 3-023653 -9496991 45 18 -31331638 -329750 3-032555 -9496991 45 17 3137163 -333073 3-023653 -9495168 43 18 -31331638 -333073 3-023653 -9495168 43 19 -314408 -330773 -9493168 43 10 -311764 -330773 -94932168 43 10 -311764 -33073 3-023655 -9495891 45 10 -311764 -33073 3-023655 -9495301 45 10 -311764 -33073 3-023655 -9495301 45 10 -311764 -33073 3-023655 -94953168 43 10 -311764 -33073 3-023655 -94933168 43 10 -311764 -330773 -9493706 44 10 -311764 -330773 -9493706 -349776 -9449700 -36 10 -311764 -330773 -9493706 -349776 -9449700 -36 10 -311764 -33073 3-023655 -9493416 40 10 -311764 -33073 3-0236772 -9493726 44 10 -311764 -330783 -907772 -9493256 44 10 -311448 -331363 -33168 -331044 -3007772 -94932456 40 10 -311448 -331363 -331044 -3002772 -9493246 40 10 -311448 -331363 -3017783 -9493246 40 10 -311448 -331363 -3017783 -9493246 40 10 -310556 -331044 -3007772 -9493256 40 10 -310566 -331044 -3007772 -949326 40 10 -310566 -331044 -3007772 -	Tang.	
	•324919 •325241 •325563 •325584 •325266 •326206 •326206 •326320 •327494 •327494 •327172 •327172 •327494 •327494 •327494 •327494 •3297816 •329420 •3297420 •330778 •329750 •330778 •330778 •330778 •330778	Cotang.	
Sine.	-3090170 -3099268 -30992468 -30992468 -30992468 -3101239 -3101239 -310529 -3115254 -3117525 -3120586 -3123349 -3117525 -31236875 -3126875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -31236875 -312	Cosine. Cotang.	
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	Tang. Cotang. Cosine.	0-3255682-3443272-904210-9455186-60/21-2313379-351175/2-847583-9435122-39441-3357723-27794453-0415686-10	•3258432 •344653 2•901468 •9454238 [59]22 •3316123 •351501 2•844935 •9434157 38 [42 •3370953 •358051 2•79281] •9414705 [18	$\cdot 3261182 \cdot 344978 \cdot 808731 \cdot 9453290 \\ 5823 \cdot 3318867 \cdot 351828 \\ 2842292 \cdot 9433192 \cdot 3743 \\ 3743 \cdot 3373691 \cdot 358380 \\ 28790333 \cdot 9413724 \\ 37247 \\ $	$\cdot 3263932 \cdot 345304 \\ 2 \cdot 895998 \cdot 9452341 \\ 5724 \cdot 3321611 \cdot 352155 \\ 2 \cdot 839653 \cdot 9432227 \\ 3644 \cdot 3376429 \cdot 358768 \\ 2 \cdot 887780 \\ 9412743 \\ 1612743 \\ 161274 \\ 16$	$\cdot 3266681 \cdot 345629 \cdot 2893270 \cdot 9451391 \\ 56 \cdot 25 \cdot 3324355 \cdot 352482 \cdot 2 \cdot 837019 \cdot 9431260 \cdot 3546 \cdot 3379167 \cdot 359036 \cdot 2 \cdot 7852330 \cdot 9411760 \cdot 1560 \cdot 1560$	$-3269430 \cdot 345955 \cdot 2\cdot 890546 \cdot 9450441 \cdot 55 \cdot 26 \cdot 3327098 \cdot 352809 \cdot 2\cdot 834389 \cdot 9430293 \cdot 3446 \cdot 3381905 \cdot 359365 \cdot 2\cdot 782685 \cdot 9410777 \cdot 1282685 \cdot 941077 \cdot 1282685 \cdot 941077 \cdot 1282685 \cdot 9410777 \cdot 1282675 \cdot 128275 \cdot $	$-3272179 \cdot 346281 \cdot 2\cdot887827 \cdot 9449489 \cdot 5429329841 \cdot 353136 \cdot 2\cdot831763 \cdot 9429324 \cdot 3384642 \cdot 359693 \cdot 2\cdot780144 \cdot 9409793 \cdot 3224645 \cdot 3229841 \cdot 3284645 \cdot 328864645 \cdot 32886465 \cdot 32886465 \cdot 32886465 \cdot 32886465 \cdot 32886465 \cdot 328864645 \cdot 32886465 \cdot 32886465 \cdot 328866665 \cdot 32886665 \cdot 32886665 \cdot 328866665 \cdot 328866665 \cdot 328866665 \cdot 328866665 \cdot 328866665 \cdot 32886665 \cdot 32886665 \cdot 32886665 \cdot 3288666665 \cdot 32886665 \cdot 328866665 \cdot 32886665 \cdot 32886655 \cdot 32886655 \cdot 3288665 \cdot 3288665 \cdot 3288665 \cdot 3288665 \cdot 3288665 \cdot 32886655 \cdot 3288655 \cdot 32886555 \cdot 328865555 \cdot 328865555 \cdot 328865555 \cdot 32886555555 \cdot 3288655555 \cdot 32886555555 \cdot 3288655555555 \cdot 3288655555555555555555555555555555555555$	$-3274928 \cdot 346606 \cdot 2 \cdot 885113 \cdot 9448537 \\ \texttt{w}328 \cdot 3332584 \cdot 353464 \cdot 2 \cdot 829142 \cdot 9428355 \\ \texttt{32}48 \cdot 3387379 \cdot 360022 \cdot 2 \cdot 777606 \cdot 9408808 \cdot 3287379 \cdot 3287378 \cdot 3287379 \cdot 32873779 \cdot 3287379 \cdot 32873779 \cdot 3287379 \cdot 32873$	$3277676 \cdot 346932 \cdot 282403 \cdot 9447584 \cdot 5229 \cdot 3335326 \cdot 353791 \cdot 2825525 \cdot 9427386 \cdot 3149 \cdot 3390116 \cdot 360350 \cdot 2\cdot 775073 \cdot 9407822 \cdot 94$	$\cdot 3280424 \cdot 347258 \cdot 2^{\cdot} 379697 \cdot 9446630 \cdot 5130 \cdot 3338069 \cdot 354118 \cdot 2^{\cdot} 823912 \cdot 9426415 \cdot 3050 \cdot 3392852 \cdot 360679 \cdot 2^{\cdot} 772544 \cdot 9406835 \cdot 3292852 \cdot 360679 \cdot 2^{\cdot} 772544 \cdot 9406835 \cdot 2^{\cdot} 726415 \cdot 2^{\cdot} 7$	·9405848	.9404860	.9403871	.9402881	·9401891	.9400899	20666666	9398914	.9397921	·9396926		Sine.	
	Cotang.	2.795453	2.792891	2.790333	2.787780	2.785230	2.782685	2.780144	2.777606	2.775073	2.772544	2.770019	2.767499	2.764982	2.762469	2.759960	2.757456	2.754955	2.752458	2.749966	2.747477	Ŷ	Tang.	1
	Tang.	.357723	.358051	.358380	358708	-359036	-359365	-359693	-360022	·360350	·360679	·361008	·361337	·361666	·361994	·362324	.362653	.362982	.363311	.363640	.363970		Cotang.	D
D	Sine.	.3368214	·3370953	-3373691	.3376429	.3379167	·3381905	.3384642	.3387379	.3390116	.3392852	.3395589	.3398325	.3401060	.3403796	·3406531	.3409265	.3412000	3414734	.3417468	3420201		Cosine. Cotang.	
	-	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	69	60		1	
	-	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20		-	
	Cotang. Cosine.	-9435122	·9434157	.9433192	·9432227	.9431260	.9430293	·9429324	·9428355	.9427386	·9426415	·9425444	.9424471	-9423498	.9422525	-9421550	.9420575	.9419598	9418621	·9417644	.9416665		Sine.	
		2.847583	2.844935	2.842292	2.839653	2.837019	2-834389	2.831763	2.829142	2.826525	2.823912	2.821304	2.818700	2.816100	2.813504	2.810913	2.808326	2.805743	2.803164	2.800590	2.798019		Tang.	
	Tang.	.351175	·351501	.351828	.352155	·352482	·352809	·353136	·353464	.353791	·35411S	·354446	·354773	·355101	.355428	.375756	·356084	.356411	·356739	.357067	.357395	14	Cotang.	
	Sine.	.3313379	·3316123	·3318867	·3321611	·3324355	·3327098	·3329841	·3332584	.3335326	·33338069	·3340810	·3343552	·3346293	·3349034	.3351775	3354516	3357256	33599996	3362735	3365475		/ / Cosine. Cotang.	
-	- 1	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	10		-	
	-	60	59	58	57	56	55	54	83	52	51	50	49	48	47	46	45	44	43	42	41	40	-	
	Cosine.	.9455186	·9454238	·9453290	·9452341	·9451391	·9450441	·9449489	.9448537	·9447584	·9446630	$0 \cdot 3283172 \cdot 347584 \cdot 3876997 \cdot 9445675 \cdot 50 \cdot 31 \cdot 3340810 \cdot 354446 \cdot 2 \cdot 821304 \cdot 9425444 \cdot 29 \cdot 51 \cdot 3395589 \cdot 361008 \cdot 2 \cdot 770019 \cdot 9405848 \cdot 200019 \cdot 200000000000000000000000000000000000$	$1\cdot 3285919 \cdot 347910 \cdot 2\cdot 874300 \cdot 9444720 \cdot 49 \cdot 3243552 \cdot 354773 \cdot 2\cdot 818700 \cdot 9424471 \cdot 28 \cdot 53398325 \cdot 361337 \cdot 2\cdot 767499 \cdot 9404860 \cdot 9404860 \cdot 9424471 \cdot 2\cdot 852 \cdot 33398325 \cdot 361337 \cdot 2\cdot 767499 \cdot 9404860 \cdot 940660 \cdot 940660 \cdot 940660 \cdot 940660 \cdot 940660 \cdot 940660 \cdot 94060 \cdot 940600 \cdot 94060 \cdot 94060 \cdot 94060 \cdot 94060 \cdot 94060 \cdot$	$2^{+}3^{2}88666 \cdot 348236 \cdot 348236 \cdot 341608 \cdot 9443764 \cdot 4833 \cdot 3346293 \cdot 35510 \cdot 2 \cdot 816100 \cdot 9423498 \cdot 2753 \cdot 3401060 \cdot 361666 \cdot 2 \cdot 764982 \cdot 9403871 \cdot 92403871 \cdot 9240371 \cdot 924071 \cdot 9240771 \cdot 924071 \cdot 924071 $	$13 \cdot 3291413 \cdot 348568 \\ 2 \cdot 868921 \cdot 9442807 \\ 4 \cdot 34 \cdot 3349034 \cdot 355428 \\ 2 \cdot 813504 \cdot 9422525 \\ 2 \cdot 654 \cdot 3403796 \cdot 361994 \\ 2 \cdot 762469 \cdot 9402881 \\ 2 \cdot 7624881 \\ 2 \cdot 762881 \\ 2 \cdot 76288$	4.3294160 348889 2.866238 9441849 46 35 3351775 355756 2.810913 9421550 25 55 346531 362324 2.759960 9401 891	$ \begin{array}{c} 5^{\circ}3296906 \cdot 349215 \\ 2^{\circ}863560 \cdot 9410890 \\ 45^{\circ}1516 \cdot 3565415 \\ 251516 \cdot 1516 \cdot 1516 \\ 1516 \cdot 1516 \\ 1516 \cdot 1515 \\ 151515 \\ 1516 \cdot 1515 \\ 15151515 \\ 15151515 \\ 15151515 \\ 15151515 \\ 15151515 \\ 1515151515 \\ 1515151515 \\ 15151515 \\ 15151515 \\ 1515151515 \\ 1515151515 \\ 1515151515 \\ 151515151515 \\ 1515151515151515$	$6 [\cdot 3299653 \cdot 349542 2 \cdot 860886 \cdot 943931 44 37 \cdot 3357256 \cdot 356411 2 \cdot 805743 \cdot 9419598 \cdot 23412000 \cdot 362982 2 \cdot 754955 \cdot 9399907 \cdot 1000 $	$17^{-3302398} \cdot 349868 \cdot 2 \cdot 858216 \cdot 9438971 \cdot 43 \cdot 38 \cdot 3359996 \cdot 356739 \cdot 2 \cdot 8031 \cdot 64 \cdot 94 \cdot 18621 \cdot 22 \cdot 53 \cdot 341 \cdot 47 \cdot 36 \cdot 331 \cdot 2 \cdot 75 \cdot 24 \cdot 939 \cdot 93$	$18^{-3305144} \cdot 350195 \\ 2855551 \cdot 9438010 \\ 4239 \cdot 357057 \\ 357067 \\ 2800590 \cdot 9417 \\ 644 \cdot 2159 \cdot 3417468 \\ \cdot 363640 \\ 274996 \\ 6939792 \\ 192780 \\ 292785 \\ 192780 \\ 292785 \\ 192780 \\ 292785 \\ 192878 \\ 292878 \\ 192878 \\ 192878 \\ 192878 \\ 192878 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 19288 \\ 1028$	$19 \cdot 3307889 \cdot 350521 \left[2 \cdot 552891 \right] \cdot 9437048 \left[41 \left[10 \right] \cdot 3365475 \right] \cdot 357395 \left[2 \cdot 798019 \right] \cdot 9416665 \left[20 \left[60 \right] \cdot 3420201 \right] \cdot 363970 \left[2 \cdot 747477 \right] \cdot 9396926 \left[2 \cdot 7477 \right] \cdot 9366926 \left[2 \cdot 7477 \right] \cdot $	20 • 3310634 • 350848 2 • 850234 • 9436085 40	Sine.	C a
	T'ang. Cotang.	2.904210	2.901468	2-898731	2.895998	2.893270	2.890546	2.887827	2.885113	2.882403	2.879697	2-876997	2.874300	2.871608	2.868921	2-866238	2.863560	2-860886	2.858216	2-855551	2.852891	2-850234	Tang.	-
	Tang.	-344327	·344653	.344978	·345304	.345629	.345955	·346281	.346606	·346932	.347258	.347584	.347910	.348236	.348563	·348889	.349215	·349542	.349868	.350195	.350521	.350848	Cotang.	
	Sine.	.3255682	.3258432	.3261182	·3263932	·3266681	.3269430	.3272179	.3274928	.3277676	.3280424	.3283172	.3285919	.3288666	.3291413	.3294160	.3296906	.3299653	.3302398	·3305144	.3307889	•3310634	' Cosine. Cotang.	
	- 1	0.	-	53	ŝ	4.	S	9	2	00	6	10	I	12	13	14	15	16	17	18	19	21	-	

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Deg. 70.

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-	19	18	17	16	15	14	13	12	II	10	6	00	2	6	10	4	3	65	-	0		~	69
Cosine.	·9355468	·9354440	·9353412	.9352382	·9351352	·9350321	.9349289	.9348257	.9347223	·9346189	·9345154	.9344119	·9343082	·9342045	·9341007	.9339968	·9338928	·9337888	-9336846	·9335804	1.1.1	Sine.	Deg. 69.
Cotang.	2.648753	2.646423	2.644096	2.641774	2.639454	2.637139	2.634827	2.632518	2.630213	2.627912	2-625614	2.623319	2.621028	2.618741	2.616457	2.614176	2.611899	2.609625	2.607355	2.605089		Tang.	
Tang.	.377536	·377868	.378201	378533	·378866	-379198	.379531	·379864	-380197	.380530	.380863	·381196	·381529	·381862	.382196	.382529	·382863	·383196	383530	·383864		Cotang.	
Sine.	.3532027	·3534748	·3537469	·3540190	.3542910	·3545630	.3548350	.3551070	.3553789	.3556508	.3559226	·3561944	·3564662	·3567380	·3570097	·3572814	.3575531	.3578248	·3580964	.3583679		Cosine. Cotang.	
1,	3941	3S 42	3743	3644	3545	3446	3347	32 48	3149	30 50	29 51	28 52	2753	26 54	25 55	24 56	23.57	22 58	21 59	20 60		11	9.
Cosine.	-9375858	·9374846	.9373833	.9372820	9371806	06207690	·9369774	9368758	·9367740	.9366722	9365703	.9364683	.9363662	.9362641	·9361618	9360595	1769559.	·9358547	9357521	.9356495	10	Sine.	Deg. 69.
Cotang.	2.696118	2.693714	2.691314	2.688919	2.686526	2.684138	2.681753	2.679372	2.676995	2.674621	2.672251	2.669885	2.667522	2-665163	2.662808	2.660456	2.658108	2.655764	2.653423	2;651086		Tang.	
Tang.	.370903	·371234	.371565	.371896	.372227	.372559	.372890	.373221	.373553	·373884	.374216	·374547	·374879	.375211	·375543	.375875	.376207	.376539	178376871	-377203		Cotang.	
Sine.	.3477540	.3480267	·3482994	·3485720	·3488447	·3491173	·3493898	·3496624	·3499349	*3502074	·3504798	.3507523	.3510246	.3512970	.3515693	.3518416	.3521139	.3523862	.3526584	.3529306	-	/ / Cosine. Cotang.	
1	021	922	823	7 24	6 25	5 26	427	3 28	2 39	1 30	031	932	933	734	635	536	437	338	2 39	140	0		
Cosine.	0 • 3420201 • 363970 2• 747477 • 9396926 60 21 • 3477540 • 370903 2• 696118 • 9375858 3941 • 3532027 • 377536 2• 648753 • 9355468 19	$\cdot 3422935 \cdot 364299 \cdot 2744992 \cdot 9395931 \\ 5922 \cdot 3480267 \cdot 371224 \cdot 2693714 \cdot 9374846 \\ 3842 \cdot 3534748 \cdot 377868 \cdot 2646423 \cdot 9354440 \\ 18 \cdot 3534745 \cdot 377868 \cdot 3778688 \cdot 377868 \cdot 377868768 \cdot 377868 \cdot 377868 \cdot 3778688 \cdot 3$	$\cdot 3425668 \cdot 364629 \cdot 2 \cdot 742512 \cdot 9394935 \cdot 5823 \cdot 3482994 \cdot 371565 \cdot 591314 \cdot 937333 \cdot 37143 \cdot 3537469 \cdot 378201 \cdot 2 \cdot 644096 \cdot 9353412 \cdot 172512 \cdot 93743 \cdot 37143 \cdot 3$	$\cdot 3428400 \cdot 364958 \cdot 240035 \cdot 9393938 \cdot 5724 \cdot 3455720 \cdot 371896 \cdot 2688919 \cdot 9372820 \cdot 36444 \cdot 3540190 \cdot 378533 \cdot 2641774 \cdot 9352382 \cdot 166723 \cdot 2641774 \cdot 9352382 \cdot 166723 \cdot 16723 \cdot 166723 \cdot 16$	$\cdot 3431133 \cdot 365288 \\ \texttt{2} \cdot 737562 \cdot 9392940 \\ \texttt{56} \texttt{26} \texttt{2} \texttt{5} \texttt{2} \texttt{48} \texttt{44} \texttt{7} \\ \texttt{37} \texttt{22} \texttt{7} \texttt{2} \texttt{68} \texttt{6526} \\ \texttt{93} \texttt{18} \texttt{6} \texttt{3} \texttt{5} \texttt{42} \\ \texttt{5} \texttt{5} \texttt{2} \texttt{29} \texttt{10} \\ \texttt{13} \texttt{12} \texttt{5} \texttt{15} \\ \texttt{5} \texttt{5} \texttt{5} \texttt{10} \\ \texttt{13} \texttt{12} \texttt{5} \texttt{5} \texttt{5} \texttt{5} \texttt{5} \texttt{5} \texttt{5} 5$	$\cdot 3433865 \cdot 365618 \cdot 2 \cdot 735093 \cdot 9391942 \cdot 5526 \cdot 3491173 \cdot 372559 \cdot 3684138 \cdot 9370790 \cdot 3446 \cdot 3545630 \cdot 379198 \cdot 2 \cdot 37139 \cdot 9350321 \cdot 14 \cdot 148 \cdot$	$\cdot 3436591 \cdot 365948 \cdot 733628 \cdot 9390943 \cdot 5427 \cdot 3493898 \cdot 372890 \cdot 2\cdot681753 \cdot 9369774 \cdot 33477 \cdot 3548350 \cdot 379531 \cdot 2\cdot634827 \cdot 9349289 \cdot 13 \cdot 2\cdot237 \cdot 2\cdot27 \cdot 2$	$\cdot 3439329, \cdot 366277 \\ 2 \cdot 730167, \cdot 9389943 \\ (53/28) \cdot 3496624 \\ \cdot 373221 \\ (2 \cdot 679372 \\ \cdot 9368758 \\ (3 \cdot 3268758 \\ \cdot 37486 \\ \cdot 3551070 \\ (3 \cdot 79864 \\ 2 \cdot 632518 \\ \cdot 9348257 \\ (1 \cdot 2 \cdot 3258 \\ \cdot 3268758 \\ \cdot $	$8 \cdot 3442060 \cdot 366607 \cdot 727710 \cdot 9383942 \cdot 52329 \cdot 3499349 \cdot 373553 \cdot 576995 \cdot 9367740 \cdot 3149 \cdot 3553739 \cdot 380197 \cdot 2630213 \cdot 9347223 \cdot 12323 \cdot 123233 \cdot 123233 \cdot 123233 \cdot 123233 \cdot 12$	$9 \cdot 344479 \cdot 366937 \cdot 725256 \cdot 9387940 \cdot 5130 \cdot 3502074 \cdot 373884 \cdot 574621 \cdot 9366722 \cdot 3050 \cdot 3556508 \cdot 380530 \cdot 2627912 \cdot 9346189 \cdot 12627 \cdot $	$0 \cdot 3447521 \cdot 367268 \cdot 2 \cdot 722307 \cdot 9386938 \cdot 5031 \cdot 3504798 \cdot 374216 \cdot 2 \cdot 672251 \cdot 9365703 \cdot 29515 \cdot 3559226 \cdot 380863 \cdot 2 \cdot 625614 \cdot 9345154 \cdot 9345154 \cdot 936576 \cdot 2 \cdot $	$1\cdot 3450252\cdot 367598 \\ 2\cdot 720362 \cdot 9385934 \\ 4932 \cdot 3507523 \cdot 374547 \\ 2\cdot 669885 \cdot 9364633 \\ 2856 \cdot 3561944 \cdot 381196 \\ 2\cdot 623319 \cdot 934119 \\ 3\cdot 314547 \\ 3\cdot 316194 \cdot 311196 \\ 3\cdot 32819 \cdot 32819 \\ 3\cdot 32812 \cdot 32812 \\ 3\cdot 32812 - $	$\cdot 3452982 \cdot 367928 \cdot 2717920 \cdot 9384930 \cdot 4833 \cdot 3510246 \cdot 374879 \cdot 2667522 \cdot 9363662 \cdot 2753 \cdot 3564662 \cdot 381529 \cdot 2\cdot621028 \cdot 9343082 \cdot 3242082 \cdot 324266 \cdot 324666 \cdot 324266 \cdot 324666 \cdot 3246666 \cdot 324666 \cdot 3246666 \cdot 32466666 \cdot 32466666 \cdot 3246666 \cdot 3246666 \cdot 3246666 \cdot 32466666 \cdot 324666666 \cdot 32466666 \cdot 324666666 \cdot 324666666 \cdot 324666666666666666666666666666666666666$	$3 \cdot 3455712 \cdot 368258 \\ 2 \cdot 715482 \cdot 9383925 \\ 4 \cdot 734 \cdot 3512970 \cdot 375211 \\ 2 \cdot 655163 \cdot 9362641 \\ 2 \cdot 65163 \cdot 9362641 \\ 2 \cdot 651 \cdot 3567380 \\ - 3567380 \\ - 381862 \\ 2 \cdot 618741 \\ - 9342045 \\ - 934045 \\ - 93$	$14^{+}3458441^{+}3685892^{-}713048^{+}9382920^{+}4635^{+}3515693^{+}375543^{+}2662808^{+}9361618^{+}255^{+}55^{+}70097^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616457^{+}9341007^{+}382196^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}382166^{+}2^{-}616767^{+}2^{-}6167677^{+}382166^{+}2^{-}6167677^{+}382166^{+}2^{-}6167677^{+}2^{-}61676777^{+}2^{-}61676777^{+}2^{-}6167677777^{+}2^{-}61676777777777777777777777777777777777$	$15 \cdot 3461171 \cdot 368919 \cdot 2 \cdot 710618 \cdot 9381913 \cdot 4536 \cdot 3518416 \cdot 375875 \cdot 2660456 \cdot 9360595 \cdot 2456 \cdot 3572814 \cdot 382529 \cdot 2 \cdot 614176 \cdot 9339968 \cdot 2 \cdot $	$[6] \cdot 3463900 \\ \cdot 369250 \\ 2 \cdot 708192 \\ \cdot 9380906 \\ 4437 \\ \cdot 3521139 \\ \cdot 352139 \\ \cdot 3526207 \\ \cdot 2\cdot 658108 \\ \cdot 9359571 \\ \cdot 2357 \\ \cdot 357531 \\ \cdot 3575531 \\ \cdot 3575531 \\ \cdot 382863 \\ \cdot 2\cdot 611899 \\ \cdot 9338928 \\ \cdot 9338928 \\ \cdot 938928 \\ \cdot 93888 \\ \cdot 938888 \\ \cdot 93888 \\ \cdot 9388$	$17 \cdot 3466628 \cdot 369580 \cdot 2 \cdot 705769 \cdot 937988 \cdot 4238 \cdot 3523862 \cdot 376539 \cdot 2 \cdot 655764 \cdot 9358547 \cdot 2258 \cdot 3578248 \cdot 383196 \cdot 2 \cdot 609625 \cdot 9337888 \cdot 238248 \cdot 383196 \cdot 2 \cdot 609625 \cdot 9337888 \cdot 238248 \cdot 23828 \cdot 238248 \cdot 23828 \cdot 23882 \cdot 23888 \cdot 23828 \cdot 23888 \cdot 23888 \cdot 23828 \cdot 23888 \cdot 23828 \cdot 23888 \cdot 238888 \cdot 238888 \cdot 238888 \cdot 23888 \cdot 238888 \cdot 23888 \cdot 238888 \cdot 23888 \cdot 23888$	$[8] \cdot 3469357 \cdot 369911 [2 \cdot 703351 \cdot 9378889] \cdot 42391 \cdot 3526584 \cdot 376871 [2 \cdot 653423] \cdot 9357521 [2159] \cdot 3580964 \cdot 383530 [2 \cdot 607355] \cdot 9336846 \cdot 326874 \cdot 3268774 \cdot 3268776 \cdot 32687$	$19^{-3472085} \cdot 370242^{-27700936} \cdot 9377880^{-1}40^{-3529306} \cdot 377203^{-2}651086^{-9356495} \cdot 20^{-0}60^{-3583679} \cdot 383864^{-2} \cdot 605089^{-9335804} \cdot 383864^{-1} \cdot 286566^{-1} \cdot 28666^{-1} \cdot 286666^{-1} \cdot 2866666^{-1} \cdot 286666^{-1} \cdot 286666^{-1} \cdot 286666^{-1} \cdot 286666^{-1} \cdot 2866666^{-1} \cdot 2866666^{-1} \cdot 28666666666^{-1} \cdot 28666666^{-1} \cdot 28666666666666^{-1} \cdot 2866666666^{-1$	20 -3474812 -370572 2-698525 -9376869 40	Sine.	Deg. 69.
Cotang.	2-747477	2.744992	2.742512	2.740035	2.737562	2.735093	2.732628	2.730167	2.727710	2:725256	2.722307	2.720362	2.717920	2.715482	2.713048	2.710618	2.708192	2.705769	2.703351	2.700936	2.698525	Tang.	
Tang.	.363970	.364299	.364629	·364958	.365288	.365618	.365948	.366277	-366607	·366937	367268	.367598	.367928	.368258	.368589	.368919	.369250	.369580	.369911	.370242	.370572	Cotang.	
Sine.	.3420201	.3422935	3425668	.3428400	.3431133	.3433865	.3436597	.3439329	.3442060	.3444791	.3447521	.3450252	.3452982	.3455712	·3458441	.3461171	3463900	.3466628	.3469357	.3472085	.3474812	Cosine. Cotang.	-
-	0	-	63	3	4	10	9	2	00	6	10	11	12	13	14	15	16	17	18	19	20	1-	1

21 Deg.

	-	19	18	17	16	15	14	13	12	11	10	6	00	2	9	10	4	3	62	-	0	-	-	œ
	Cosine.	·9292401	-9291326	·9290250	.9289173	.9288096	7107820-	.9285938	·9284858	.9283778	.9282696	·9281614	-9280531	.9279447	-9278363	7727729.	.9276191	.9275104	-9274016	.9272928	.9271839	Here and	Sine.	Deg. 68.
	Cotang.	2.515018	2.512889	2.510762	2.508639	2-506519	2.504402	2.502289	2.500178	2.498070	2.495966	2.493864	2.491766	2.489670	2-487578	2.485488	2.483402	2.481319	2.479238	2.477161	2.475086		Tang.	
	'Tang.	-397611	.397948	.398285	-398622	·398959	·399296	·399634	17999971	·400308	-400646	·400984	·401321	·401659	·401997	-402335	.402673	·403011	·403349	-403687	-404026		Cotang.	
21 Deg.	Sine.	.3694765	-3697468	.3700170	-3702872	·3705574	·3708276	-3710977	.3713678	.3716379	·3719079	.3721780	.3724479	.3727179	.3729878	·3732577	·3735275	.3737973	.3740671	3743369	-3746066		' Cosine. Cotang.	
21	-	941	842	743	644	545	446	347	2 48	149	050	951	852	7 53	6 54	555	456	357	2 58	1 59	090			æ
	Cosine /	·9313739 3	·9312679 3	·9311619 3	·93105583	·9309496 3	·9308434 3	·9307370 3	-9306306 3	·9305241 3	·9304176 3	·9303109 2	·9302042 2	·9300974 2	·9299905 2	.9298835 2	·9297765 2	-9296694 2	·9295622 2	·9294549 2	.9293475/2		Sine.	Deg. 68.
	Cotang.	2.558268	2.556075	2.553885	2.551699	2.549516	2.547335	2.545159	2.542985	2.540815	2.538647	2.536483	2.534323	2.532165	2.530011	2.527359	2.525711	2.523566	2.521424	2.519286	2.517150		Tang.	
	Tang.	•390889	·391224	·391560	·391895	·392231	.392567	.392902	·393238	·393574	.393910	.394246	·394582	·394918	·395255	.395591	.395928	·396264	·396601	-396937	.397274		Cotang.	
21 Deg.	Sine.	.3640641	·3643351	·3646059	.3648768	.3651476	·3654184	.3656891	·3659599	.3662306	.3665012	·3667719	.3670425	.3673130	3675836	·3678541	.3681246	.3683950	.3686654	.3689358	·3692061		/ Cosine.	
21	-	021	922	323	724	325	526	127	328	229	1 30	031	932	833	734	635	5 36	137	338	2 39	140	0	-	
	Cosine.	0.3583679.383864 2.605089 9335804 60[21.3640641 390389 2.558268 9313739 3941 3694765 397611 2.515018 9292401 19	$1 \cdot 3586395 \cdot 384197 \left[2 \cdot 602825 \right] \cdot 9334761 \left[592 \left[3643351 \right] \cdot 391224 \left[2 \cdot 556075 \right] \cdot 9312679 \left[38\right] 42 \left[3697468 \right] \cdot 397948 \left[2 \cdot 512889 \right] \cdot 9291326 \left[18\right] + 3256395 \left[38\right] + 3256395 \left[38\right$	$\cdot 3589110 \cdot 384531 \\ 2 \cdot 600565 \\ 9 333718 \\ 5823 \\ \cdot 3646059 \cdot 391560 \\ \cdot 253885 \cdot 9311619 \\ \cdot 3743 \cdot 3700170 \\ \cdot 398285 \\ \cdot 2510762 \cdot 9290250 \\ \cdot 1020 \\$	$3 \cdot 35 \cdot 1825 \cdot 384865 \cdot 2 \cdot 598309 \cdot 9332673 \cdot 5724 \cdot 3648768 \cdot 391895 \cdot 2 \cdot 551699 \cdot 9310558 \cdot 3644 \cdot 3702872 \cdot 398622 \cdot 2 \cdot 508639 \cdot 9289173 \cdot 1668 \cdot 1268 \cdot 1$	$4 \cdot 3594540 \cdot 385199 \cdot 2\cdot 596056 \cdot 9331628 \cdot 5623 \cdot 3651476 \cdot 392231 \cdot 2\cdot 49516 \cdot 9309496 \cdot 35445 \cdot 3705574 \cdot 398959 \cdot 2\cdot 506519 \cdot 9288096 \cdot 15 \cdot 2\cdot 12 \cdot 2\cdot$	$5 \cdot 3597254 \cdot 385533 \cdot 2\cdot 593806 \cdot 9330582 \\ \\ 55 \cdot 264184 \cdot 392567 \cdot 2\cdot 547335 \cdot 9308434 \\ \\ 34 \cdot 46 \cdot 3708276 \cdot 399296 \\ \\ \\ 82 \cdot 504402 \cdot 9287017 \\ \\ 14 \cdot $	$\cdot 3599968 \cdot 385867 \cdot 2 \cdot 591560 \cdot 9329535 \cdot 5427 \cdot 3656891 \cdot 392902 \cdot 2 \cdot 545159 \cdot 9307370 \cdot 3347 \cdot 3710977 \cdot 399634 \cdot 2 \cdot 502289 \cdot 9285938 \cdot 13710977 \cdot 399634 \cdot 2 \cdot 502289 \cdot 9285938 \cdot 128567 \cdot 12857 \cdot 128577 \cdot 1285777 \cdot 128577 \cdot 128577 \cdot 128577 \cdot 128577 \cdot 1285777 \cdot 128577 \cdot 1285777 \cdot 1285777 \cdot 128577 \cdot 128577 \cdot 1285777 \cdot 1285777 \cdot 1285777 \cdot 128577 \cdot 128577$	$7 \cdot 3602682 \cdot 386202 \cdot 2\cdot 589317 \cdot 9328488 \cdot 5328 \cdot 3659599 \cdot 393238 \cdot 2\cdot 542985 \cdot 9306306 \cdot 32148 \cdot 3713878 \cdot 399971 \cdot 2\cdot 500178 \cdot 9284858 \cdot 12\cdot 2\cdot 560118 \cdot 36284858 \cdot 12\cdot 2\cdot 5684858 \cdot 12\cdot 2\cdot 5684858 \cdot 12\cdot 2\cdot 5684858 \cdot 12\cdot 2\cdot 2$	$\cdot 3605395 \cdot 386536 \cdot 2\cdot 587078 \cdot 9327439 \cdot 5229 \cdot 3662306 \cdot 393574 \cdot 2\cdot 540815 \cdot 9305241 \cdot 3149 \cdot 3716379 \cdot 400308 \cdot 2\cdot 498070 \cdot 9283778 \cdot 32605395 \cdot 326536 \cdot 326566 \cdot 326536 \cdot 326566 \cdot 32656 \cdot 326566 \cdot 32666 \cdot 326666 \cdot 3266666 \cdot 3266666 \cdot 3266666 \cdot 32666666 \cdot 3266666 \cdot 3266666 \cdot 326666666666$	$9 \cdot 3608108 \cdot 386870 \cdot 548482 \cdot 9326390 \cdot 51 \cdot 30 \cdot 3665012 \cdot 393910 \cdot 538647 \cdot 9304176 \cdot 30 \cdot 5719079 \cdot 400646 \cdot 2 \cdot 495966 \cdot 9282696 \cdot 92866 \cdot 9$	$0 \cdot 3610821 \cdot 387205 \\ 2 \cdot 582609 \cdot 9325340 \cdot 5031 \cdot 3667719 \cdot 3942345 \\ 2 \cdot 536483 \cdot 9303109 \cdot 2951 \cdot 3721780 \cdot 400984 \\ 2 \cdot 400984 $	$1 \cdot 3613534 \cdot 387539 \cdot 260380 \cdot 9324290 \cdot 4932 \cdot 3670425 \cdot 394582 \cdot 2534323 \cdot 9302042 \cdot 2852 \cdot 3724479 \cdot 401321 \cdot 29491766 \cdot 9280531 \cdot 294323 \cdot 2926473 \cdot 2926473 \cdot 2926767 \cdot 2926723 \cdot 292723 \cdot 2$	$\textbf{2} \cdot \textbf{3616246} \cdot \textbf{387874} \\ \textbf{2} \cdot \textbf{578153} \cdot \textbf{9323238} \textbf{48} \textbf{33} \cdot \textbf{3673130} \cdot \textbf{394918} \\ \textbf{2} \cdot \textbf{532165} \cdot \textbf{9300974} \\ \textbf{2753} \cdot \textbf{377179} \cdot \textbf{401659} \\ \textbf{2} \cdot \textbf{489670} \cdot \textbf{9279447} \\ \textbf{3757179} \cdot \textbf{401659} \\ \textbf{375777} \\ \textbf{3757777} \\ \textbf{37577777} \\ \textbf{37577777} \\ \textbf{37577777} \\ \textbf{37577777} \\ \textbf{37577777} \\ \textbf{375777777} \\ \textbf{3757777777} \\ 37577777777777777777777777777777777777$	$13 \cdot 3618958 \cdot 388209 \cdot 2 \cdot 575931 \cdot 9322186 \cdot 4734 \cdot 3675836 \cdot 395255 \cdot 2 \cdot 530011 \cdot 9299905 \cdot 26 \cdot 54 \cdot 3729878 \cdot 401997 \cdot 2 \cdot 487578 \cdot 9278363 \cdot 3923957 \cdot 2 \cdot $	$14^{-3}621669^{-3}88543^{-2}573711^{-9}321133^{-4}6^{-3}5^{-3}678541^{-3}95591^{-2}527859^{-9}298835^{-2}5^{-5}5^{-5}5^{-5}5^{-2}77^{-4}02335^{-2}248548^{-9}277277^{-2}72777^{-2}72777^{-2}72777^{-2}72777^{-2}7777^{-2}72777^{-2}72777^{-2}72777^{-2}7777^{-2}7777^{-2}77777^{-2}777777^{-2}777777777^{-2}777777777777777777777777777777777777$	$15 \cdot 3624380 \cdot 388878 \cdot 2 \cdot 571495 \cdot 9320079 \cdot 45 \cdot 3681246 \cdot 395928 \cdot 525711 \cdot 9297765 \cdot 24 \cdot 56 \cdot 3735275 \cdot 402673 \cdot 2 \cdot 483402 \cdot 9276191 \cdot 323675 \cdot 23675 \cdot 23675$	$16 \cdot 3627091 \cdot 389213 \cdot 2 \cdot 569283 \cdot 9319024 \cdot 44 \cdot 3683950 \cdot 396264 \cdot 2 \cdot 523566 \cdot 92366694 \cdot 23 \cdot 57 \cdot 3737973 \cdot 403011 \cdot 2 \cdot 481319 \cdot 9275104 \cdot 128131 \cdot 281310 \cdot 2813100 \cdot 2813100 \cdot 2813100 \cdot 2813100 \cdot 2813100 \cdot 28131000 \cdot 28131000 \cdot 28131000 \cdot 28131000 \cdot 281310000 \cdot 281310000 \cdot 281310000 \cdot 281310000000 \cdot 2813100000000000000000000000000000000000$	$17 \cdot 3629802 \cdot 389548 \cdot 2 \cdot 567073 \cdot 9317969 \cdot 4338 \cdot 3686654 \cdot 396601 \cdot 2 \cdot 521424 \cdot 9295622 \cdot 2258 \cdot 3740671 \cdot 403349 \cdot 2 \cdot 479238 \cdot 9274016 \cdot 12 \cdot $	$18 [\cdot 3632512 \cdot 389883] 2 \cdot 564867 [\cdot 9316912] 42 [39 \\ \cdot 368935 [\cdot 396937] 2 \cdot 519286 [\cdot 9294549] 21 [59 [\cdot 3743369] 403687] 2 \cdot 47161 [\cdot 9272928] 2 \cdot 2869] 2 \cdot 2869$	$19^{-3635222} \cdot 390218 \cdot 2 \cdot 562664 \cdot 9315855 \cdot 41 \cdot 40 \cdot 3692061 \cdot 397274 \cdot 2 \cdot 517150 \cdot 9293475 \cdot 20 \cdot 60 \cdot 3746066 \cdot 404026 \cdot 2 \cdot 475086 \cdot 9271839 \cdot 2 \cdot $	20 3637932 390554 2.560464 9314797 40	Sine.	Deg. 68.
	Cotang.	2.605089	2.602825	2.600565	2.598309	2.596056	2.593806	2.591560	2.589317	2.587078	2.584842	2.582609	2.580380	2.578153	2.575931	2.573711	2.571495	2.569283	2.567073	2.564867	2.562664	2.560464	Tang.	
	Tang.	.383864	.384197	.384531	·384865	.385199	.385533	-385867	-386202	.386536	.386870	.387205	.387539	·387874	.388209	.388543	-3388378	.389213	.389548	-389883	-390218	.390554	Cotang	
1 Deg.	Sine.	.3583679	.3586395	.3589110	.3591825	·3594540	·3597254	.3599968	.3602682	.3605395	·3608108	.3610821	•3613534	.3616246	-3618958	.3621669	•3624380	-3627091	-3629802	.3632512	·3635222	-3637932	Cosine. Cotang.	
H	- 1	0	1	65	3	4	5	9	2	00	6	10	11	12	13	14	15	16	17	18	19	2	-	

22 Deg.

NATURAL SINES AND TANGENTS TO A RADIUS 1.

22 Deg.

22 Deg.

| | 6 | 00 | 1 | 9 | 15
 | 14 | 3 | 53
 | - | 0 | 6 | 8
 | 2 | 8 | 10
 | 4 | 3 | 52 | 1
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|---------|---|--|--|--
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	•3746066 404026 2.475086 9271839 6021 3802634 411149 2.432204 9248782 3941 3856377 417967 2.392531 9226503 19	111
 | | 8 1 | 2 1
 | 4 1 | 51 | 9 | 9
 | 9 | 4 | 52
 | 6 | 10 | 0 | 10
 | 6 | - | - | |
| Cosine. | 650 | 538 | 125 | 313 | 102
 | 88 | 220 | 863
 | 150 | 37 | 524 | Iti
 | 298 | 185 | 220
 | 358 | 345 | 732 | 318
 | 504 | | Sine. | |
| SOC | 22 | 22 | 224 | 225 | 222
 | 220 | 219 | 218
 | 217 | 216 | 215 | 214
 | 215 | 21] | 21.0
 | 205 | 208 | 207 | 206
 | 205 | | Sil | 1 |
| | 6. | ç | 6 | 6 | é
 | 6 | 6. | 6.
 | 6 | 6. | 6. | 6.
 | 6. | 6 | 6
 | 6 | 6. | 6. | 6.
 | 6. | 1 | _ | |
| Cotang. | 531 | 576 | 325 | 375 | 29
 | 185 | 344 | 906
 | 040 | 37 | 106 | 179
 | 254 | 331 | 111
 | 194 | 580 | 368 | 759
 | 352 | 1 | 50 | |
| ota | 92 | 906 | 88 | 866 | 847
 | 82 | 808 | 780
 | 765 | 750 | 73] | 111
 | 693 | 673 | 65
 | 634 | 61 | 59(| 57
 | 55 | | Tang. | |
| ŏ | 2.3 | 5.3 | 2.3 | 5.3 | 2.3
 | 5.3 | 2.3 | 3.3
 | 3.3 | 5.3 | 2.3 | 5.3
 | 2.3 | 2.3 | 8.3
 | 5.3 | 2.3 | 2.3 | 2.3
 | 2.3 | | H | ĺ |
| +0 | 24 | 60 | 20 | 32 | 34
 | 10 | 6 | 31 9
 | 33 | 10 | 80 | 31
 | 33 | 191 | 69
 | 05 | 12 | 80 | 31
 | 74 | | 60 | |
| Tang. | 79 | 83(| 86 | 899 | 935
 | 96 | 001 | 036
 | 040 | 104 | 138 | 175
 | 201 | 24] | 275
 | 310 | 34 | 378 | 41.
 | 44' | | tan | |
| - | .41 | .41 | .41 | .41 | 41
 | 41 | 42 | 42
 | 42 | 42 | 42 | 42
 | 42 | 42 | 42
 | 42 | .42 | .42 | .42
 | .42 | | Cotang. | |
| . 1 | 11 | 09 | 44 | 22 | 10
 | 92 | 74 | 26
 | 37 | 18 | 66 | 80
 | 60 | 40 | 19
 | 86 | 17 | 55 | 33
 | 11 | | | |
| Sine. | 63 | 06 | 177 | 44 | 17
 | 97 | 24 | 51
 | 78 | 05 | 31 | 58
 | 85 | 12 | 39
 | 65 | 92 | 19 | 46
 | 73 | | Cosine. | |
| ñ | 385 | 385 | 386 | 386 | 386
 | 386 | 887 | 887
 | 387 | 88 | 88 | 388
 | 888 | 389 | 389
 | 389 | 389 | 390 | 390
 | 390 | | 0° | |
| _ | - | 52 | 3 | 4 | 10
 | 6 | 200 | 00
 | 6 | 0 | 69
H | 00
 | 3 | 4 | 10
 | 9 | 7 | 00 | .16
 | 0.0 | | - | |
| - | 94 | 84 | 74 | 64 | 54
 | 44 | 34 | 24
 | 14 | 050 | 95 | 85
 | 75 | 6 5 | 55
 | 45 | 35 | 25 | 15
 | 0 6 | - | | |
| - | 3 | 3 | 33 | 33 | 3
 | 3 | ŝ | 3
 | 3 | 3 | 50 | 2
 | 50 | 50 | 3
 | 50 | 50 | 50 | 20
 | 1 2 | - | - | |
| Cosine. | 78 | 129 | 568 | 46(| 35
 | 245 | 13] | 020
 | 306 | 795 | 683 | 56
 | 45 | 33(| 22(
 | 105 | 98 | 86 | 74
 | 62 | | e. | |
| 160 | 48 | 147 | 46 | 45 | 44
 | 43 | 42 | 41
 | 39 | 38 | 37 | 36
 | 35 | 34 | 33
 | 32 | 30 | 29 | 28
 | 27 | | Sine. | |
| 2 | 6. | 36. | -92 | .92 | .92
 | .92 | .92 | .92
 | .92 | .92 | .92 | .92
 | .92 | .92 | .92
 | .92 | .92 | .92 | .92
 | -92 | | | |
| 50 | 04 | 93 | 86 | 81 | 80
 | 81 | 85 | 16
 | 10 | 13 | 28 | 46
 | 29 | 90 | 16
 | 45 | 22 | II | 49
 | 88 | | 1 | |
| tan | 322 | 301 | 18 | 61 | 41
 | 21 | 10 | 81
 | 62 | 42 | 22 | 02
 | 32 | 62 | 43
 | 23 | 03 | 84 | 64
 | 44 | | ang | |
| Cotang. | 4. | 45 | 45 | .42 | -42
 | .42 | .42 | 41
 | •41 | 41 | -41 | -41
 | •40 | .40 | •40
 | .40 | •40 | .39 | .30
 | .39 | | Tang. | |
| | 6 | 0 2 | 0 2 | 0 2 | 0 2
 | 1 | 1 23 | 2 2
 | 20 | 32 | 4 2 | 5 2
 | 6 2 | 7 2 | 8 2
 | 92 | 1 23 | 2 2 | 412
 | 50 | - | | |
| 1 ang. | 114 | 148 | 83 | 717 | 10
 | 85 | 119 | 533
 | 87 | 21 | 55 | 88
 | 23 | 57 | 16
 | 25 | 60 | 94 | 28
 | 62 | | ang | |
| 1 | 41 | 41] | 41 | 415 | 415
 | 415 | 418 | 415
 | 115 | 114 | 414 | 414
 | 115 | 415 | 115
 | 416 | 416 | 116 | 11
 | 41' | 273 | Set | |
| | 4 | 4 | 4 | 4 | 3
 | 50 | 0 | . 6
 | 1 | 4 | 50 | • 6
 | 5 | 2. | ·
00
 | 3 | . 6 | 4. | -18
 | 3 | | Cosine. Cotang. | |
| Sune. | 263 | 532 | 301 | 040 | 339
 | 308 | 377 | 145
 | 114 | 383 | 952 | 220
 | 189 | 158 |)26
 | 295 | 563 | 332 | 100
 | 369 | 1.1 | ine | |
| 2 | 80 | 80 | 808 | 810 | 818
 | 816 | 818 | 32]
 | 824 | 326 | 325 | 335
 | 334 | 837 | 340
 | 845 | 845 | 348 | 951
 | 858 | | SO | |
| | ŝ | ŝ | ÷ | ç | ŵ
 | ç | ö | ŵ
 | çõ | ŝ | ŝ | ç
 | ŝ | ñ | ŝ
 | ŝ | ŝ | çõ | ŝ
 | ŵ | | - | |
| ` | 21 | 22 | 23 | 24 | 25
 | 26 | 27 | 28
 | 29 | 30 | 31 | 32
 | 33 | 34 | 35
 | 36 | 37 | 38 | 39
 | 40 | | - | |
| | 60 | 59 | 58 | 57 | 56
 | 55 | 54 | 53
 | 52 | 51 | 50 | 49
 | 48 | 47 | 46
 | 45 | 44 | 43 | 42
 | 41 | 40 | - | |
| je. | 339 | 48 | 58 | 66 | 74
 | 80 | 86 | 92
 | 96 | 00 | 02 | 05
 | 90. | 90 | 90
 | 05 | 103 | 100 | 197
 | 93 | 888 | | |
| Cosine. | 118 | 707 | 696 | 685 | 674
 | 863 | 655 | 641
 | 530 | 320 | 506 | 598
 | 587 | 576 | 565
 | 554 | 545 | 535 | 520
 | 506 | 498 | Sine. | |
| 5 | 92 | 92 | 92 | 92 | 36
 | 92 | 92 | 92
 | 92 | 92 | 92 | 92
 | 92 | 92 | 92
 | 92 | 39 | 92 | 92
 | 92 | 92 | 02 | 1 |
| èn l | 90 | 12 | 11 | 18 | 61
 | 69 | 33 | 61
 | 98 | 110 | .90 | 34
 | 22 | 66 | 22
 | 25 | 98 | 73 | 11
 | 33 | 2 | | |
| Cotang. | 50 | 30 | 60 | 88 | 68
 | 47 | 271 | 90
 | 85 | 65 | 450 | 24
 | 049 | 83 | 63
 | 43 | 22 | 02 | 82
 | 62 | 42 | Tang. | |
| 00 | 47 | 47 | 47 | 46 | .46
 | 46 | 46 | .46
 | 45 | 45 | 45 | 45
 | 45 | 44 | 44
 | 44 | 44 | 44 | 43
 | .43 | .43 | E | Į |
| | 50 | 52 | 50 | 50 | 5
 | 30 | 20 | 5
 | 50 | 52 | 50 | 50
 | 5 | 52 | 50
 | 5 | 50 | 3 | 32
 | 30 | 50 | | |
| I ang. | 020 | 364 | 202 | 04 | 38(
 | 14 | 05' | 39
 | 73 | 20 | 41 | 75
 | 60 | 43 | LL
 | II | 450 | 191 | 12
 | 46 | 80 | Cotang. | |
| La. | 04 | 04 | 04 | 05 | 05
 | 05 | 90 | F06
 | F06 | 101 | 101 | 207
 | 108 | 08 | 08
 | 603 | 60 | 60 | 10
 | 10 | 10 | ot | - |
| | 3.4 | $\bullet 3748763 \cdot 404364 \cdot 2 \cdot 473015 \cdot 9270748 \cdot 5922 \cdot 3805324 \cdot 411489 \cdot 2 \cdot 430193 \cdot 9247676 \cdot 3842 \cdot 3859060 \cdot 418309 \cdot 2 \cdot 390576 \cdot 9225381 \cdot 38768 \cdot 38769 $ | $ \cdot 3751459 \cdot 404703 \cdot 2 \cdot 470947 \cdot 9269658 \cdot 5823 \cdot 3808014 \cdot 411830 \cdot 2 \cdot 428186 \cdot 9246568 \cdot 3743 \cdot 3861744 \cdot 418650 \cdot 2 \cdot 388625 \cdot 9224258 \cdot 38675 \cdot 922455 \cdot 9224555 \cdot 922455 \cdot 9225 \cdot 922455 \cdot 92245 \cdot 922455 \cdot 92245$ | $3754156 \cdot 405041 \\ 2 \cdot 468881 \cdot 9268566 \\ 57 \\ 24 \cdot 3810704 \cdot 412170 \\ 2 \cdot 426181 \cdot 9245460 \\ 36144 \cdot 3864427 \cdot 418992 \\ 2 \cdot 386675 \cdot 9223134 \\ 3 \cdot 864427 \cdot 418992 \\ 2 \cdot 386675 \cdot 9223134 \\ 3 \cdot 864427 \cdot 418992 \\ 3 \cdot 3864427 \cdot 418992 \\ 3 \cdot 386675 \cdot 9223134 \\ 3 \cdot 38675 \cdot 9223134 \\ 3 \cdot 386675 \cdot 9223134 \\ 3 \cdot 38675 \cdot 9225 \cdot 9223134 \\ 3 \cdot 38675 \cdot 9225 \cdot 9225 \\ 3 \cdot 38675 \cdot 9225 + 92255 \\ 3 \cdot 38675 \cdot 9225 + 92255 \\ 3 \cdot 38675 \cdot 9255 + 92255 \\ 3 \cdot 38675 + 922555 \\$ | $-3756852 \cdot 405380 \cdot 2 \cdot 466819 \cdot 9 \cdot 9 \cdot 567474 \cdot 56 \cdot 251 \cdot 3813333 \cdot 412510 \cdot 2 \cdot 4284180 \cdot 9 \cdot 244351 \cdot 35 \cdot 456 \cdot 135 \cdot 458 \cdot 1367 \cdot 110 \cdot 419334 \cdot 2 \cdot 384729 \cdot 9 \cdot 922010 \cdot 100 \cdot $ | $\circ 3759547 \cdot 405719 \cdot 2 \cdot 464759 \cdot 9 \cdot 2 \cdot 66380 \cdot 55 \cdot 2 \cdot 12851 \cdot 2 \cdot 422811 \cdot 9 \cdot 243242 \cdot 34 \cdot 146 \cdot 3869792 \cdot 419676 \cdot 2 \cdot 382785 \cdot 9 \cdot 220884 \cdot 2 \cdot 12851 \cdot$ | $3762243 \cdot 406057 \\ 2 \cdot 462703 \cdot 9265286 \\ 54 \\ 277 \cdot 3818770 \cdot 413191 \\ 2 \cdot 420185 \cdot 9242131 \\ 33 \\ 47 \\ -3872474 \cdot 420019 \\ 2 \cdot 380844 \\ -9219758 \\ -92$ | $\cdot 3764938 \cdot 406396 \left[2 \cdot 460649 \cdot 9264192 \right] 53 \left[28 \cdot 3821459 \right] \cdot 413532 \left[2 \cdot 418191 \right] \cdot 9241020 \left[32 \cdot 48 \cdot 3875156 \right] \cdot 420361 \left[2 \cdot 378906 \right] \cdot 9218632 \left[2 \cdot 37895 \right] \cdot 9218632 \left[2 \cdot 37895 \right] \cdot 9218632 \left[2 \cdot 3785 \right] \cdot 9218632 \left[3 \cdot 3785 \right] \cdot 9218632 \left[$ | $\cdot 3767632 \cdot 406735 \cdot 2458598 \cdot 9263096 \cdot 52 \cdot 29 \cdot 3824147 \cdot 413872 \cdot 2416201 \cdot 9239908 \cdot 31449 \cdot 3877837 \cdot 420703 \cdot 2927594 \cdot 2017504 \cdot 2017504$ | 7 .4 | 1 .4 | $\cdot 3775714 \cdot 407753 \cdot 252246 \cdot 9259805 \cdot 4932 \cdot 3832209 \cdot 414895 \cdot 2410246 \cdot 9236567 \cdot 2852 \cdot 3885880 \cdot 421731 \cdot 297371 \cdot 79 \cdot 9214116 \cdot 92145 \cdot 92155 \cdot 92145 \cdot 92155 \cdot 9215$ | 8.4 | 1.4 | $\cdot 3783794 \cdot 408771 \\ 2 \cdot 446355 \cdot 9256506 \cdot 46355 \cdot 3840268 \cdot 415918 \\ 2 \cdot 404316 \cdot 9233220 \\ 255 \cdot 3893919 \cdot 422759 \\ 2 \cdot 3656411 \cdot 9270728 \\ 2 \cdot 36564 \cdot 1000728 \\ 2 \cdot 36564 + 1000728 \\ 2 \cdot 3656 $ | $-3786486 \cdot 409110 \\ 2 \cdot 444325 \cdot 9255405 \\ 45 \\ 36 \cdot 834295 \\ -416259 \\ 2 \cdot 416259 \\ 2 \cdot 402345 \\ -9232102 \\ 2 \cdot 456 \\ -9232102 \\ 2 \cdot 456 \\ -8296 \\ -826 \\$ | $\cdot 3789178 \cdot 409450 \\ 2 \cdot 42298 \cdot 9254303 \\ 4 \cdot 437 \cdot 3845639 \cdot 416601 \\ 2 \cdot 400377 \cdot 9230984 \\ 2330984 \\ 2367 \cdot 3899277 \cdot 423445 \\ 2 \cdot 361580 \cdot 9208455 \\ 2 \cdot 361580 \\ 2 \cdot 3$ | $\cdot 3791870 \cdot 409790 \cdot 2440273 \cdot 9253201 \cdot 4338 \cdot 3848324 \cdot 416942 \cdot 2\cdot 398411 \cdot 9229865 \cdot 2268 \cdot 3901955 \cdot 423788 \cdot 2\cdot 359668 \cdot 9207320 \cdot 3207320 \cdot 3201955 \cdot 423788 \cdot 2\cdot 359668 \cdot 9207320 \cdot 3207320 \cdot 3207220 \cdot 320720 \cdot 320720 \cdot 3207220 \cdot 3207220 \cdot 320720 \cdot 32072000 \cdot 320720 \cdot 320720 \cdot 320720 \cdot 320720 \cdot 3207200 \cdot 3207200 \cdot 320720$ | $\cdot 3794562 \cdot 410129 \cdot 2\cdot 438251 \cdot 9252097 \cdot 42339 \cdot 3851008 \cdot 417284 \cdot 2\cdot 396449 \cdot 9228745 \cdot 2159 \cdot 3904633 \cdot 4\cdot 24131 \cdot 2\cdot 357759 \cdot 9206185 \cdot 2006185 \cdot 20$ | 3 .4 | 4 | | |
| e | 06 | 76 | 459 | 150 | 85
 | 54 | 24 | 93
 | 63 | 32 | 02 | 11
 | 40 | 10 | 29
 | 48 | 17 | 148 | 56
 | 25 | 94 | Cosine. | |
| Sine. | 46 | 48 | 12 | 54 | 56
 | 59 | 62 | 764
 | 767 | 770 | 173 | 775
 | 178 | 181 | 83
 | 186 | 189 | 16/ | 794
 | 197 | 664 | osi | |
| - | .37 | .37 | | | | | | | | $9^{ 3770327 407074} \\ 2456551 \\ \cdot 9262000 \\ 51^{ 30 } \\ \cdot 3826334 \\ \cdot 414213 \\ \cdot 2414213 \\ \cdot 2414213 \\ \cdot 9238795 \\ \cdot 9050 \\ \cdot 92880518 \\ \cdot 421046 \\ \cdot 2375037 \\ \cdot 9216375 \\ $ | $10\cdot 3773021\cdot 407413 \\ 2\cdot 454566 \cdot 9260902 \\ 5031\cdot 3829522 \cdot 414554 \\ 2\cdot 412528 \cdot 9237682 \\ 2921682 \\ 292168 \\$ | .37 | $12^{\circ}3778408^{\circ}408092^{\circ}2^{\circ}450425^{\circ}9258706^{\circ}48^{\circ}33^{\circ}3834895^{\circ}415236^{\circ}2^{\circ}408267^{\circ}9235452^{\circ}27^{\circ}53^{\circ}3885660^{\circ}422073^{\circ}2^{\circ}369254^{\circ}9212986^{\circ}60^{\circ}636^{$ | $13 \cdot 3781101 \cdot 408431 \cdot 248389 \cdot 9257606 \cdot 4734 \cdot 3837582 \cdot 415577 \cdot 2406290 \cdot 9234336 \cdot 26 \cdot 3891240 \cdot 422416 \cdot 2267331 \cdot 9211854 \cdot 128331 \cdot 3281284 \cdot 328333 \cdot 3283333 \cdot 328333 \cdot 3283333 \cdot 328333 \cdot 328333 \cdot 328333 \cdot 328333 \cdot 3283333 \cdot 3283333 \cdot 3283333 \cdot 3283333 \cdot 328333 \cdot 3283333 \cdot 3283333 \cdot 3283333 \cdot 328333 \cdot 328333 \cdot 328333 \cdot 3283333 \cdot 328333 \cdot 3283333 \cdot 3283333 \cdot 32833333 \cdot 32833333 \cdot 328333333 \cdot 328333333 \cdot 328333333 \cdot 32833333 \cdot 32833333 \cdot 32833333 \cdot 32833333333 \cdot 32833333 \cdot 328333333 \cdot 3283333333333$ | .37 | .3 | .37 | .3. | .8. | $ - 3797253 + 410469 \\ 2 \cdot 436233 \\ - 9250993 \\ 41 \\ 40 \cdot 3553693 \\ + 417625 \\ - 37394488 \\ - 9227624 \\ - 2060 \\ - 3907311 \\ - 424474 \\ - 2355852 \\ - 9205049 \\ -$ | 20 37999944 410809 2434217 9249888 40 | 0 | |
| . | 0 | 1 | 65 | 3 | 4
 | 5 | 9 | 2
 | œ | 6 | 10 | II
 | 12 | 13 | 14
 | 15 | 16 | 17 | 18
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23 Deg.

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<u> </u>	
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23 Deg.

| 1 | 19 | 18 | 17 | 16
 | 15 | 14 | 13 | 12 | 11
 | 10 | 6 | 00
 | 2 | 9 | 5
 | 4 | 3 | \$ | 1 | 0
 | | ~ | 66. |
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Cosine.	6127795	9156626	9155456
 | 9153115 | 9151943 | 0270619 | 9149597 | 9148422
 | 9147247 | 9146072 | 9144895
 | 9143718 | 9142540 | 9141361
 | 9140181 | 9139001 | 9137819 | 9136637 | 9135455
 | 040 | Sine. | Deg. 66. |
| Tang. Cotang. Cosine. | 2.279865 | 2-278063 | 2.276264 | 2.274467
 | 2.272672 | 2-270880 | 2.269090 | 2.267303 | 2.265518
 | 2.263735 | 2-261955 | 2-260177
 | 2-258401 | 2.256628 | 2.254857
 | 2-253088 | 2.251322 | 2-249558 | 2.247796 | 2.246036
 | | Tang. | |
| Tang. | -438622 | ·438969 | •439316 | ·439663
 | ·440010 | •440357 | •440705 | •441052 | •441400
 | •441747 | .442095 | •442443
 | 412791 | 443139 | •413487
 | .443835 | 444183 | .444531 | •444880 | .445228
 | | Cotang. | |
| Sine. | .4016814 | -4019478 | ·4022141 | ·4024804
 | ·4027467 | 4030129 | 4032791 | 4035453 | ·4038714
 | 4040775 | 4043436 | -4046096
 | 4048756 | 4051416 | ·4054075
 | ·4056734 | -4059393 | .4062051 | ·4064709 | -4067366
 | | / / Cosine. Cotang. | |
| , , , | 39 41 | 3842 | 3743 | 36 44
 | 35 45 | 34 46 | 33 47 | 32 48 | 3149
 | 30 50 | 2951 | 2852
 | 27 53 | 26 54 | 25 55
 | 24 56 | 23 57 | 22 58 | 21 59 | 20 60
 | | | 6. |
| Cosine. | 9181009 | 9179855 | .9178701 | .9177546
 | 19176391 | .9175234 | 9174077 | 9172919 | -9171760
 | 1090719 | -9169440 | 9168279
 | .9167118 | 9165955 | 9164791
 | 9163627 | 9162462 | 9161297 | .9160130 | .9158963
 | | Sine. | Deg. 66. |
| Tang. Cotang. Cosine. / / | 2.316407 | 2.314557 | 312709 | 2.310863
 | 2.309020 | 081206.3 | 2.305342 | 2.303506 | 2.301673
 | 2.299842 | 2.298014 | 2.296188
 | 2.294365 | 2.292544 | 2.290725
 | 2.288909 | 2.287095 | 2.285284 | 2.283475 | 2.281669
 | | Tang. | |
| Tang. | 431703 | ·432048 | ·432393 | •432738
 | .433084 | .433429 | ·433775 | .434120 | 434466
 | ·434812 | 435158 | 435504
 | 435850 | ·436196 | 436542
 | 436889 | .437235 | ·437582 | ·437928 | ·438275
 | and a | Cotang. | |
| Sine. | 3963468 | 3966139 | 3968809 | 3971479
 | 3974148 | -3976818 | -3979486 | 3982155 | •3984823
 | .3987491 | 3990158 | 3992825
 | .3995492 | 3998158 | 4000825
 | .4003490 | 4006156 | 4008821 | -4011486 | 4014150
 | | / / Cosine. Cotang. | |
| | 21 | 922 | 323 | 7 24
 | 325 | 526 | 127 | 328 | 2 29
 | 130 | 31 | 32
 | 333 | 734 | 335
 | 536 | 137 | 338 | 2 39 | 140
 | _ | - | |
| Tang. Cotang. Cosine. / / | $0.3907311 \\ -424474.2, 3555852 \\ -9205049 \\ 6021 \\ -3963468 \\ -431703 \\ 2, 316407 \\ -9181009 \\ -9181009 \\ -99411 \\ -4016814 \\ -438622 \\ -2, 279865 \\ -9157795 \\ 19 \\ -1016814 \\ -438622 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438622 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438622 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438622 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438622 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438652 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438652 \\ -2, 279865 \\ -9157795 \\ -1016814 \\ -438652 \\ -2, 279865 \\ -2, 27986$ | $ \cdot 3909989 \cdot 424818 \cdot 2353948 \cdot 9203912 \cdot 5926139 \cdot 432048 \cdot 314557 \cdot 9179855 \cdot 3842 \cdot 4019478 \cdot 438969 \cdot 278063 \cdot 9156626 \cdot 18873 \cdot 9179855 \cdot 9$ | $\circ 3912666 \bullet 425161 \circ 352046 \cdot 9202774 \circ 5823 \cdot 3968809 \cdot 432333 \circ 312709 \cdot 9178701 \circ 3743 \cdot 4022141 \cdot 439316 \circ 2\cdot 276264 \cdot 91554561 \circ 312769 \cdot 91757561 \circ 312769 \cdot 91757561 \circ 312769 \cdot 91757561 \circ 312769 \circ 312769 \cdot 91757561 \circ 312769 \circ 312$ | $\cdot 3915343 \cdot 425505 \\ 2 \cdot 350148 \cdot 9201635 \\ 574467 \cdot 9971479 \cdot 432738 \\ 2 \cdot 310863 \cdot 9177546 \\ 36144 \cdot 4024804 \cdot 439663 \\ 2 \cdot 274467 \cdot 9154286 \\ 160 \cdot 100 \\ 2 \cdot 274467 \cdot 9154286 \\ 160 \cdot 100 \\ 2 \cdot 274467 \cdot 9154286 \\ 2 \cdot 210863 \cdot 9177546 \\ 3 \cdot 210863 \cdot 917754 \\ 3 \cdot 210863 \cdot 91754 \\ 3 \cdot 210863 + 91754 \\ 3 \cdot 210863 +$ | $\cdot 3918019 \cdot 425848 \\ 2 \cdot 348251 \cdot 9200496 \\ 56 \\ 56 \cdot 9974148 \cdot 433084 \\ 2 \cdot 3309020 \cdot 9176391 \\ 35 \\ 45 \cdot 4027467 \cdot 440010 \\ 2 \cdot 272672 \cdot 9153115 \\ 15 \cdot 15 \cdot 15 \cdot 15 \\ 2 \cdot 15 \cdot $ | $3920695 \cdot 426192 \cdot 346358 \cdot 9199356 \cdot 5526 \cdot 3976818 \cdot 433429 \cdot 307180 \cdot 9175234 \cdot 34446 \cdot 4030129 \cdot 440357 \cdot 2270880 \cdot 9151943 \cdot 142353 \cdot 227080 \cdot 9151943 \cdot 227080 \cdot 9151942 \cdot 227080 \cdot 9151942 \cdot 227080 \cdot 915192 \cdot 227080 \cdot 227080 \cdot 915192 \cdot 227080 \cdot 22708$ | $\cdot 3923371 \cdot 426536 \\ 2 \cdot 34467 \cdot 9198215 \\ 5427 \cdot 3979486 \cdot 433775 \\ 2 \cdot 305342 \cdot 9174077 \\ 3 \\ 3 \\ 4 \\ 1 \\ 7 \cdot 4032791 \cdot 440705 \\ 2 \cdot 269090 \cdot 9150770 \\ 1 \\ 3 \\ 1 \\ 1 \\ 2 \cdot 269090 \cdot 9150770 \\ 1 \\ 3 \\ 1 \\ 1 \\ 2 \cdot 269090 \cdot 9150770 \\ 1 \\ 3 \cdot 26900 \cdot 915070 \\ 1 \\ 3 \cdot 26900 - 9150770 \\ 1 \\ 3 \cdot 26900 - 915070 \\ 1 \\ 3 \cdot 26900 - 91500 \\ 1 \\ 3 \cdot 26900 - 915000 \\ 1 \\ 3 \cdot 26900 - 91500 \\ 1 \\ 3 \cdot 26900 - 91500 \\ 1$ | $\cdot 3926647 \cdot 426880 \left[2 \cdot 34278 \cdot 9197073 \right] 53 \frac{1}{28} \cdot 3982155 \cdot 434120 \left[2 \cdot 303506 \right] \cdot 9172919 \left[3248 \right] \cdot 4035453 \cdot 441052 \left[2 \cdot 267303 \right] \cdot 9149597 \left[12 \cdot 267303 \right] \cdot 914977 \left[12 \cdot 267303 \right] \cdot 91777 \left[12 \cdot 267303 \right] \cdot 917777 \left[12 \cdot 267303 \right] \cdot 9177777 \left[12 \cdot 267303 \right] \cdot 9177777777777777777777777777777777777$ | $\cdot 3928722 \cdot 427223 \cdot 2\cdot 340692 \cdot 9195931 \\ \cdot 5229 \cdot 3984823 \cdot 434466 \\ \cdot 301673 \cdot 917176 \\ \cdot 3149 \cdot 4038114 \cdot 441400 \\ \cdot 2\cdot 55518 \cdot 9148422 \\ \cdot 301673 \cdot 917176 \\ \cdot 31673 \cdot 91723 \\ \cdot 31673 - 91723 \\ \cdot 31723 - 91723 \\ \cdot 317$ | $9^{-3931397} + 27568 \\ 2\cdot 338809 + 9194788 \\ 51 \\ 50 \\ \cdot 3987491 + 434812 \\ \cdot 2\cdot 299842 \\ \cdot 9170601 \\ \\ 30 \\ 50 \\ \cdot 4040775 \\ \cdot 441747 \\ 2\cdot 263735 \\ \cdot 914775 \\ \cdot 41747 \\ 12\cdot 263735 \\ \cdot 914775 \\ \cdot 12575 \\ $ | $0.3934071 \\ -427912 \\ 2\cdot336928 \\ \cdot 9193644 \\ 50 \\ 31 \\ \cdot 3990158 \\ \cdot 435158 \\ 2\cdot298014 \\ \cdot 9169440 \\ 29 \\ 1 \\ \cdot 9169440 \\ 29 \\ 1 \\ \cdot 42035 \\ \cdot 442095 \\ 2\cdot261955 \\ \cdot 9146072 \\ \cdot 914072 \\ \cdot 9140$ | $1^{-3}336745^{-4}28256^{-3}35050^{-9}192499^{-49}32^{-3}3992825^{-4}35504^{-2}2\cdot296188^{-9}168279^{-28}52^{-4}046096^{-4}42443^{-2}2\cdot260177^{-9}144895^{-1}2\cdot296187^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot261777^{-1}2\cdot2617777^{-1}2\cdot2617777^{-1}2\cdot261777777^{-1}2\cdot26177777777777777777777777777777777777$ | $\cdot 3339419 \cdot 428600 \cdot 2 \cdot 333174 \cdot 9191353 \cdot 48 \\ 33 \cdot 3995492 \cdot 435850 \cdot 2 \cdot 294365 \cdot 9167118 \cdot 2753 \cdot 4048756 \cdot 412791 \cdot 2258401 \cdot 9143718 \cdot 2258401 \cdot 914718 \cdot 22584001 \cdot 914718 \cdot 2258401 \cdot 914718 \cdot 22584001 \cdot 914718 \cdot 22584001 \cdot 9147$ | $3^{-3942093} + 428944 \\ 2 \cdot 331301 \cdot 9190207 \\ 4734 \cdot 3998158 \cdot 436196 \\ 2 \cdot 292544 \cdot 916595 \\ 2654 \\ 2 \cdot 916595 \\ 2655 \\ 2 \cdot 6124 \\ 2 \cdot 61216 \\ 2 \cdot 61216 \\ 2 \cdot 61216 \\ 2 \cdot 61216 \\ 2 \cdot 6125 \\ 2 \cdot $ | $\textbf{4} \bullet \textbf{3944766} \bullet \textbf{4292899} \circ \textbf{329431} \bullet \textbf{9189060} \bullet \textbf{46} \textbf{35} \bullet \textbf{4000825} \bullet \textbf{436542} \circ \textbf{230725} \bullet \textbf{9164791} \circ \textbf{25} \textbf{55} \bullet \textbf{4054075} \bullet \textbf{493487} \circ \textbf{2254857} \bullet \textbf{9141361} \bullet \textbf{3914766} \bullet \textbf{493437} \circ \textbf{3914366} \bullet \textbf{3914766} \bullet \textbf{391476} \bullet \textbf{391476} \bullet \textbf{3914766} \bullet \textbf{391476} \bullet \textbf{391476} \bullet \textbf{3914766} \bullet \textbf{391476} \bullet 39$ | $5 \cdot 3947439 \cdot 429633 \cdot 327563 \cdot 9187912 \cdot 45336 \cdot 4003490 \cdot 436889 \cdot 288999 \cdot 9163627 \cdot 2456 \cdot 4056734 \cdot 443835 \cdot \mathbf{2\cdot253088} \cdot 9140181 \cdot 128767 \cdot 12$ | $6 \cdot 3950111 \cdot 429978 \cdot 2 \cdot 325697 \cdot 9186763 \cdot 44.37 \cdot 4006156 \cdot 437235 \cdot 2 \cdot 87095 \cdot 9162462 \cdot 2357 \cdot 4059393 \cdot 444183 \cdot 2 \cdot 251322 \cdot 9139001 \cdot 91392 \cdot 91392 \cdot 9139001 \cdot 91392 \cdot 913$ | $7^{+}3952783^{+}430323^{+}233334^{+}9185614^{+}338^{+}4008821^{+}437582^{+}235284^{+}9161297^{+}2258^{+}44621^{+}444531^{+}2249558^{+}9137819^{+}2249558^{+}61297^{+}2266261^{+}444531^{+}2249558^{+}9137819^{+}2266261^{+}6666661^{+}666261^{+}666666666666666666666666666666666666$ | $8^{[-3355455]} \cdot 430668 \\ [-321974] \cdot 9184464 \\ \cdot 4239 \\ \cdot 4011486 \\ \cdot 437928 \\ [-323475] \cdot 9160130 \\ [-3159] \cdot 4064709 \\ \cdot 44488 \\ 0 \\ \cdot 247796 \\ \cdot 9136637 \\ \cdot 9136637 \\ \cdot 91260 \\ \cdot 9$ | $0^{-3958127} \cdot 431012^{-32} \cdot 320116 \cdot 9183313 \cdot 41140 \cdot 4014150 \cdot 438275 \cdot 281669 \cdot 9158963 \cdot 2060 \cdot 4007366 \cdot 445228 \cdot 2246036 \cdot 9135455 \cdot 236056 \cdot 445228 \cdot 2246036 \cdot 9135455 \cdot 2246036 \cdot 913555 \cdot 2246036 \cdot 2246036 \cdot 913555 \cdot 9135555 \cdot 9135555 \cdot 9135555 \cdot 9135555 \cdot 9135555 \cdot 9135555 \cdot 91355555 \cdot 913555555 \cdot 91355555 \cdot 91355555 \cdot 913555555555555 \cdot 913555555555555555555555555555555555555$ | $20 \cdot 3960798 \cdot 431357 \cdot 2 \cdot 318260 \cdot 9182161 \cdot 40$ | Sine. | Deg. 66. |
| Cotang. | 2.355852 | 2.353948 | 2.352046 | 2.350148
 | 2.348251 | 2.346358 | 2.344467 | 2.342578 | 2.340692
 | 2.338809 | 2.336928 | 2-335050
 | 2.333174 | 2-331301 | 2.329431
 | 2.327563 | 2.325697 | 2.323834 | 2.321974 | 2.320116
 | 2.318260 | Tang. | |
| Tang. | ·424474 | ·424818 | ·425161 | ·425505
 | ·425848 | .426192 | .426536 | .426880 | .427223
 | .427568 | .427912 | .428256
 | .428600 | .428944 | .429289
 | .429633 | .429978 | ·430323 | -430668 | .431012
 | ·431357 | Cosine. Cotang. | |
| Sine. | .3907311 | •3909989 | ·3912666 | .3915343
 | .3918019 | 3920695 | .3923371 | ·3926047 | ·3928722
 | ·3931397 | ·3934071 | ·3936745
 | ·3939419 | •3942093 | ·3944766
 | ·3947439 | 1110268. | .3952783 | ·3955455 | .3958127
 | •3960798 | Cosine. | |
| • 2 | 0 | 1 | 65 | 3
 | 4 | 5 | 9 | 2 | 00
 | 6 | 10 | 11
 | 12 | 13 | 14
 | 15 | 16 | 17 | 18 | 19
 | 20 | ~ | |

24 Deg.

24 Deg.

24 Deg.

- 1	19	18	17	16	15	14	13	12	11	10	6	00	2	9	5	4	3	63		0		-	1.0
Cosine.	$0.4067366 \cdot 445228 \cdot 2246036 \cdot 9135455 \cdot 60 \cdot 21 \cdot 4123096 \cdot 452568 \cdot 2\cdot 209611 \cdot 9110438 \cdot 3941 \cdot 4176028 \cdot 459596 \cdot 2\cdot 175822 \cdot 9986297 \cdot 1986297 \cdot 1986236 \cdot 198626 \cdot 1986236 \cdot 1186236 \cdot 1986236 \cdot 198626 \cdot 1986626 \cdot 1986626 \cdot 198666 \cdot 1986666 \cdot 1986666666 \cdot 198666666666666 \cdot 19866666 \cdot 198666666666666666666666666666666666666$	$-4070024 + 445577 \\ 2 \cdot 2 \cdot 44279 + 9134271 \\ 5 \cdot 922 + 4125745 \\ + 452918 \\ 2 \cdot 207901 \\ + 9109238 \\ \\ 3 \cdot 8 \\ + 2 \cdot 4178671 \\ + 459948 \\ \\ 2 \cdot 174155 + 9085082 \\ + 188 \\ + 2 \cdot 4178671 \\ + 459948 \\ \\ 2 \cdot 174155 \\ + 9085082 \\ + 188 \\ + 2 \cdot 4178671 \\ + 459948 \\ + 2 \cdot 41255 \\ + 9085082 \\ + 188 \\ + 2 \cdot 41285 \\ + 188 \\ + 2 \cdot 41285 \\ + 188 \\ + 2 \cdot 4128 \\ + 188$	$-4072681 + 445926 + 2\cdot242524 + 9133087 + 5823 + 4128395 + 453269 + 2\cdot266193 + 9108038 + 3743 + 4181313 + 460301 + 2\cdot172491 + 9083866 + 1752451 + 12524 + 125$	$3^{+}4075337^{+}446274^{+}2\cdot 240772^{+}9131902^{+}57^{+}24^{+}4131044^{+}453620^{+}2\cdot 204487^{+}9106837^{+}36^{+}44^{+}418356^{+}460653^{+}2\cdot 170828^{+}9082649^{+}16^$	$-4077993 + 446623 \\ 2 \cdot 239021 + 9130716 \\ 56 \\ 26 \\ 138693 \\ 453970 \\ 2 \cdot 202784 \\ + 9105635 \\ 35 \\ 45 \\ + 1451006 \\ 2 \cdot 161006 \\ 2 \cdot 169106 \\ + 9081432 \\ + 15 \\ + 126106 \\ + 126006 \\ $	$-4080649 \cdot 416972 \cdot 2 \cdot 237273 \cdot 9129529 \cdot 5526 \cdot 4136342 \cdot 454321 \cdot 2 \cdot 201083 \cdot 9104432 \cdot 3446 \cdot 4189239 \cdot 461359 \cdot 2 \cdot 167509 \cdot 9080214 \cdot 148233 \cdot 16823 $	$-4083305 \cdot 447321 \cdot 235528 \cdot 9128342 \cdot 54572 \cdot 4138990 \cdot 454672 \cdot 5199384 \cdot 9103228 \cdot 3347 \cdot 4191880 \cdot 461711 \cdot 2\cdot165852 \cdot 9078995 \cdot 13890 \cdot 461711 \cdot 2\cdot165852 \cdot 9078995 \cdot 13890 \cdot 461711 \cdot 2\cdot165852 \cdot 9078995 \cdot 13890 \cdot 461711 \cdot 2\cdot16585 \cdot 9078995 \cdot 138995 \cdot 13895 \cdot 138995 \cdot 13895 \cdot 1$	6777700.	·9076554	$9 \cdot 4091269 \cdot 448369 \cdot 230304 \cdot 9124775 51 \cdot 30 \cdot 4146932 \cdot 455726 \cdot 2 \cdot 194299 \cdot 9099613 \cdot 30 \cdot 50 \cdot 4199801 \cdot 462771 \cdot 2 \cdot 166895 \cdot 9075333 \cdot 40000 \cdot 2 \cdot 10000 \cdot 10000 \cdot 10000 \cdot 10000 \cdot 10000 \cdot 100000 \cdot 100000 \cdot 10000 \cdot 100000 \cdot 1$.9074111	9072888	0071665	9070140	9069215	6862906.	-9066762	9065535	9064307	82.02906.	-	Sine.	Deg. 65.
Cotang.	2.175822	2.174155	2.172491	2.170828	2.169167	2.167509	2.165852	$-4085960 \cdot 447670 \cdot 233784 \cdot 9127154 \cdot 5328 \cdot 4141638 \cdot 455023^{\circ} \cdot 2197687 \cdot 9102024 \cdot 3248 \cdot 4194521 \cdot 462064 \cdot 2 \cdot 164198 \cdot 9077775 \cdot 100000000000000000000000000000000000$	$8 \cdot 4088615 \cdot 448020 \cdot 2 \cdot 232043 \cdot 9125965 \cdot 5229 \cdot 414285 \cdot 455375 \cdot 2195992 \cdot 9100819 \cdot 3149 \cdot 4197161 \cdot 462417 \cdot 2 \cdot 162546 \cdot 9076554 \cdot 9076554 \cdot 100819 \cdot 100819 \cdot 100861 \cdot 1008$	2.160895	$0.4093923 \\ +448718 \\ 2.228567 \\ -9123584 \\ 5031 \\ +4149579 \\ -4149579 \\ -4195607 \\ \\ 2.192609 \\ -9098406 \\ \\ 2951 \\ -4202441 \\ -463124 \\ \\ 2.159247 \\ -907411 \\ -907411 \\ -907411 \\ -90741 \\ -90747 \\ -907411 \\ -90747 \\$	(11,4096577,449068)	$ [z] - 4099230 \\ - 449417 \\ [z] - 225100 \\ - 9121201 \\ - 9133 \\ - 4154872 \\ - 456780 \\ [z] - 4903549 \\ - 9095990 \\ - 2753 \\ - 4207719 \\ - 463831 \\ - 2755957 \\ - 9071665 \\ - 907065 \\ $	$13^{-4101883} - 449767^{-2} \cdot 223370^{-9120008} 47 \\ 34^{-41} 57517^{-457132} 2^{-187551} - 9094781 26 \\ 54^{-42} 10358^{-464184} 2^{-154315} - 9070140^{-45116} 2^{-164184} 2^{-16418$	$14 \\ 4104536 \\ 450117 \\ 2 \\ 2 \\ 2 \\ 2 \\ 16433 \\ 9 \\ 9 \\ 16856 \\ 4 \\ 160163 \\ 4 \\ 5 \\ 7 \\ 1888 \\ 2 \\ 18586 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ 9 \\ $	15 - 4107189 - 450467 - 2219917 - 9117620 + 45636 - 4162808 - 457835 - 184189 - 9092361 - 2456 - 4215634 - 464891 - 2151037 - 9067989 - 9092361 - 2456 - 4215634 - 464891 - 2151037 - 9067989 - 9092361 - 2456 - 2	$ \begin{array}{c} \mathbf{(6)} 4109841 \\ 450817 \\ 2 \cdot 218194 \\ 99116425 \\ 4437 \\ 4187455 \\ 3757 \\ 4165453 \\ 3757$	$[7] 4112492 \\ 451167 \\ 2\cdot 216473 \\ 9115229 \\ 421689 \\ 3\cdot 168097 \\ 458539 \\ 2\cdot 180836 \\ 90836 \\ 908938 \\ 8\cdot 258 \\ 4220909 \\ 452599 \\ 2\cdot 147768 \\ 9065535 \\ 2\cdot 180836 \\ 90836 $	$18^{-41} 15144^{-45} 1517^{-2} 214754^{-9} 114033^{-41} 70741^{-45} 8991^{-2} 179163^{-9} 088725^{-2} 21^{-5} 89^{-4} 223546^{-4} 65953^{-2} 2146136^{-9} 664307^{-1} 89^{-2$	$19^{-4117795} \cdot 451867 \cdot 213037 \cdot 9112835 \cdot 4140 \cdot 4173355 \cdot 459243 \cdot 2\cdot177492 \cdot 9087511 \cdot 2060 \cdot 4226183 \cdot 466307 \cdot 2\cdot144506 \cdot 9063078 \cdot 2\cdot17455 \cdot 2\cdot127492 \cdot 2\cdot12$		Tang.	
Tang.	.459596	.459948	460301	460653	$\cdot 461006$.461359	.461711	·462064	·462417	•462771	•463124	463477	•463831	•464184	.464538	.464891	.465245	.465599	.465953	.466307		Cotang.	
Sine.	4176028	4178671	4181313	4183956	4186597	4189239	4191880	4194521	4197161	4199801	4202441	4205080	4207719	4210358	4212966	4215634	4218272	4220909	4223546	4226183		/ / Cosine. Cotang.	
-	41	42	43	44	45	46	47	48	49	00	51	52	53	54	55	56	57	58	69	09		~	4
• 1	3 39	38 38	3 37	7 36	5 35	2 34	8 33	1 39	9 31	330	3 29	9 28	0 27	1 26	2,25	1 24	123	8 22	5 21	1 20		-	65.
Cosine.	·9110438	·9109238	·9108038	•910683	-910563	·910443	-9103228	-9102024	.910081	:196606.	·909840	612606.	•909599(-909478	.9093575	•9092361	·909115(.9089938	.908872	.908751		Sine.	Deg. 65.
Tang. Cotang.	2-209611	2-207901	2.206193	2.204487	2.202784	2-201083	2.199384	2.197687	2.195992	2.194299	2.192609	2.190921	2.189234	2-187551	2.185869	2.184189	2-182511	2.180836	2-179163	2.177492		Tang.	
Tang.	452568	.452918	.453269	.453620	.453970	.454321	.454672	.455023	.455375	.455726	-456077	.456429	456780	457132	457483	457835	458187	458539	458891	.459243	N N	Cotang.	
Sine.	4123096	4125745	4128395	4131044	4133693	4136342	4138990	4141638	4144285	4146932	4149579	4152226	4154872	4157517	4160163	4162808	4165453	4168097	4170741	4173385		/ / Cosine. Cotang.	- j
- 1	21.	22	23	24.	25.	26.	27.	28.	29	30.	31.	32.	33	34	35.	36	371.	38	391	40		~	
- 1	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	~	
Cosine.	.9135455	·9134271	·9133087	·9131902	·9130716	·9129529	.9128342	·9127154	.9125965	·9124775	·9123584	.9122393	.9121201	-9120008	.91188115	.9117620	.9116425	-9115229	-9114033	.9112835	·9111637	Sine.	Deg. 65.
Cotang.	2.246036	2-244279	2.242524	2.240772	2.239021	2.237273	2.235528	2.233784	2.232043	2.230304	2.228567	2.226833	2.225100	2-223370	2-221643	2.219917	2.218194	2.216473	2.214754	7.213037	20 4120445 452217 2.211323 9111637 40	Tang.	
Tang.	.445228	-445577	.445926	.446274	.446623	.446972	.447321	.447670	.448020	.448369	.448718	.449068	449417	449767	.450117	·450467	.450817	451167	451517	.451867	.452217	Cotang.	
Sine.	1067366	4070024	4072681	4075337	4077993	4080649	4083305	4085960	4088615	4091269	-4093923	4096577	4099230	4101883	4104536	4107189	4109841	4112492	4115144	4117795	4120445	/ Cosine.	

25 Deg.

25 Deg.

25 Deg.

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-	1	LII	0.10	10	1 1	1.0	1 -	100			4 16		2	0	8	1	5 4	~	6	5	0	,		64.
Cosine.		-901203	770109.	900950	100000		143000.	110006.	912000	-900192	-900065	866668.	118668.	-899684	16399557	899430	899303	921668-	899048	898921	898794		Sine,	Deg. 6
Tang. Cotang.		2.079394	2.077846	2-076300	2.074756	V16640.6	PLACIU.4	2.070135	2.068599	2.067064	2-065531	2-064000	2-062471	2.060944	2.059418	2.057895	2.056373	2.054853	2.053334	2-0518181	2-050303		Tang.	
Tang.		606084.	-481267	.481625	481984	678687.	102681.	-483060	.483418	.483777	.484136	.484495	.484855	.485214	.485573	485933	486293	486652	-487012	·487372	.487732		Cotang.	
Sine.		0285554.0	-4336591	.4339212	.4341832	4344453	6404V87.	4349692	.4352311	.4354930	·4357548	·4360166	.4362784	.4365401	·4368018	•4370634	4373251	4375866	.4378482	4381097	4383711		/ / Cosine. Cotang.	
-	1:	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	_	1	
_		62	38	37	36	35	24	333	32	31	30	29	28	27	26	25	24	23	22	21	20		~	
Cosine.	0000000	SEU/208.	·9035847	·9034600	.9033353	-9032105	903080856	-9029606	.9028356	.9027105	.9025853	.9024600	.9023347	.9022092	.9020838	·9019582	·9018325	·9017068	.9015810	.9014551	.9013292		Sine.	Deg. 64.
Tang. Cotang. Cosine.	MI MOLLO	10[1202106] 16202006. 000251. 020225. 1402. 020225. 120215. 021225. 120225. 020225	$-4228819 + 466661 \\ 2 \cdot 142879 + 9061848 \\ 5922 + 4284995 + 474122 \\ 2 \cdot 109161 + 9035847 \\ 3842 + 3842 \\ -481267 \\ 2 \cdot 077846 + 901 \\ 0 \cdot 77846 + 901 \\ 0 \cdot 7846 + 900 \\ $	$-4231455 \cdot 467016 \cdot 2 \cdot 141253 \cdot 9060618 \cdot 5823 \cdot 47478 \cdot 107577 \cdot 9034600 \cdot 3743 \cdot 4339212 \cdot 481625 \cdot 2 \cdot 076300 \cdot 9009508 \cdot 178300 \cdot 1000508 \cdot 1281655 \cdot 2 \cdot 076300 \cdot 9009508 \cdot 1281655 \cdot 2 \cdot 076300 \cdot 9009508 \cdot 1281655 \cdot 2 \cdot 076300 \cdot 2 \cdot 07600 \cdot 2 \cdot 07600 \cdot 2 \cdot 076300 \cdot 2 \cdot 07600 \cdot 2 \cdot 07600$	423 1090 467370 2 ·139630 9 059386 5724 42 89351 4 74834 2 ·105995 9 033353 3 644 4 :241832 4 :27256 6 000506 1	4236725 467725 2:138008 9058154 56 25 4291979 475191 2:1041 5:9032105 2545 4:89349 2:00000 h 100000 h	42333601 468779 2.133589 40156922 55 26 4294606 475548 2.102536 4000000 2010 2010 2010 2010 2010 2010 2	6 4241994 468434 2:134771 :9055688 54 27 4292733 475904 2:10260 : 9029666 3347 +3245692 +83060 : 070145 1 4	$+4244628 \cdot 468789 \cdot 2 \cdot 133155 \cdot 9054454 \cdot 5328 \cdot 476261 \cdot 2 \cdot 999686 \cdot 9028356 \cdot 3248 \cdot 4352311 \cdot 4834 \cdot 182 \cdot 685599 \cdot 6003188 \cdot 1203183 \cdot 1203183 \cdot 1203183 \cdot 1203183 \cdot 1203183 \cdot 1203133 \cdot 120333 \cdot 1203133 \cdot 120333 \cdot 1203133 \cdot 120333 \cdot 1203333 \cdot 120333 \cdot 1203333 \cdot 120333 \cdot 120333 \cdot 120333 \cdot 120333 \cdot 1203333 $	8 4247252 469143 2131542 9053219 5229 4302455 476618 2098114 9027105 31 149 4354930 453777 2967064 9001921	$9^{+}4249895^{+}469498^{+}2\cdot129930^{+}9051983^{+}51^{-}30^{+}4305111^{+}476975^{+}2\cdot095543^{+}9025853^{+}30^{-}60^{-}4357548^{+}484^{+}36^{+}2\cdot06553^{+}10^{-}000654^{+}10^{-}10^{$	$10^{4252528} \cdot 469853^{2\cdot128321} \cdot 9050746^{50} 31^{4307736} \cdot 477332^{2\cdot094975} \cdot 9024600^{29} 32^{143601} \cdot 434495^{2\cdot064000} \cdot 3999386^{386} \cdot 10^{4\cdot12322} \cdot 10^{12\cdot12322} \cdot 10^{12\cdot12322} \cdot 10^{$	$111 \\ -4255161 \\ -470209 \\ 2 \\ -126713 \\ -9049509 \\ +49352 \\ -4303703 \\ -4710361 \\ -477689 \\ -477689 \\ -477689 \\ -477689 \\ -477689 \\ -477689 \\ -477689 \\ -477689 \\ -47689 \\ -47689 \\ -47689 \\ -47689 \\ -48657 \\ -48657 \\ -48657 \\ -48655 \\ -29684 \\ -29684 \\ $	$12^{+4257793} \cdot 470564 \cdot 2 \cdot 125108 \cdot 9048271 \cdot 4833 \cdot 4312986 \cdot 478047 \cdot 2 \cdot 091843 \cdot 9022092 \cdot 2753 \cdot 4365401 \cdot 485214 \cdot 2 \cdot 060944 \cdot 8996848 \cdot 2 \cdot $	$13^{1}4260425 \left[470919 \right] 2^{\cdot}123504 \left[9047032 \right] 47 \left[34 \right] 4315610 \right] 478404 \left[2^{\cdot}090280 \right] 990280 \left[90280 \right] 92654 \left[4368018 \right] 436573 \left[2^{\cdot}059418 \right] 8995578 \left[2^{\cdot}058018 \right] 138000000000000000000000000000000000000$	$14^{+283056} \cdot 471275 \cdot 2 \cdot 121903 \cdot 9045792 \cdot 4518234 \cdot 478762 \cdot 2 \cdot 088720 \cdot 9019582 \cdot 2 \cdot 555 \cdot 4370634 \cdot 485933 \cdot 2 \cdot 057895 \cdot 8994307 \cdot 2 \cdot 12823 \cdot$	$15^{\bullet} - 4265687 + 471630 + 2120303 + 9044551 + 4536 + 4230857 + 479119 + 2087161 + 9018325 + 2456 + 4373251 + 486293 + 2056373 + 8993035 + 2056373 + 2056774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 20567774 + 2057774 + 20577774 + 20577774 + 20577774 + 20577774 + 205777774 + 2056777777777777777777777777777777777777$	$16 \cdot 4268318 \cdot 471986 \cdot 218705 \cdot 9043310 \cdot 44 \cdot 377 \cdot 4323481 \cdot 479477 \cdot 2.085603 \cdot 9017068 \cdot 2357 \cdot 4375866 \cdot 486652 \cdot 2.054853 \cdot 8991763 \cdot 23657 \cdot 4375866 \cdot 486652 \cdot 2564853 \cdot 8991763 \cdot 23657 \cdot 236566 \cdot 236566 \cdot 23657 \cdot 236566 \cdot 236566 \cdot 23657 \cdot 23657 \cdot 236566 \cdot 23657 \cdot 23657$	$17^{-4}270949^{-4}72342^{-1}7110^{-9}042068^{-4}236103^{-4}79835^{-2}084048^{-9}015810^{-2}58^{-4}378482^{-4}87012^{-2}653334^{-8}990489^{-2}658^{-2}68^{-2}6$	$18^{-4}273579 + 472697 + 2^{-115516} + 9040825 + 42899 + 43028 + 20193 + 2^{-0}82495 + 9014551 + 2^{-1}21 + 2^{-0}31 + $	$19 \cdot 4276208 \cdot 473053 2 \cdot 113924 \cdot 9039582 \cdot 41 \cdot 40 \cdot 43313 \cdot 480551 \cdot 2 \cdot 080943 \cdot 9013292 \cdot 20 \cdot 60 \cdot 4383711 \cdot 487732 \cdot 2 \cdot 050303 \cdot 9887940 \cdot 2387940 \cdot 2387960 \cdot 238797960 \cdot 23879790 \cdot 23879790 \cdot 23879790 \cdot 23879790 \cdot 23879790 \cdot $		Tang.	
.I'ang.	HONOR I	corett.	.474122	.474478	.474834	.475191	475548	475904	.476261	·476618	.476975	477332	477689	.478047	478404	.478762	479119	479477	479835	480193	.480551		Cotang.	
Sine.	MON 1001.	1051925.	·4284095	.4286723	.4289351	.4291979	4294606	.4297233	•4299859	·4302485	-4305111	.4307736	4310361	4312986	4315610	4318234	4320857	4323481	4326103	4328726	4331348		/ / Cosine Cotang.	
	10	77	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		-	
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Cosine.	3200000	alneone.	·9061848	·906061S	.9059386	.9058154	9056925	·9055688	·9054454	·9053219	·9051983	·9050746	9049509	·9048271	·9047032	·9045792	·9044551	.9043310	·9042068	-9040825	·9039582	.9038338	Sine.	Deg. 64.
Tang. Cotang. Cosine.	0.111600	000541.2	2.142879	2.141253	2.139630	2-138008	2.136389	2.134771	2-133155	2.131542	2.129930	2.128321	2.126713	2.125108	$2 \cdot 123504$	2.121903	$2 \cdot 120303$	2.118705	2-117110	$2 \cdot 115516$	2.113924	2.112334	Tang.	
l'ang.	200000	Incuas.	.466661	.467016	467370	.467725	468079	.468434	.468789	.469143	•469498	•469853	470209	470564	470919	.471275	471630	.471986	472342	472697	473053	.473409	Cotang.	
Sine.	001000	0010225.	4228819	4231455	4231090	4236725	4239360	4241994	4244628	4247262	4249895	4252528	4255161	4257793	4260425	4263056	4265687	4268318	4270949	4273579	4276208	20 •4278338 •473409 2•112334 •9038338 40	' Cosine.	
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Cotang.		07/ ARA-T	1.988278	1.986838	1.095400	ANT-PORT	1.983963	1.982528	1.981095	1.979663	1.978233	1-976805	1-975378	1.973953	1.972529	701170-1	1-969687	1-968268	1.966851	1-965436	1.964022	1-962610	-	Tang.	
Tang.		£86206.	·502947	-503312	949603.	or bene.	-504041	-504406	.504771	-505136	-505501	·505866	·506232	-506597	506963	·507329	·507694	•508060	·508426	-508792	·509159	509525		Cotang.	
Sine.		·4490591	.4493190	.4495789	20000 V	1000674.	·4500984	.4503582	4506179	4508775	4511372	4513967	4516563	4519158	4521753	4524347	4526941	4529535	4532128	4534721	4537313	4539905		/ / Cosine. Cotang.	•
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Cotang. Cosine.		2.018908	2.017433	9.015959	007710	. 984480	2.013016	2.011547	2.010080	2.008615	2.007151	2.005689	2.004229	2.002771	2.001314	1-9999859	1.9984051	1-996953	1-995503	1-994055	1.992608	1-991163		Tang.	
Tang.		.495317	495679	1 090 2.	120001	40404 ··	.496766	.497129	497492	497855	.498218	.498581	498944	499308	17999671	.500035	500398	.500762	501126	-501490	-501854	-502218		Cotang.	
Sine.		.4438534	.4441140	847811h	0100111	4446352	4448957	4451562	4454167	4456771	4459375	4461978	4464581	4467184	4469786	4472388	4474990	4477591	4480192	4482792	4485392	4487992	e	/ / Cosine. Cotang.	
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Cosine. /		.4383711 [.487732 [2.050303].8987940 [6021].4438534].495317 [2.018908].8960994 [3941] [.4490591].502533]1.989720 [1985021].1989720 [1985021].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [1985022].1989720 [198502].198720 [198502].1989720 [198502].1989720 [198502].198720 [198502].19720 [19		1000000 100000 00000000000000000000000	e corroco	1 9601666. 046666.1 010600. 1966644. 14 06 911/668. 984610.2 104966. 2620444. 262044. 12204.	$-439416[+389173] - 2.044263] \cdot 8982834[56[25]+4448957] \cdot 496766[2\cdot013016] \cdot 8955824[35]45[+4500984] \cdot 504041] \\ 1\cdot 983963[\cdot 8923789] \cdot 150262224[35] \cdot 120262224[35] \cdot 12026224[35] \cdot 1202622424[35] \cdot 12026224224[35] \cdot 1202622422422422242222422224222242222422$	$-\frac{1}{296779} \cdot \frac{1}{489534} \cdot \frac{1}{2042757} \cdot \frac{1}{2981555} \cdot \frac{1}{55} \cdot \frac{1}{55} \cdot \frac{1}{56} \cdot \frac{1}{497129} \cdot \frac{1}{2011547} \cdot \frac{1}{8954529} \cdot \frac{1}{34146} \cdot \frac{1}{4503582} \cdot \frac{1}{504406} \cdot \frac{1}{1092528} \cdot \frac{1}{392828} \cdot \frac{1}{395456} \cdot \frac{1}{32} \cdot \frac{1}{3$	-3993999 - 489894 - 5041954 - 8980276 - 5427 + 4454167 + 497492 - 2010080 + 8953234 - 33177 + 4506179 + 504771 + 981095 + 8927169 + 139209 + 1392	44000004 4400255 2.039751 8978996 5328 4456771 497855 2.008615 8951938 32 48 4508775 505136 1.979663 8925868 12	4404615 440616 2.033251 8977715 5229 4459375 498218 2.007151 8950641 31 49 4511372 505501 1.978233 89245461	4007007 100077 2007658 8076428 51 30 4461978 498581 2005689 8949344 30 50 4513967 505865 19976805 8923234	10.440.0233.401.338.5.055556.60751511501311.4464581.498944.2.004229.8948045.29151.4516563.50623211.9753781.8921920	11. 4.19448. 401699. 633761. 6973868 4932. 4467184. 499308. 2002771. 8946746 2852. 4519158. 506597 1.973953 8920606	$15.4415050 + 92061 \\ 2 - 032568 + 89725584 + 8333 + 4469786 + 599671 \\ 2 - 001314 + 8945446 \\ 2 - 162 \\ 3 - 4521753 + 506963 \\ 1 - 972529 + 8919291 \\ 3 - 901314 + 3945446 \\ 2 - 152 \\ 3$	13.441 7668.402429.5.32775.89914734.44723388.5000351.9998591.8944146[26[54].4524347[-507329]1-971107]-8917975	14. 420.278. 402.783 2. 009987 8970014 4635 4474990 500398 1.998405 8942844 2555 4526941 507694 1.969687 8916659	15 -44 - 28 - 45 - 45 - 45 - 45 - 45 - 75 - 45 - 47 - 75 - 44 - 77 - 50 - 76 - 44 - 77 - 50 - 46 - 44 - 77 - 50 - 46 - 44 - 77 - 50 - 46 - 44 - 77 - 50 - 46 - 46 - 46 - 46 - 46 - 46 - 46 - 4	$16.4425406.4035072.026313\\ 8967440\\ 44.87\\ 44.80192\\ 501126\\ 1.995503\\ 8940240\\ 2357\\ 4532128\\ 508426\\ 1.966851\\ 8914024\\ 8914024\\ 8914024\\ 891695\\ 8914024\\ 891695\\ 8914024\\ 891695\\ 8914024\\ 891695\\ 8914024\\ 891695\\ 891655\\ 891555\\ 891555\\ 891655\\ 8915555\\ 8915555\\ 8915555\\ 8915555\\ 8915555\\ 8915555\\ 8915555\\ 8915555\\ 89155555\\ 89155555\\ 89155555\\ 8915555555\\ 891555555\\ 8915555555555555555555\\ 891555555555555555555555555555555555555$	$17 - 428104 - 493868 2 - 924828 8 9666 53 4282792 - 501490 \\ 1 - 994055 - 8938936 \\ 2 - 58 - 4582792 \\ 1 - 568792 \\ 1 - $	18-04-2012-023346 896-866 42 39 0-4485392 0-501864 1-992608 8937632 21 59 0-4537313 0-509159 1-964022 0-8911385	$19 \cdot 4433319 \cdot 4495592 \cdot 021685 \cdot 8963575 41 40 \cdot 4487992 \cdot 502218 1\cdot 991163 \cdot 8936326 20 60 \cdot 4539905 \\ 509525 1\cdot 962610 \cdot 8910065 + 100065 00000000000000000000000000000000$	20 .4435927 .494954 2.020386 .8962285 40	Sine.	00 - U
Cotang.	-	2.050303	107840.0	0.0470.0	107170.7	2.045770	2.044263	2-042757	2.041254	2.039751	2.038251	9.036753	2.035956	2.033761	2.032268	2.030776	2.029287	-027799	2.026313	2.024828	2-023346	2.021865	2.020386	Tang.	
Tang.		-487732	00088V.	Caroot.	007007.	.488813	.489173	489534	489894	490255	919007	27000A.	401338	009107	190304.	667607.	884607.	493145	703507	493868	494230	.494592	494954	Cotang. Tang.	
Sine.		4383711	1995396	0200001	4000440	4391653	4394166	4396779	4399399	4409004	1000015	LOGLUVV	8280044	4419448	4415059	4417668	449.0978	4492887	4495496	449.8104	4430712	4433319	4435927	Cosine.	
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		-8855288	.8853936	·8852584	.8851230	·8849876	·8848522	·8847166	·8845810	-8844453	·8843095	·8841736	·8840377	·8839017	·8837656	·8836295	·8834933	·8833569	·8832206	·8830841	·8829476		Sine.	Deg.
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Cotang.	1-906066	1.904719	1.903373	1-902029	1.900687	1.899346	1-898006	1.896668	1-895332	1.893997	1-892663	1.891331	1-890000	1.888671	1-887343	1.886017	1.884692	1.883369	1-882047	1-880726		Tang.	49
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Tang.	.524640	.525011	.525382	-525754	.526125	.526496	·526868	.527240	.527612	.527983	·528356	-528728	.529100	-529472	·529845	-530217	.530590	·530963	-531336	·531709		Cotang.	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sine.	4645845	•4648420	4650996	·4653571	-4656145	.4658719	4661293	.4663866	-4666439	.4669012	4671584	4674156	4676727	.4679298	4681869	4684439	4687009	4689578	4692147	4694716		Cosine.	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	-	11	12	43	14	15	16	47	8	49	50	51	52	53	54	55	56	22	28	20	60		-	
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Cosine	8882166	·8880830	·8879492	·8878154	·8876815	·8875475	-8874134	.8872793	·8871451	-8870108	·8868765	·8867420	\$566075	8864730	·8863383	-8862036	8860688	8859339	8857989	8856639		Sine.	Deg. 6
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Cotang.	1.933323	1.931945	1.930569	1.929195	1.927822	1.926451	1.925081	1.923713	1.922347	1.920982	1.919618	1.918256	1.916896	1.915537	1.914179	1.912823	1.911469	1.910116	1.908764	1.907414			
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Tang.	517244	517612	186716	·518350	.518719	680619.	.519458	-519827	-520197	•520567	•520936	•521306	-521676	•522046	-522417	-522787	-523157	.523528	-523899	.524269		Cotang.	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Sine.	4594248	4596832	4599415	4601998	4604580	4607162	4609744	4612325	4614906	4617486	4620066	+622646	4625225	4627804	4630382	4632960	4635538	4638115	4640692	4643269		Cosine,	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	-	21	22	23	24	25	26	27	30	59	30	31	32	33	34	35	36	37	38	39	40		1-	1
$\label{eq:constraints} \begin{array}{ c c c c c c c c c c c c c c c c c c c$	-	09	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	1	50
Sine. Tang. Cotang. -4539905 509525 1-962610 -4543997 5095391 1-961200 -45459088 510855 1-9612010 -4554908 5100525 1-9693791 -4555089 5100525 1-958383 -4555089 511025 1-954371 -4555080 511755 1-949171 -4555049 511755 1-941371 -4555049 511755 1-941371 -4555038 512093 1-941377 -4566824 513315 1-941397 -45653316 513393 1-941620 11 4568392 513303 1-941620 13 457715 5194733 1-941620 1457715 513303 1-941620 1-942308 13 4577153 5145770 1-942308 14577153 5145770 1-942308 1-942308 14577153 515401 1-940233 1-941620 154577153 515401 1-940238 1-9	Cosine.	-8910065	·8908744	·8907423	·8906100	·8904777	·8903453	·8902128	·8900803	·8899476	.8898149	·8896822	·S895493	·8894164	·8892834	·8891503	.8890171	.8888839	8887506	-8886172	·8884838	8883503	1	Deg. 6
Sine. Tang. 45539905 509535 45423497 509531 45423497 509531 4547679 510655 44555499 510655 4455549 510655 4455549 511358 4455549 511358 4455549 511358 4455549 511395 10 4568316 512827 11 4555336 5113195 11 4568392 513393 12 457316 513393 13 4571395 511393 14 4570979 513393 13 4573966 514393 14 4570979 513393 15 4570979 513393 16 4589392 515401 17 4586496 516138 18 4586496 516506 19 4591908 516506 20 4591908 516506 2154911 516506	Cotang.	1-962610	1.961200	1.959791	1-958383	1-956978	1-955573	1-954171	1-952770	1.951371	1.949973	1-948577	1-947182	1-945789	1-944398	1-943008	1.941620	1-940233	1.938848	1.937464	1-936082	1-934702	Tang.	
Sine. Si	Tang.	509525	168602	-510258	-510625	·510991	.511358	.511725	-512093	.512460	-512827	.513195	-513562	.513930	-514298	•514665	•515033	•515401	.515770	•516138	·516506	-516875	Cotang.	
· · · · · · · · · · · · · · · · · · ·	Sine.	4539905	4542497	4545088	4547679	4550269	4552859	4555449	4558038	4560627	4563216	4565804	4568392	4570979	4573566	4576153	4578739	4581325	4583910	4586496	4589080	4591665	Cosine.	
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Cosine. /	72858	71462 1	70064 1	68666 1	67268 1.	65868 1	64468 1	63067 1	61665 1	60263 1	58859	57455	56051	54645	53239	51832	50425	49016	476071	46197		Sine.	Deg. 61.
tang. Co	78- 66775	26537 -87	25276 -87	24017 -87	22759 -87	21502 -87	20247 -87	18993 -87	17740 -87	16489 -87	15239 -87	13990 -87	12743 -87	11496 -87	10252 -87	78-80060	78- 99770	06525 -87	05286 -87	04047 -87		Tang.	•
Tang. Cotang.	106 1.8:	7484 1.85	862 1.85	3240 1.85	818 1.85	3997 1.85	375 1.85	754 1.8]	133 1.8]	1512 1.8]	18.1 1680	1270 1.8]	650 1.8]	2029 1.81	2409 1.8	2789 1.80	3168 1.80	3548 1.80	3928 1.8(1309 1.80			
Sine. Ta	683 -54	235 547	786 547	337 -548	888 -548	438 -548	987 -549	537 -549	086 -550	634 550	182 -550	730 -551	277 -551	824 -555	370 -555	916 -552	462 555	007 -55	552 -555	096 -534		ne. Cot	-
	41 .4799	42 -4802	43 -4804	44 .4807	45 -4809	46 -4812	47 -4814	48 4817	49 -4820	50 -4822	51 .4825	52 .4827	53 -4830	54 -4832	55 -4835	56 -4837	57 -4840	58 .4843	59 -4845	60 -4848		/ / Cosine. Cotang.	
	3 39	11 38	19 37	36 36	2 35	7 34	12 33	6 32	9 31	1 30	3 29	14 28	11 27	3 26	22 25	10 24	17 23	3 22	9 21	14 20	_	1	61.
Cosine.	-880063	-879925	9879786	-879646	-879510	-879371	.879233	-879094	-878955	-878817	·878678	.878539	.878400	.878261	-878122	-877983	·877843	·877704	-877564	.877425	1	Sine.	Deg. 61.
Tang. Cotang.	1.853325	1-852035	1-850747	1.849461	1.848176	1.846892	1.845609	1.844328	1.843049	1.841770	1.840494	1-839218	1.837944	1.836671	1.835399	1-834129	1.832861	1-831593	1-830327	1-829062		Tang.	
l'ang.	-539570	·539946	·540322	$\cdot 540698$	·541074	.541450	-541826	.542202	.542579	.542955	-543332	.543709	.544086	-544463	·544840	-545217	.545595	.545972	.546350	.546728		Cotang.	
Sine.	4748564	4751124	-4753683	4756242	·4758801	4761359	4763917	4766474	4769031	.4771588	·4774144	4776700	4779255	4781810	4784364	4786919	4789472	4792026	4794579	4797131		/ / Cosine. Cotang.	
	021	9 22	623	724	6 25	526	427	3 28	2 29	1 30	031	932	333	734	6 35	536	137	3 38	2391	140	0	-	
I ang. Cotang. Cosine.	0.4694716 531709 1.880726 8829476 6021 4748564 533570 1.853325 8800633 3941 4799683 547106 1.827799 8772858 19	4697284 532082 1 879407 8828110 5922 4751124 539946 1 852035 8799251 3842 4802235 547484 1 826537 8771462 1	$-4699852 \cdot 532455 \left[1\cdot878089 \right] \cdot 8826743 \\ \left[58 \right] \cdot 3216 \cdot 323 \\ \left[1\cdot850747 \right] \cdot 8797869 \\ \left[37 \right] \cdot 4804786 \\ \left[\cdot547862 \right] \cdot 8726 \\ \left[\cdot8770064 \right] \\ \left[17 \right] \cdot 8725 \\ \left[17 \right] \cdot 8725$	$-4702419 \cdot 532829 \\ 1 \cdot 876773 \cdot 8825376 \\ 57/24 \\ 1 \cdot 4756242 \cdot 540698 \\ 1 \cdot 89461 \\ 1 \cdot 879461 \\ 1 \cdot 8796466 \\ 36/44 \\ 1 \cdot 4807337 \\ \cdot 548240 \\ 1 \cdot 824017 \\ \cdot 8768666 \\ 1 \cdot 8764 \\ 1 \cdot 876666 \\ 1 \cdot 8766 \\ 1$	$-4704986 \cdot 533202 \\ 1 \cdot 8775458 \cdot 8824007 \\ 56 \\ 25 \cdot 475880 \\ 1 \cdot 541074 \\ 1 \cdot 848176 \\ 1 \cdot 848176 \\ 1 \cdot 8795102 \\ 35 \\ 45 \\ 1 \cdot 4809888 \\ 1 \cdot 548618 \\ 1 \cdot 822759 \\ 1 \cdot 8705768 \\ 1 \cdot 582759 \\ 1 \cdot 8795102 \\ 1 \cdot$	$\cdot 4707553 \\ \ 533576 \\ 1 \cdot 874145 \\ \cdot 8822638 \\ 1526 \\ \cdot 4761359 \\ \cdot 541450 \\ 1 \cdot 846892 \\ \cdot 8793717 \\ 1 \cdot 8416 \\ \cdot 4812438 \\ \cdot 548293 \\ \cdot 1 \cdot 821502 \\ \cdot 8765868 \\ 1 \cdot 876586 \\ \cdot 876586$	$-4710119 \cdot 533950 \cdot 1.872833 \cdot 8821269 \cdot 5427 \cdot 4763917 \cdot 541826 \cdot 1.845609 \cdot 8792332 \cdot 3347 \cdot 4814987 \cdot 549375 \cdot 1.820247 \cdot 8764468 \cdot 13876 \cdot 12876 \cdot 12876$	$\cdot 4712685 \cdot 534324 \cdot 1 \cdot 871523 \cdot 8819898 \cdot 53282 \cdot 4766474 \cdot 542202 \cdot 1 \cdot 844328 \cdot 8790946 \cdot 3248 \cdot 4817537 \cdot 549754 \cdot 1 \cdot 818993 \cdot 8763067 \cdot 1 \cdot 812685 \cdot 549754 \cdot 1 \cdot 81268 \cdot$	$-4715250 \cdot 534698 \cdot 1 \cdot 870214 \cdot 8818527 \cdot 5229 \cdot 4769031 \cdot 542579 \cdot 1 \cdot 843049 \cdot 8789559 \cdot 3149 \cdot 4820086 \cdot 550133 \cdot 1 \cdot 817740 \cdot 8761665 \cdot 1 \cdot 8761665 \cdot 1 \cdot $	$9^{-4717815} \cdot 535072 \\ 1 \cdot 668906 \cdot 8817155 \\ 51 \\ 30 \cdot 477158 \\ 1 \cdot 54255 \\ 1 \cdot 841770 \\ 1 \cdot 841770 \\ 1 \cdot 8788171 \\ 30 \\ 50 \\ 51 \\ 2 \cdot 82263 \\ 1 \cdot 84187 \\ 1 \cdot 8689 \\ 1 \cdot 8760 \\ 2 \cdot 88817 \\ 1 \cdot 868 \\ 1 \cdot 8881 \\ 1 \cdot 88$	$(0^{-4}720380) \cdot 535446 \\ 1 \cdot 867600 \cdot 8815782 \\ 50 \\ 31 \\ 1 \cdot 4774144 \\ \cdot 543332 \\ 1 \cdot 840494 \\ \cdot 8786783 \\ 29 \\ 51 \\ 1 \cdot 825182 \\ \cdot 550891 \\ 1 \cdot 815239 \\ \cdot 815239 \\ \cdot 8158859 \\ \cdot 8758859 \\ \cdot 8758859 \\ \cdot 8758859 \\ \cdot 8758559 \\ \cdot 8755559 \\ \cdot 875559 \\ \cdot 875559$	$1^{-4722944} \cdot 535820 \\ 1^{-62235} \cdot 814409 \\ 4932 \cdot 4776700 \\ 543709 \\ 1^{-543709} \\ 1^{-533218} \cdot 8785394 \\ 285294 \\ 2852 \cdot 4827730 \\ 551270 \\ 1^{-813990} \\ 1^{-872345} \\ 2852 \cdot 4827730 \\ 1^{-8}28 \\ 2852 \cdot 4827730 \\ 1^{-8}28 \\ 2852 \cdot 4827730 \\ 1^{-8}28 \\ 1^{-8$	$2^{-4725508} \cdot 536195 \left[1 \cdot 864992 \cdot 8813035 \left[48 \right] 3 \cdot 4779255 \left[\cdot 544086 \right] 1 \cdot 837944 \cdot 8784001 \left[27 \right] 53 \cdot 4830277 \cdot 551650 \left[1 \cdot 812743 \cdot 875605 \right] \left[\cdot 8127605 \right] \left[\cdot 8127605$	$13^{-4723071} \cdot 536569 \\ 1\cdot 863690 \cdot 8811660 \\ 4734 \cdot 4781810 \cdot 544463 \\ 1\cdot 836671 \cdot 8782613 \\ 2664 \cdot 4832824 \cdot 552029 \\ 1\cdot 811496 \cdot 8754655 \\ 1\cdot 872465 \\ 1\cdot 872465 \\ 1\cdot 87265 \\ 1\cdot 8726$	$14^{4} 4730634^{1} \cdot 536944 \\ 1 \cdot 862389 \cdot 8810284 \\ 46 \cdot 35 \cdot 4784364 \\ \cdot 544840 \\ 1 \cdot 835399 \cdot 8781222 \\ 25 \cdot 652409 \\ 1 \cdot 81252 \\ \cdot 552409 \\ 1 \cdot 810252 \\ \cdot 8753239 \\ \cdot 8763239 \\ \cdot 8763239 \\ \cdot 8763239 \\ \cdot 8763239 \\ \cdot 876323 \\ \cdot$	$15^{-4733197} \cdot 537319^{-537319} \cdot 861090 \cdot 8808907 + 536 \cdot 4786919 \cdot 545217 + 824129 \cdot 8779830 \cdot 24 56 \cdot 4837916 \cdot 552789 + 809008 \cdot 8751832 \cdot 8779830 \cdot 24 56 \cdot 4837916 \cdot 552789 + 562789 \cdot 562789 + 562789 + 562789 \cdot 562789 + 562789 $	$[6] \cdot 4735759 \cdot 537694 \\ 1 \cdot 859792 \cdot 8807530 \\ 4 \cdot 4789472 \\ \cdot 545695 \\ 1 \cdot 82286 \\ 1 \cdot 82286 \\ 1 \cdot 8778437 \\ 2 \cdot 357 \\ 1 \cdot 4840462 \\ \cdot 553168 \\ 1 \cdot 807766 \\ \cdot 87766 \\ \cdot 8760425 \\ \cdot 8$	$17^{4738321} \cdot 538069 \\ 1 \cdot 538496 \cdot 8806152 \\ 4 \cdot 3388 \cdot 4792026 \cdot 545972 \\ 1 \cdot 831593 \cdot 8777043 \\ 2 \cdot 258 \cdot 4843007 \cdot 553548 \\ 1 \cdot 806525 \cdot 8749016 \\ 2 \cdot 253548 \\ 1 \cdot 806525 \cdot 8749016 \\ 2 \cdot 253548 \\ 1 \cdot 806525 \cdot 8749016 \\ 2 \cdot 253548 \\ 1 \cdot 806525 \cdot 8749016 \\ 2 \cdot 253548 \\ 1 \cdot 806525 \cdot 8749016 \\ 2 \cdot 253548 \\ 1 \cdot 806525 \cdot 8749016 \\ 2 \cdot 253548 \\ 1 \cdot 806525 \\ 2 \cdot 806555 \\ 2 \cdot 806555 \\ 2 \cdot 806555 \\ 2 \cdot 8065555 \\ 2 \cdot 806555 \\ 2 \cdot 806555 \\ 2 \cdot 8065$	$18! \cdot 4740882 \cdot 533444 \cdot 1 \cdot 857201 \cdot 8804774 \cdot 42391 \cdot 4794579 \cdot 546350 \cdot 1 \cdot 830327 \cdot 8775649 \cdot 21 \cdot 591 \cdot 4845552 \cdot 553928 \cdot 1 \cdot 805286 \cdot 8747607 \cdot 1 \cdot 87266 \cdot 1 \cdot$	$19^{-4743443} \cdot 538319 \\ 1\cdot 855908 \cdot 8803394 \\ 41 \\ 40 \cdot 4797 \\ 13 \\ 1\cdot 5467 \\ 28 \\ 1\cdot 829062 \cdot 8774254 \\ 20 \\ 60 \cdot 4848096 \cdot 554309 \\ 1\cdot 804046 \\ 1\cdot 8046197 \\ 1\cdot 8746197 \\ 1\cdot 8746197 \\ 1\cdot 8746197 \\ 1\cdot 8746197 \\ 1\cdot 874619 \\ 1\cdot 87461$	20 4746004 539195 1.854615 8802014 40	Sine.	Deg. 61.
Cotang.	1-880726	1.879407	1-878089	1-876773	1-875458	1.874145	1.872833	1-871523	1-870214	1-868906	1-867600	1-866295	1.864992	1-863690	1-862389	1-861090	1.859792	1-858496	1.857201	1.8555908	1-854615	Tang.	
I ang.	-531709	-532082	-532455	.532829	-533202	533576	.533950	-534324	•534698	-535072	•535446	-535820	-536195	•536569	·536944	•537319	·537694	-538069	·538444	·538819	-539195	Cotang.	
olne.	4694716	4697284	4699852	4702419	4704986	4707553	4710119	4712685	4715250	4717815	.4720380	4722944	4725508	4728071	4730634	4733197	4735759	4738321	4740882	4743443	4746004	' Cosine.	
	0	1	63	ŝ	4	5	9	2	00	6	10	11	12	13	14	15	16	17	18	19	20	-	

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29 Deg. 29 Deg. 29 Deg. 29 Deg. 20 Sine. 7 Sine. 5 Sine. 7 Sine. 5 Si			-				L	-			in.		_				_		_			-		
29 Deg. 29 Deg. 29 Deg. 29 Deg. 29 Deg. 29 Deg. 716410 3141 4365060 554300 1753186 6683756 571161 17763018 5683756 5716411 3141 4955060 5770004 1754375 8688736 1 4880660 55545600 1:801447 8744781 562321 1:77310 8714418 3141 4952060 5770361 17533186 86886313 2 4865777 5555400 1:801047 8744705165823 1:773013 3544 4952065 577161 1:7750319 86883434 2 4865777 55554601 1:801037 562334 1:77305 871493 3663751 1:7793103 1:77305 8688333 1:741495 868033 5653441 1:773307 871133 1:741951 1:7703193 8671965 877055 8671966 877055 8671966 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 877055 8770555 8770555 8770555		1	19	18	17	16	15	14	13	12	11	10	6	00	2	9	5	4	en 	\$2	-	0	2	~
29 Deg. 20 Deg. <t< td=""><th></th><td>Cosine.</td><td>8687756</td><td>8686315</td><td>·8684874</td><td>.8683431</td><td>8861898</td><td>·8680544</td><td>00162980</td><td>-8677655</td><td>-8676209</td><td>·8674762</td><td>·8673314</td><td>·8671866</td><td>-8670417</td><td>7968998-</td><td>·8667517</td><td>·9666066</td><td>·8664614</td><td>·8663161</td><td>-8661708</td><td>·8660254</td><td>1.000</td><td>Sine.</td></t<>		Cosine.	8687756	8686315	·8684874	.8683431	8861898	·8680544	00162980	-8677655	-8676209	·8674762	·8673314	·8671866	-8670417	7968998-	·8667517	·9666066	·8664614	·8663161	-8661708	·8660254	1.000	Sine.
29 Deg. 20 Deg. 20 Deg. 21 Deg. 7 ang.		Cotang.	1.754372	1.753186	1.752002	018092.1	1.749637	1.748456	1.747276	1.746098	1.744921	1.743745	1.742570	1.741396	1-740224	1.739053	1.737883	1.736714	1.735546	1.734380	1-733214	1.732050		Tang.
29 Deg.29 Deg. <th></th> <td>Tang.</td> <td>·570004</td> <td>·570389</td> <td>-570775</td> <td>·571161</td> <td>·571547</td> <td>·571933</td> <td>.572319</td> <td>.572705</td> <td>·573091</td> <td>.573478</td> <td>·573864</td> <td>.574251</td> <td>-574638</td> <td>.575025</td> <td>-575412</td> <td>.575799</td> <td>-576187</td> <td>·576574</td> <td>.576962</td> <td>.577350</td> <td></td> <td>Cotang.</td>		Tang.	·570004	·570389	-570775	·571161	·571547	·571933	.572319	.572705	·573091	.573478	·573864	.574251	-574638	.575025	-575412	.575799	-576187	·576574	.576962	.577350		Cotang.
29 Deg. 20 Deg. <t< td=""><th>Deg.</th><td>Sine.</td><td>4952060</td><td>·4954587</td><td>.4957113</td><td>-4959639</td><td>-4962165</td><td>4964690</td><td>4967215</td><td>4969740</td><td>4972264</td><td>4974787</td><td>4977310</td><td>4979833</td><td>4982355</td><td>4984877</td><td>4987399</td><td>4989920</td><td>4992441</td><td>4994961</td><td>4997481</td><td>5000000</td><td></td><td>Cosine.</td></t<>	Deg.	Sine.	4952060	·4954587	.4957113	-4959639	-4962165	4964690	4967215	4969740	4972264	4974787	4977310	4979833	4982355	4984877	4987399	4989920	4992441	4994961	4997481	5000000		Cosine.
29 Deg. 29 Deg. 29 Deg. 1 Sine. Tang. Cotang. Cosine. / 0 4848006 554309 1-801447 Sine. Tang. Cosine. / 1 4850144 555460 1-801575 87436155 87416197 65 87116419 30 1-4850144 555460 1-801257 874355 55 49111572 5653231 1-775320 87116710 35 2-4860812 5555460 1-91963 57 24-911572 563354 1-775320 8710710 35 2-4860812 5555450 1-99107 8744055 572 4-991393 564421 1-775302 8710710 35 2-4860815 5556973 1-799107 874057 556383 1-772302 8770373 39 2-4868365 5556973 1-7992961 8773891 52 4911105 56556735 1-772302 87703557 30 1-4870557 5557355 1-9924295 557321	29	- 1	41	42	43	44	45	46	47	48	49	50	19	52	53	54	55	56	22	28	69	60		-
29 Deg. 29 Deg. 29 Deg. 29 Deg. 7 ang. Cotang. Cosine. 0 4848096 554309 18804047 8746197 60 21 4901433 565321 1775340 8716419 1 48505727 5554309 18801575 8743755 553 4900503 565307 17775730 87141993 2 48568727 55556831 1799107 8741965 553 49191572 5653854 1775730 8710710 2 4866812 5556873 1799107 8740555 553 49191572 553384 177471 8713136 2 4866812 5556973 1799107 8740555 543411677 556376 1772302 87107103 3 4866815 5556973 17792105 873472 55364 97117108 8700492 4866816 5557736 1797104 55324 4919638 5646541 177772302 87004929 11 4868826 5557724 1765704 865		-	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20		~
29 Deg. 29 Deg. 29 Deg. 29 Deg. 7 Sine. Tang. Cotang. Cosine. / Sine. Tang. Cotang. 1 4850040 554309 1-802055 Sine. Tang. Cotang. Sine. Tang. Cotang. 1 4850041 554468 1-802155 Strats155 23 4906503 555271 1-77330 2 4850372 5555451 1-80157 Strat375 55 24911572 565371 1-773302 2 4856372 5555971 1-799107 8741365 55 24 491117 565065 1-773302 2 4866835 5556973 1-799107 8743555 52 24 491171 565065 1-773302 8 486837 5556973 1-799107 873337 55 24 491171 565055 1-772302 8 486836 555673 1-799107 8733837 55 24 491171 565055 1-772302 1 4870557 55581 1-799107 8733837 55 29 491171 565055 1-775302 1 48705551 1 4873857 555772 <th></th> <td>Cosine.</td> <td>.8716419</td> <td>8714993</td> <td>·8713566</td> <td>·8712138</td> <td>.8710710</td> <td>18260781</td> <td>·8707851</td> <td>8706420</td> <td>·8704989</td> <td>-8703557</td> <td>.8702124</td> <td>1690078.</td> <td>-8699256</td> <td>8697821</td> <td>8696386</td> <td>.8694949</td> <td>.8693512</td> <td>.8692074</td> <td>-8690636</td> <td>·8689196</td> <td></td> <td>Sine.</td>		Cosine.	.8716419	8714993	·8713566	·8712138	.8710710	18260781	·8707851	8706420	·8704989	-8703557	.8702124	1690078.	-8699256	8697821	8696386	.8694949	.8693512	.8692074	-8690636	·8689196		Sine.
29 Deg. 29 Deg. 29 Deg. 1 Sine. Tang. Cotang. Cosine. / / Sine. Tang. 0 4850040 554309 1804047 8744197 6021 4901433 562321 1 4850040 555450 1802810 8734735 5523 49005308 5523704 2 48563735 5556311 1799107 87441365 564337 5563735 5563735 5563735 55663735 5563735 55663735 $556536766666666666666666666666666666666$		Cotang.	1.778340	1.777130	1.775921	1.774714	1.773507	1.772302	1.771098	1.769895	1.768694	1.767494	1.766295	1-765097	1.763900	1.762705	1.761511	1.760318	1.759126	1.757936	1.756747	1-7555559		Tang.
29 Deg. 29 Deg. 29 Deg. 1 Sine. Tang. Cotang. Cosine. / / Sine. 1 Sine. 1330 554309 1804047 87446197 6021 4901433 1 4850641 5554509 180201575 87741786 532 49005039 2 4856377 5555450 18741786 532 49016503 2 4866877 5555431 1799107 87741956 552 4911105 6 4866897 5556371 1797875 87337725 5427 49196737 6 4866895 5557356 1799107 87740555 532 4991177 8 4866895 5557356 1799177 877337725542 87733725 4919177 8 4866895 5557356 17991772 87733637755 4932493919776 10 4870977 557736 17991772 87733637755 49191771 11 48736317 5557356 17991272 492427676 <th></th> <td>'Tang.</td> <td>.562321</td> <td>·562704</td> <td>·563087</td> <td>.563471</td> <td>•563854</td> <td>·564237</td> <td>-564621</td> <td>565005</td> <td>•565388</td> <td>.565772</td> <td>-566156</td> <td>·566541</td> <td>-566925</td> <td>.567309</td> <td>•567694</td> <td>.568079</td> <td>•568463</td> <td>·568848</td> <td>.569233</td> <td>.569619</td> <td></td> <td>Cotang.</td>		'Tang.	.562321	·562704	·563087	.563471	•563854	·564237	-564621	565005	•565388	.565772	-566156	·566541	-566925	.567309	•567694	.568079	•568463	·568848	.569233	.569619		Cotang.
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	Tang. Cotang. Cosine.	0 -150381 -600860 1-664279 -85711673 600205 1-641482 -5540051 3941 -525241 617210 1-640143 8508111 1-515387 -601552 1-660304 -8571157 610402 1-650438 355065 1-619138 8508113 2-515387 -601552 1-660304 -8567175 5724 5210065 1-61813 55254717 611611 1-61938 8505053 3-515387 -602449 1-660904 -8567175 572101 1-631313 8533923 3544 -5250665 618303 8505053 3-5165387 -6023413 1-65570 610301 1-63114 1-61932 8509553 8509563 8604 -525065 1-61432 8619323 8509563 86044 9506563 8614332 8509563 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 8619323 86	Tang.	
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31 Deg.	Sine.	62552341 6254717 6254717 6254717 62547191 6525189 6526189 65264855 65264855 65264855 65279443 65279443 65279443 65279443 65284855 65284383 65284383 65284383 65284385 65284385 65294258 65294258 65291790 65294258 65291258	/ / Cosine. Cotang.	
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	Tang. Cotang. Cosine.	1-641482 1-641482 1-640408 1-639335 1-639335 1-6393131 1-637391 1-635632 1-635639 1-633917 1-633597 1-633597 1-625659 1-625659 1-625659 1-625659 1-6254536 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-6254556 1-625455656 1-6254556565656565656565656565656565656565	Tang.	
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31 Deg.	Sine.	5202646 5202130 5207613 5212679 5212679 5217546 5227466 5227466 5224903 5224903 5224903 5224903 5224903 5224913 5224913 5224913 52247290 52247290	/ / Cosine	
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	1	00000000000000000000000000000000000000	-	. 58
	Cosine.	857167; 8570167; 85570167; 85570167; 8556167; 8556167; 8555665; 85556166; 85556166; 85556166; 85556166; 85556162; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556136; 85556137; 85556136; 8555665; 85556565; 85556565; 8555665; 85556565; 8555655655656556	Sine.	Deg. 58.
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31 Deg.	Sine.	6150381 6150381 6155367 6155367 6155367 6160351 6160351 6157382 6157382 6157382 6175293 6177982 617782 617782 617782 617782 617782 617782 617782 617782 617782 617782 617782 617782 617782 617787 6177787 617777777777	Cosine. Cotang.	
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32 Deg.

32 Deg.

NATURAL SINES AND TANGENTS TO A RADIUS 1.

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I ang. Cotang.		2201150 0210000 0210000 0210000 0210000 0210000 02100000 02100000 021000000 021000000 021000000 02100000000		0.0011.01.02.0161.020.0041 041.021.02.02.01.01.024.01.024.01.024.01.024.01.024.01.024.01.026.01.024.01.063.04.01.063.04.01.024.01.024.01.063.04.01.063.04.01.024.01.024.01.043.01.044.01.04	-2000-2011-0220121-0220121 - 022012	1.553680	1 1060/07 0 03063311 100000 1117145 0 0410 01010440 02/07.0 104000 010000 000000 0000000000000000	2913986 -627298 -1504140 - 1004142 - 1966 - 1966 - 21/2/9.1 + + + + + + + + + + + + + + + + + + +	2100000150. de01c0.1 de14440. 280114c. 84 22. 620231 201120. 122392 8000 8000 8000 8000 8000 8000 8000 80	$\bullet 5318913 \cdot 628109 1 \cdot 592078 \cdot 8468126 [5229] \cdot 5370543 \cdot 636661 [1 \cdot 570693 \cdot 8435477] 31 [49] \cdot 5419527 \cdot 644867 [1 \cdot 550705 \cdot 8404090] \cdot 5419527 \cdot 5419527 \cdot 541957 \cdot 5$	$\frac{1}{6321376}, \frac{1}{628515}, \frac{1}{691050}, \frac{1}{8466579}, \frac{1}{5130}, \frac{1}{5372996}, \frac{1}{637070}, \frac{1}{1569685}, \frac{1}{8433914}, \frac{1}{30}, \frac{1}{5421971}, \frac{1}{645279}, \frac{1}{1}, \frac{1}{549715}, \frac{1}{8402513}, \frac{1}{1}, $	$0.5328399 \\ -628921 \\ 1.590023 \\ -8465030 \\ 50 31 \\ -5375449 \\ -637449 \\ -6374479 \\ 1.568678 \\ -8423351 \\ 2951 \\ -5424415 \\ -645691 \\ 1.548726 \\ -8400936 \\ -8400036 \\ -84000036 \\ -8400000000000 \\ -84000000000000000 \\ -8400000000000000 \\ -84$	-5356301, -639377, -588997, 8463481, 49329, -5377902, -637888, 1-567672, -8430787, 28562, -5426859, -646104, 1-547738, -8399357, -539657, -5396357, -5396357, -5396357, -5396357, -539677, -5396777, -539677, -5	-328763, -699733, -58973, -58461932, -5380354, -6382971, -566666, -8429222, 27753, -5429302, -646516, 1-546751, -8397778, -5328763, -646751, -646516, -646566666, -6465666666, -64656666666, -64656666666666666666666666666666666666	3.531224 , 630139 , 636949 , 84603814734 , 6382306 , 6387071 , 565662 , 84276572654 , 5431744 , 646929 , $1\cdot545764$, 8396199 , $3\cdot531224$, 626929 , 52431744 , 646929 , $1\cdot545764$, 8396199 , $51\cdot545764$, $52\cdot5767$, $52\cdot57677$, $52\cdot57677$, $52\cdot57677$, $52\cdot57677$, $52\cdot57677$, $52\cdot57677$, $52\cdot576777$, $52\cdot576777$, $52\cdot5767777$, $52\cdot5767777777777777777777777777777777777$	(4.5333686 + 630546 1 + 585526 8458830 + 635 + 5385257 639116 1 + 564659 8426091 25 5434187 647734 1 + 544779 8394618 1 + 533546 1 + 544779 1 + 54779 1 + 547	$5.5336145 \cdot 630953 1 \cdot 584904 \cdot 845728 45 \\ 36 \cdot 5387708 \cdot 639526 \left[1.56355 \cdot 8424524 \\ 2456 \cdot 5436628 \\ 647754 \\ 1.543794 \cdot 8393037 \\ 1.543794 \cdot 8393037 \\ 1.543794 \cdot 84972 \\ 1.553794 + 84972 \\ 1.557794 + 84972 \\ 1.5577$	$e_{1,5338605,631359}[1,583883]; 8455726[44]37[:5390158]; 639936[1:562654]; 8422356[23]57[:5439069]; 648167[1:542810]; 8391455[:53386054]; 8422356[:53386056]; 8422356[:5438066]; 84223666]; 842236660]; 84223660]; 84223660]; 84223660]; 842236660]; 842226660]; 842226660]; 842226660]; 842226660]; 842226660]; 842226660]; 842226660]; 842226660]; 8422266600]; 842226660]; 842226660]; 842226600]; 842226660]; 84222660$	7.5341065.6317661.582869.4454179.43881.5392608.64034611.561654164233882258.5441510.6485801.5418281633839873	$ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $	$19 \\ 5345982 \\ 632581 \\ 1 \\ 580825 \\ 8451064 \\ 41140 \\ 5397507 \\ 641167 \\ 1 \\ 559655 \\ 841167 \\ 1 \\ 559655 \\ 8418249 \\ 2060 \\ 5446390 \\ 6446307 \\ 6424677 \\ 1 \\ 53985706 \\ 642670 \\ 1 \\ 53985706 \\ 642670 \\ 1 \\ 53985706 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 5398570 \\ 1 \\ 1 \\ 5398570 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ $	J	Tang.	2
.1 ang.	.641577	.641988	.642399	018679.	166879.	106969579.	******	540440.	0054550.	-644867	.645279	.645691	·646104	.646516	.646929	.647341	-647754	·648167	.648580	•648994	·649407		Cotang.	
Sine.	5399955	5402403	5404851	8062079	5400745	1010101720	1014140	1007140	2807.146	5419527	5421971	5424415	5426859	5429302	5431744	5434187	5436628	5439069	5441510	-5443951	5446390		/ / Cosine. Cotang.	
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-	39	38	37	36	22	10	00	00	32	31	130	29	128	27	26	125	1 24	3 23	3 22	321	3 20		-	5
Cosine.	-8447952	-8446395	844483	0466448.	JOY LAND	1210140.	1010550	100207010	-8437035	.8435477	·8433914	·8432351	·8430787	.8429222	.8427657	·8426091	·8424524	.8422956	.8421386	.8419819	-8418249		Sine.	Deg. 57.
Cotang.	1.578791	1-577776	1.576761	772777	141010.1	00/11/0-1	07/0/0.T	21/2/0.1	1.571702	1-570693	1.569685	1.568678	1-567672	1.566666	1.565662	1.564659	1.563656	1-562654	1-561654	1-560654	1-559655		Tang.	
Tang.	.633395	633803	116789	013763	C10400-	1200000.	0040000	+130844	636252	·636661	·637070	.637479	.637888	.638297	638707	.639116	.639526	-639936	•64.0346	.640756	-641167		Cotang.	
Sine.	5350898	5353355	5355819	5060000	Percent	57/002C.	6/19020.	5369634	-5368089	5370543	-5372996	5375449	-5377902	5380354	5382806	5385257	5387708	5390158	5392608	5395058	5397507		/ / Cosine. Cotang.	
_	5	66	2 6	2 6	# U	20	0.2	22	58	29	30	31	32	33	34	35	36	37	38	39	40		-	
-	60	202	2 10	100	0	200	200	54	3 53	522	51	50	49	48	47	46	45	44	43	42	41	340	1	11
Cosine.	.8480481	0208718.	064418	CO 140	COC/ #0.	.94/430	-84/2/6	.847121	.846967	-8468120	-8466579	-8465030	8463481	-846193	-8460381	-8458830	.8457278	.8455726	8454175	.8452618	-8451064	.8449508	Sine.	Der 57.
Cotang.	1-600334	1.500900	V26002.1	*0*060.T	162/AC.T	1-596198	1-595167	1.594136	1-593107	1.592078	1-591050	1-590023	799886.1	1.587973	1-586949	1.585926	1.584904	1.5,83883	1.582862	1.581843	1.580825	20 -5348440 -632988 1-579807 -8449508 40	Tang.	
Tang.	098769.	646369	0120200	0/0020.	280929-	-626488	·626893	.627298	-627704	.628109	628515	628921	7.620.99.	629733	630139	630546	630953	631359	992129	639.173	632581	632988	Cotang.	
Sine.	5900103	6301650	001000	10714000	190005	2309057	5311521	5313986	5316450	5318913	5321376	5323839	5326301	5328763	5331224	5333685	5336145	5338605	5341065	5343523	5345982	5348440	Cosine. Cotang.	
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Cosine.	.8321155	·8319541	8317927	.8316312	8314696	.8313080	8311463	8309845	8308226	8306607	8304987	8303366	8301745	8300123	8298500	8296877	8295252	8293628	-8292002	8290376		Sine.	Deg. 56.
Tang. Cotang.	1.500382	1-499436	1-498492	1-497548	1-496605	1-495663	1-494722	1-493782	1492842	1-491903	1-490965	1-490028	1.489092	1-488157	1.487222	1-486288	1-485355	1.484423	1.483491	1-482561		Tang.	
Tang.	.666496	6666917	667337	667758	·668178	.668599	.669020	669441	669863	670284	670706	.671128	.671550	.671972	.672394	.672816	.673239	.673662	$\cdot 674085$	·674508		Cotang.	
Sine.	5546024	5548444	5550864	5553283	5555702	5558121	5560539	5562956	5565373	5567790	5570206	5572621	5575036	5577451	5579865	5582279	5584692	5587105	5589517	5591929		/ / Cosine. Cotang.	
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	8353279	8351680	-8350080	8348479	8346877	.8345275	-8343672	-83 12068	8340463	8338858	8337252	8335646	8334038	8332430	8330822	·8329212	.8327602	8325991	8324380	8322769		Sine.	Deg. 56.
Tang. Cotang. Cosine.	1.519463	1.518501	1.517540	1-516579	1-515620	1.514661	1.513703	1.512746	1.511790	1.510835	1.509880	1.508927	1.507974	1.507022	1.506071	1.505121	1.504171	1.503222	1.502275	1.501328		Tang.	
Tang.	.658127	·658544	·658961	·659378	·659796	•660213	-660631	·661049	·661467	·661885	·662304	.6627222	-663141	·663560	·663979	·664398	·664817	.665237	·665657	.6666076		Cotang.	
Sine.	-5497520	-5499950	·5502379	.5504807	.5507236	•5509663	•5512091	-5514518	-5516944	.5519370	.5521795	.5524220	-5526645	.5529069	-5531492	.5533915	·5536338	.5538760	·5541182	.5543603		// Cosine. Cotang.	
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Cosine.	0 • 5446390 • 649407 1 • 539865 • 8386706 60 21 • 5497520 • 658127 1 • 519463 • 8353279 39 41 • 5546024 • 666496 1 • 500382 • 8321155 19	$\circ 544830 \circ 649821 1 \cdot 538884 \circ 8385121 59 22 \circ 5499950 \circ 658544 1 \cdot 518501 \cdot 8351680 38 42 \cdot 5548444 \cdot 666917 1 \cdot 499436 \circ 8319541 \cdot 5548845 \cdot 68166917 1 \cdot 499436 \cdot 6819541 \cdot 681666 \cdot 6816666 \cdot 68166666 \cdot 6816666 \cdot 6816666 \cdot 68166666 \cdot 681666666 \cdot 68166666 \cdot 68166666 \cdot 68166666 \cdot 68166666 \cdot 68166666 \cdot 681666666 \cdot 681666666 \cdot 681666666 \cdot 681666666 \cdot 6816666666 \cdot 68166666666 \cdot 6816666666666 \cdot 68166666666666666666666 \cdot 6816666666666666666666666666666666666$	$\bullet 5451269 \cdot 650235 [1 \cdot 537905 \cdot 8383536 58 23 \cdot 5502379 \cdot 658961 1 \cdot 517540 \cdot 8350080 37 43 \cdot 5550864 \cdot 667337 1 \cdot 498492 \cdot 8317927 17 17 17 18 18 18 18 1$	$3 \cdot 6453707 \cdot 650649 \\ 1 \cdot 536927 \cdot 8381950 \\ 5724 \cdot 5504807 \cdot 659378 \\ 1 \cdot 516579 \cdot 8348479 \\ 36 \\ 14 \cdot 5553233 \\ 657758 \\ 1 \cdot 497548 \\ 8316312 \\ 16 \cdot 5553233 \\ 17 \cdot 555323 \\ 17 \cdot 5553233 \\ 10 \cdot 555323 \\ 17 \cdot 555323 \\ 17 \cdot 5553233 \\ 17 \cdot 555323 \\ 17 \cdot 5$	$4 \cdot 5456145 \cdot 651063 \\ 1 \cdot 535949 \cdot 8380363 \\ 5623 \cdot 5507236 \cdot 659796 \\ 1 \cdot 515620 \cdot 8346877 \\ 3545 \cdot 5555702 \\ \cdot 658178 \\ 1 \cdot 496605 \\ \cdot 8314696 \\ 1 \cdot 51562 \\ \cdot 5555702 \\ \cdot 55575702 \\ \cdot$	$\circ 5458533 \\ \circ 651477 \\ 1 \\ \circ 534972 \\ \circ 8378775 \\ \circ 538775 \\ \circ 539663 \\ \circ 650263 \\ \circ 650213 \\ \circ 1 \\ \circ 514661 \\ \circ 8345275 \\ \circ 34166 \\ \circ 5558121 \\ \circ 665599 \\ \circ 1 \\ \circ 495663 \\ \circ 8313080 \\$	$ \cdot 5461020 (\cdot 651891 1 \cdot 533996 \cdot 8377187 54 27 (\cdot 551 \\ 2091 \cdot 660631 \cdot 513703 \cdot 8343672 \cdot 3347 \cdot 5560539 \cdot 669020 \cdot 494722 \cdot 8311463 \cdot 13463 $	$7 \cdot 5463456 \cdot 652306 \left[1 \cdot 533021 \cdot 8375598 \left[5328 \cdot 5514518 \right] \cdot 661049 \left[1 \cdot 512746 \right] \cdot 8342068 \left] 3248 \right] \cdot 5552956 \cdot 669441 \left[1 \cdot 493782 \cdot 8309845 \right] 1282 \cdot 8309845 \left[1282 \cdot 8305 \right] 1282 \cdot 8305 \cdot $	$8^{+}_{0} 6465892^{+}_{0} 652721^{+}_{0} 1\cdot 532047^{+}_{0} 8374009^{+}_{0} 5516944^{+}_{0} 661467^{+}_{1} 1\cdot 511790^{+}_{0} 8340463^{+}_{0} 31^{+}_{1} 49^{+}_{0} 5565373^{+}_{0} 669863^{+}_{0} 1\cdot 492842^{+}_{0} 8308226^{+}_{1} 1\cdot 525673^{+}_{1} 1\cdot 5256757557575757575757575757575757575757$	$9 \cdot 5468328 \cdot 653136 \left[1 \cdot 531074 \cdot 8372418 \left[51\right] 30 \cdot 5519370 \cdot 661885 \left[1 \cdot 510335 \cdot 8338858 \right] 30 \left[50 \cdot 5567790 \right] \cdot 670284 \left[1 \cdot 491903 \cdot 8306607 \right] - 6806607 \cdot 680607 \cdot 6806607 \cdot 680607 \cdot 680607 \cdot 6806607 \cdot 6806607 \cdot 680607 \cdot 680607 \cdot 68$	$0 \cdot 5470763 \cdot 653551 \\ 1 \cdot 530102 \cdot 8370827 \\ 5031 \cdot 5521795 \cdot 662304 \\ 1 \cdot 509880 \cdot 8337252 \\ 2051 \\ 1 \cdot 570206 \\ 1 \cdot 670706 \\ 1 \cdot 490965 \cdot 8304987 \\ 2051 \\ 205$	$1^{+}5473198^{+}6539661^{+}529130^{+}83692364932^{+}5524220^{+}6627221^{+}508927^{+}8335646^{+}28^{+}5275621^{+}671128^{+}1^{-}490028^{+}8303366^{-}671128^{+}1^{-}490028^{+}8303366^{+}6711^{+}6711^{+}671$	$2^{+}5475632^{+}654381^{+}1 \cdot 528160^{+}8367643^{+}8^{+}33^{+}5526645^{+}663141^{+}1 \cdot 507974^{+}8334038^{+}27^{+}53^{+}5575036^{+}671550^{+}1 \cdot 489092^{+}8301745^{+}6324038^{+}27^{+}537636^{+}671550^{+}1 \cdot 489092^{+}8301745^{+}1 \cdot 50797^{+}8334038^{+}27^{+}53^{+}1 \cdot 50786^{+}1 \cdot 50786^{+$	$3^{+}5478066 + 654797 \\ 1 + 527190 + 8366050 \\ 4 + 34 + 5529069 + 663560 \\ 1 + 507022 + 8332430 \\ 26554 + 5577451 + 671972 \\ 1 + 48157 \\ 1 + 88157 \\ 1 + 8300123 \\ 1 + 507022 \\ 1 + 50702$	$14 \cdot 5480499 \cdot 655212 \cdot 526221 \cdot 8364456 \cdot 46 \cdot 3531492 \cdot 663379 \cdot 1506071 \cdot 8330822 \cdot 25579865 \cdot 672394 \cdot 1248722 \cdot 8298500 \cdot 1248 \cdot$	$5 \cdot 5428232 \cdot 655628 \cdot 552523 \cdot 8362862 \cdot 45 \cdot 36 \cdot 5533915 \cdot 664398 \cdot 1505121 \cdot 5329212 \cdot 24 \cdot 56 \cdot 5582279 \cdot 672816 \cdot 1486288 \cdot 8296877 \cdot 5582279 \cdot 5582779 \cdot 558779 \cdot 55879 \cdot 558779 \cdot 558779 \cdot 558779 \cdot 558779 \cdot 558779 \cdot 558779 $	$6 \begin{bmatrix} 5485365 \\ 656044 \\ 1 \\ 524286 \\ 8361266 \\ 44877 \\ 5536338 \\ 664817 \\ 1 \\ 504171 \\ 8327602 \\ 2357 \\ 602 \\ 2357 \\ 602 \\ 2357 \\ 653239 \\ 1 \\ 483255 \\ 82355 \\ 8235555 \\ 8235555 \\ 8235555 \\ 8235555 \\ 8235555 \\ 82355555 \\ 823555555 \\ 8235555555 \\ 823555555555555555555555555555555555555$	$ [7.5487797] \bullet 656460 \\ 1 \cdot 523320 \\ \bullet 8359670 \\ \bullet 4338 \\ \bullet 5538760 \\ \bullet 665227 \\ \bullet 1 \cdot 503222 \\ \bullet 8325991 \\ \bullet 2258 \\ \bullet 5258 \\ \bullet 105 \\ \bullet 673662 \\ \bullet 1 \cdot 484423 \\ \bullet 8293628 \\ \bullet 8293628 \\ \bullet 8292991 \\ \bullet 8292991 \\ \bullet 8292991 \\ \bullet 82929 \\ \bullet 8292991 \\ \bullet 829291 \\ \bullet 829$	$18.5490228^{1} 656877 \\ 1\cdot 522354 \cdot 8358074 \cdot 4239 \cdot 5541182 \cdot 665657 \\ 1\cdot 502275 \cdot 8324380 \\ 21 \cdot 59245 \cdot 589210 \\ 21 \cdot 583491 \cdot 823491 \cdot 8292002 \\ 21 \cdot 83491 \cdot 8292002 \\ 32 \cdot 5589517 \cdot 674085 \\ 32 \cdot 5589517 + 6740855 \\ 32 \cdot 5589517 + 67408555 \\ 32 \cdot 5589517 + 674085555 \\ 32 \cdot 5589517 + 674085555 \\ 32 \cdot 5589517 + 674085555 \\ 32 \cdot 55895557 \\ 32 \cdot 558957 + 6740855555 \\ 32 \cdot 5589557 + 674055555555 \\ 32 \cdot 5585555555 \\ 32 \cdot 5589555555555555555555555555555555555$	$ 10^{-5492659} \cdot 657293 \\ 1 \cdot 521389 \\ \cdot 8325476 \\ 1 \cdot 140 \\ \cdot 543603 \\ \cdot 666076 \\ 1 \cdot 501328 \\ \cdot 832276 \\ \cdot 832276 \\ \cdot 822276 \\ \cdot 8261 $	20 -5495090 -657710 1-520426 -8354878 40	Sine.	Deg. 56.
Tang. Cotang. Cosine.	1-539865	1.538884	1.537905	1.536927	1.535949	1-534972	1.533996	1.533021	1.532047	1.531074	1.530102	1-529130	1.528160	1.527190	1.526221	1-525253	1.524286	1.523320	1.522354	1.521389	1.520426	Tang.	
Tang.	.649407	649821	.650235	.650649	.651063	651477	.651891	.652306	.652721	·653136	-653551	-653966	.654381	·654797	.655212	•655628	·656044	·656460	-656877	-657293	.657710	Cotang.	
Sine.	-5446390	-5448830	.5451269	-5453707	-5456145	5458583	-5461020	•5463456	-5465892	-5468328	•5470763	•5473198	•5475632	-5478066	•5480499	-5482932	-5485365	-5487797	.5490228	.5492659	.5495090	/ Cosine. Cotang.	
-	0	1	65	3	4	5	9	2	00	6	10	11	12	13	14	15	16	17	18	19	20	-	

-	1	19	18	17	16	15	14	13	12	11	10	6	00	2	9	5	4	3	63	1	0		-
Cosine.		.8223096	.8221440	·8219784	-8218127	.8216469	-8214811	-8213152	·8211492	-8209832	-8208170	-8206509	·8204846	-8203183	·8201519	·8199854	68186181	·8196523	.8194856	·8193189	-8191520		Sine.
Cotang.		1.445081	1.444183	1.443286	1.442389	1-441494	1-440599	1-439704	1.438811	1-437918	1.437026	1-436135	1-435245	1-434355	1-433466	1-432578	1-431690	1.430803	1.429917	1.429032	1.428148	Î	Tang.
Tang.		-692002	692432	.692863	.693293	·693724	·694155	·694586	·695018	.695449	188269.	·696313	·696745	121269.	609469.	.698042	·698474	106869-	•699340	·699774	-702007		Cotang.
Sine.		·5690403	·5692795	-5695187	-5697577	·5699968	-5702357	-5704747	-5707136	-5709524	-5711912	.5714299	·5716686	-5719073	-5721459	-5723844	-5726229	.5728614	-5730998	-5733381	-5735764		// Cosine. Cotang.
11,	-	3941	3842	3743	36 44	35 4.5	34 46	3347	32 48	3149	30 50	29 51	28 52	2753	26 54	25 55	24 56	23 57	22 58	21 59	20 60		1-
Cosine. ' '		8256062	.8254420	8252778	8251135	8249491	.8247847	-8246202	8244556	8242909	8241262	-8239614	-8237965	8236316	8234666	8233015	8231364	-8229712	8228059	8226405	8224751		Sine.
Cotang.		1-463200	1-462287	1-461374	1-460463	1-459552	1-458642	1-457732	1-456824	1.455916	1.455009	1-454102	1-453197	1-452292	1-451388	1-450485	1-449582	1-448680	1-447779	1-446879	1.445980		Tang.
Tang.		·683433	-683860	.684287	·684714	·685141	·685569	.685996	·686424	-686852	·687281	602780.	.688137	.688566	688995	·689424	·689853	-690283	-690712	-691142	.691572		Cotang.
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Cosine.	FORMORED FORMATION FOR FORMATION FO	0011000	0100100	110100100 0010101 1 (2001). (COC LG. (C1 / 0100000.) (C1 / 02.1 171000.) (A1 / 02.1 171000.) (C1 / 02.1 1710000.) (C1 / 02.1 171000.) (C1 / 02.1 1710000.) (C1 / 02.1	$. 584910 \cdot 727876 [1 \cdot 373859 \cdot 8085037 [5724 \cdot 5934189 \cdot 737263]1 \cdot 356367 \cdot 8048938 [3644 \cdot 5980915 \cdot 746282 \\1 \cdot 339975 \cdot 8014278 \\1 \cdot 6920 \cdot 1278 \cdot 1692 \cdot 1292 \cdot 1$.5887262 (728321 1.373019 (86833225 56 25 (5336530 (737712 1.355541 8047211 35 45 5983246 746735 1.339162 8012538 15	$\frac{5889613}{5889613}, \frac{78767}{58260}, \frac{1}{8}081612, \frac{5526}{5}, \frac{5938971}{5}, \frac{738162}{5}, \frac{1}{5}, \frac{564716}{6}, \frac{8045484}{5}, \frac{3446}{5}, \frac{5985577}{7}, \frac{747188}{1}, \frac{1}{3}, \frac{338350}{5}, \frac{8010797}{1}, \frac{1}{5}, \frac{1}{5$	$-589164\cdot\cdot\cdot 592121\cdot\cdot 371342\cdot 80798995427\cdot\cdot 5941244\cdot\cdot\cdot 386111\cdot\cdot 353891\cdot\cdot 8043756 33 47\cdot\cdot 5987906\cdot\cdot 747642 1\cdot\cdot 337538\cdot\cdot 8009056 13 1\cdot\cdot 32134\cdot\cdot 3214\cdot\cdot 3$	$-5894314, -729658 \left[1 \cdot 370504, 8078185 \left[5328, -5943550 \right] \cdot 739065 \left[1 \cdot 353068 \cdot 8042028 \right] \cdot 328948 \left[\cdot 5990236 \right] \cdot 748095 \left[1 \cdot 336727 \right] \cdot 5007314 \left[12 \cdot 3290236 \right] \cdot 12805 \left[1 \cdot 3267 \right] \cdot 1280$	$- \frac{3696665}{369667} + \frac{369667}{369667} + \frac{8076470}{8076470} = \frac{5945889}{5229} + \frac{3053211}{325244} + \frac{3040299}{32046} = \frac{3149}{592565} + \frac{325947}{745549} + \frac{335517}{325917} + \frac{3696667}{325917} + \frac{369667}{325917} + \frac{369667}{32597} + \frac{36967}{32597} + \frac{36967}{32597} + \frac{36967}{32597} + \frac{36967}{32597} + \frac{369667}{32597} + \frac{36967}{32597} + \frac{36967}{32597} + \frac{36967}{32597} + \frac{36967}{32597} + \frac{369667}{32597} + \frac{369667}{32597} + \frac{369667}{32597} + \frac{36967}{32597} + \frac{369667}{32597} + \frac{36967}{32597} + \frac{36967}{3257} + \frac{36967}{3257} + \frac{36967}{3257} + \frac{36967}{3257} + $	$0.\frac{5899019}{589019}, \frac{730550}{530}, \frac{1368831}{530}, \frac{8074754}{51}, \frac{50}{51}, \frac{50948328}{50}, \frac{739961}{53}, \frac{1}{535}, \frac{1}{52}, \frac{1}{50}, \frac{1}{55}, \frac{1}{59},	-8002083	-8000338	-7998593	7996847	•7995100	.7993352	·7991604	-7989855	-7988105	7986355		Sine.	Deg. 53.
Cotang. Cosine.	1.342417	1.341602	004076-1	001050.T	1.339975	1.339162	1.338350	1-337538	1-336727	1.335917	1.335107	$0.5601361 \cdot 7309961 \cdot 387995 \cdot 8073038 50031 \cdot 5950566 \cdot 740411 1 \cdot 350600 \cdot 8036338 2951 \cdot 749457 1 \cdot 334298 \cdot 8002083 \cdot 2002083 \cdot 200208 \cdot 2$	$1.5903709 \\ -731442 \\ 1.367161 \\ -8071321 \\ -8071321 \\ -5952904 \\ -740861 \\ 1.349779 \\ -8035107 \\ -8035107 \\ -8035107 \\ -809549 \\ -749911 \\ 1.333490 \\ -8000338 \\ -800038 \\ -8000338 \\ -8000338 \\ -8000338 \\ -8000$	2.50605717731889 1.3665356 8069603 4833 5955241 741312 1.348958 8033375 2753 6001876 750366 1.332682 7798563	$3 \cdot 5008404 \cdot 732336 \left[1 \cdot 365493 \cdot 8067885 \right] 47 \left[34 \cdot 5957577 \cdot 741763 \right] \cdot 348139 \cdot 8031642 \left[2654 \cdot 6004202 \right] \cdot 750821 \left[1 \cdot 331875 \right] \cdot 7996847 \cdot 796847 \cdot 79687 \cdot 796847 \cdot 79687 \cdot 7967 \cdot 79687 \cdot 79687 \cdot 79687 \cdot 79687 \cdot 796877 \cdot 79687 \cdot 796$	$4 \cdot 59 \cdot 0750 \cdot 732783 \\ 1 \cdot 364660 \cdot 8066166 \cdot 46 \\ 35 \cdot 5959913 \cdot 742214 \\ 1 \cdot 347319 \cdot 8029909 \\ 25 \\ 55 \cdot 6006528 \\ 751276 \\ 1 \cdot 331068 \\ 7531068 \\ 75056 \\ 1 \cdot 347319 \\$	$5.5913096 \cdot 733230 1\cdot 363827 \cdot 8064446 4536 \cdot 5962249 \cdot 742665 1 \cdot 34650 1 \cdot 8028175 \cdot 2456 \cdot 6008854 \cdot 751731 1 \cdot 330262 \cdot 7993352 \cdot 7993352 \cdot 751731 \cdot 7$	$6.5915442 \cdot 733677 1\cdot 362996 \cdot 8062726 4437 \cdot 5964584 \cdot 743117 1\cdot 345683 \cdot 8026440 23 57 \cdot 6011179 \cdot 752186 1\cdot 323457 \cdot 7931604 \cdot 123657 \cdot 7931607 \cdot 123657 \cdot 7931604 \cdot 123657 \cdot$	$7.5917787/ \cdot 7341251 \cdot 362165 \cdot 80610054338 \cdot 5966918 \cdot 743568 1 \cdot 344865 \cdot 8024705 \\ 2258 \cdot 6013503 \cdot 752642 1 \cdot 328652 \cdot 7989855 \cdot 79866 \cdot 8024705 \cdot 802705 \cdot 8$	8.5520132 -734573 1.361335 8059283 42 39 5969252 -744020 1.344049 8022969 21 59 6015827 -753098 1.327848 -7988105	$9^{+}5922476^{+}735021^{+}360505^{+}8057560^{+}140^{+}5971586^{+}744472^{+}1.343233^{+}8021232^{+}20^{-}60^{+}6018150^{+}753554^{+}1.327044^{+}7986356^{+}1.237044^{+}7986356^{+}1.237044^{+}7986356^{+}1.237044^{+}7986356^{+}1.237044^{+}7986356^{+}1.23704^{+}1.23666^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.237066^{+}1.2366^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.23666^{+}1.2366^$		Tang.	
Tang.	.744924	775377	000014	670041	.746282	•746735	.747188	-747642	.748095	-748549	.749003	.749457	749911	.750366	.750821	.751276	167131	.752186	.752642	•753098	.753554		Cotang.	
Sine.	6168269	1969265	10202000	0000160	2160869	5983246	5985577	5987906	5990236	5992565	5994893	5997221	5999549	9281009	6004202	6006528	6008854	6211109	6013503	6015827	6018150		/ Cosine. Cotang.	
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Cotang.	1.358848	0400001	0*000001	1.991/193	1.356367	1.355541	1.354716	1.353891	1.353068	1.352244	1.351422	1-350600	1-349779	1-348958	1-348139	1-347319	I-346501	1.345683	1.344865	1.344049	1.343233		Tang.	
Tang.	735917	236364	anenet.	112021.	.737263	.737712	-738162	.738611	490667	.739511	196662	740411	-740861	.741312	-741763	.742214	.742665	743117	.743568	.744020	.744472		Cotang.	
Sine.	5997163	5090505	2000000	1.181266.	5934189	5936530	5938971	5941211	5943550	5945889	5948228	5950566	5952904	5955241	5957577	5959913	5962249	5964584	5966918	5969252	-5971586		Cosine. Cotang.	and the second
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Cosine.	0210008	0110000	00120000	-8086749	·8085037	·8683325	8081612	6686208	-8078185	.8076470	·8074754	-8073038	·8071321	·8069603	·8067885	·8066166	·8064446	8062726	-8061005	8059283	-8057560	-8055837	Sine.	Deg. 53.
Cotang.	196946-1	TOCOTO-I	05cere.T	1-374699	1.373859	1.373019	1.372180	1.371342	1.370504	1-369667	1-368831	1.367995	1.367161	1.366336	1-365493	1.364660	1-363827	1.362996	1-362165	1-361335	1.360505	20 -5924819 -735469 1-359676 -8055837 40	Tang.	
Tang.	MOCE 40	240021	106021.	.727431	.727876	.728321	.728767	.729212	.729658	-730104	730550	966082.	-731442	.731889	.732336	.732783	-733230	7733677	-734125	-734573	.735021	.735469	Cotang.	
Sine.	C TOMMO Z	0001100	0020990	5882558	5884910	5887262	5889613	5891964	5894314	5896663	5899012	1961065	6076066	5906057	5908404	5910750	5913096	5915442	7877192	5920132	5922476	5924819	Cosine. Cotang.	
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Cotane.	0.6018150 753554 1.327044 79863555 60 1.6020473 754406 1.3254434 27984365 60 1.6020473 754406 1.325434 27984365 60 2.6022197 755454 1.325434 27984505 56 3.6025117 7554923 1.325453 7982555 56 5.60229760 7555379 1.325453 77931005 57 5.60229760 7555379 1.3221437 7797593455 56 6.60230760 7555379 1.320437 77974084 55 6.60330038 75757209 1.320437 779763845 56 10 6041356 7557409 1.320437 77956394 56 11 6043357 759329532 133841 77970572 51 11 6043367 755838 1.317451 7955294 46 12<6045393	Tang.	
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Cosine.	.7806123	-7804304	7802485	-7800665	-7798845	·7797024	-7795202	0826677	-7791557	·7789733	6062822	·7786084	-7784258	-7782431	·7780604	LLL8LLL.	-7776949	0212775	.7773290	-7771460		Sine.	Deg. 51
Tang. Cotang.	1-248948	1-248204	1.247460	1-246716	1.245974	1-245232	1-244490	1.243749	1.243008	1.242268	1-241529	1-240790	1-240051	11-239313	1.238576	1-237839	1-237103	1.236367	1-235631	1-234897	T	Tang.	
Tang.	-800673	·801151	·801628	·802106	·802584	-803063	·803541	-804020	·804499	·804979	805458	-805938	·\$06418	·806898	-807378	-807859	1-808340	808821	1-809302	-809784		Cotang.	
Sine.	.6250156	·6252427	·62:54696	·6256966	6259235	·6261503	-6263771	·6266038	·6268305	.6270571	6272837	-6275102	.6277366	·6279631	-6281894	6284157	·6286420	-6288682	·6290945	-6293204		/ / Cosine. Cotang.	
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Tang. Cotang. Cosine.	1-263950	1-263195	1-262440	1.261686	1.260932	1.260179	1-259426	1-258674	1.257923	1-257172	1-256421	1-255672	1-254922	1.254174	1.253426	1.252678	1.251931	1.251184	1.250438	1-249693		Tang.	bitation L
'Iang.	021167.	$\cdot 791643$.792116	.792590	·793064	-793537	.794012	-794486	·794961	1-795435	.795911	.796386	·796861	797337	-797813	.798289	·798765	.799242	612662	·800196		Cotang.	all as
Sine.	-6204636	6206917	·6209198	·6211478	-6213757	·6216036	·6218314	·6220592	.6222870	-6225146	.6227423	.6229698	·6231974	6234248	6236522	6238796	6241069	·6243342	·6245614	-6247885		/ Cosine. Cotang.	- ANARA
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Cotang.	1-279941	1-279174	1-278407	1-277641	1-276876	1.276111	1-275347	1-274583	1-273820	1-273057	1-272295	1.271534	1.270773	1.270013	1-269253	1-268494	1-267735	1-266977	1-266219	1-265462	1-264706	Tang.	
Tang.	-781285	·781754	.782222	.782691	191887.	.783630	.784100	·784570	·785040	.785510	.785980	-786451	-786922	-787393	·787864	.788336	·788809	-789280	.789752	-790224	169061.	Cotang.	
Sine.	·6156615	1068919.	·6161198	•6163489	•6165780	6908919-	6170359	6172648	6174936	·6177224	1126/19-	8611819.	·6184084	0289819.	6188655	6260619-	-6193224	6195507	0627910-	6200073	-6202355	Cosine. Cotang.	
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Cotang.	1.205219	1-204505	1-203793	1.203081	$1 \cdot 202369$	1.201658	$1 \cdot 200947$	1.200237	1.199527	1.198818	1.198109	1.197401	1.196693	1.195986	1.195279	1.194573	1.193867	$1 \cdot 193162$	1.192457	1.191753		Tang.	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Tang.	.829724	$\cdot 830216$	830707	·831199	·831691	.832183	.832675	·833168	·\$33661	·834154	·834648	.835141	.835635	.836129	·836624	.837118	•837613	·838108	·838604	·839099		Cotang.	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Sine.	6385440	6387678	6389916	6392153	6394390	6396626	6398862	6401097	6403332	6405566	6407799	6410032	6412264	6414496	6416728	6418958	6421189	6423418	6425647	6427876		Cosine.	
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$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Cotang.	1.219588	1.218865	1.218142	1.217419	1.216698	1.215976	1.215256	1-214535	1-213816	1-213097	1.212378	1-211660	1.210942	1-210225	1.209508	1.208792	1-208076	1.207361	1-206646	$1 \cdot 205932$		Tang.	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Tang.	.819948	.820435	820922	.821409	.821896	.822384	.822871	823359	.823847	·824336	824825	.825314	825803	.826292	·826782	.827271	-827762	.828252	.828742	.829233		Cotang.	
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· · · · · · · · · · · · · · · · · · ·		6293204	6295464	6297724	6299983	6302242	6304500	6306758	6309015	6311272	6313528	6315784	6318039	6320293	6322547	6324800	6327053	6329306	6331557	6333809	6336059	6338310	Cosine.	
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Cosine.	100031.1	TEXPOLT	100201.1	1.101923	1.161240	1.160557	$0.439011 \\ 0.41581 \\ 1.188239 \\ 0.7651087 \\ 15526 \\ 0.6485628 \\ 0.852070 \\ 1.173612 \\ 0.7611611 \\ 0.446 \\ 0.6529801 \\ 0.862162 \\ 1.159874 \\ 0.7573751 \\ 0.75757512 \\ 0.75757$	0441236 842078 1 187538 7649214 5427 6487842 852572 1 172920 7609724 3347 6532004 862669 1 159192 7571851	-6443461 + 842576 + 186337 + 7647340 + 6328 + 6490056 + 853075 + 172229 + 7607837 + 3248 + 6534206 + 863176 + 158511 + 7569951 + 75695661 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 75695661 + 7569561 + 7569561 + 7569561 + 7569561 + 7569561 + 75695661 + 75695661 + 75695661 + 75695661 + 756956661 + 75695666661 + 756956666666666666666666666666666666666	-6445685 + 843073 + 186136 + 7645465 + 52 + 29 + 6492268 + 853577 + 1 + 171539 + 7605949 + 31 + 49 + 6536408 + 863684 + 1 + 57830 + 7568050 + 644568 + 500000 + 500000 + 500000 + 500000 + 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6560590 \\ + 860286 \\ + 7.16388 \\ + 7547096 \\ + 7585136 \\ + 2066 \\ + 860286 \\ + 10^{-} \cdot 126368 \\ + 7587 \\ + 7586 \\ + 10^{-} \cdot 12636 \\ + 10^$			Tang.
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Sine.	.6518779	010100	10010030	6210200	•6525394	.6527598	6529801	·6532004	.6534206	.6536408	.6538609	.6540810	.6543010	.6545209	.6547408	·6549607	·6551804	.6554002	.6556198	.6558395	.6560590			/ / Cosine. Cotang.
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Cosine.	7691036	7610159	2010101	0071101	ESECTOL.	-7613497	.7611611	.7609724	76870837	7605949	.7604060	.7602170	.7600280	.7598389	.7596498	-7594606	.7592713	7590820	·75S8926	1507837	.7585136			Sine.
Cotang.	1.177075	0020111	1.175699	0000111	9665/1.1	1.174303	1.173612	1.172920	1-172229	1.171539	1.170849	1.170160	1.169471	1.168782	1.168094	1.167407	1.166720	$1 \cdot 166033$	1.165347	1.164661	1.163976			Tang.
Tang.	.849563	.850064	202020	000120	000102.	851568	·852070	.852572	·853075	.853577	·854080	-854583	180558.	.855591	.856095	-856599	-857103	.857608	-858113	.858618	·859124			Cotang.
Sine.	.6474551	-6476767	1208718.	10011013	RATIOTO.	·6483414	•6485628	·6487842	·6490056	•6492268	·6494480	-6496692	·6498903	-6501114	·6503324	·6505533	·6507742	·6509951	.6512158	·6514366	.6516572			/1/ Cosine. Cotang. Tang.
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Cosine.	.7660444	.7658574	-7656704	0601397	2004001.	0962697.	.7651087	.7649214	.7647340	•7645465	·7643590	·7641714	.7639838	.7637960	·7636082	•7634204	•7632325	•7630445	·7628564	•7626683	.7624802	.7622919		Sine.
Tang. Cotang. Cosine.	1.191753	1.191049	1 190346	01000111	CHOCOL L	1.188941	1.188239	1.187538	1.186837	1.186136	1.185437	1.184737	1.184038	1.183340	1-182642	1.181944	1.181247	1.180551	1.179855	1.179159	1.178464	1.177769		Tang.
Tang.	-839099	.839595	1.840091	793019.	1000100	541084	-841581	.842078	.842575	-843073	.843570	·844068	·844567	.845065	-845564	·846063	-846562	-847062	.847561	·848061	.848561	-849062		Cotang.
Sine.	.6427876	·6430104							•6443461	•6445685	·6447909	.6450132	•6452355	.6454577	•6456798	.6459019	•6461240	•6463460	-6465679	-6467898	-6470116	20 6472334 849062 1.177769 7622919 40		/ Cosine. Cotang. Tang.
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Cosine.	-7468317	·7466382	•7464446	.7462510	·7460574	.7458636	•7456699	.7454760	.7452821	-7450881	-7448941	•7446999	-7445058	-7443115	-7441173	•7439229	.7437285	7435340	.7433394	•7431448	-NITE -	Sine.
Tang. Cotang.	1.123032	1-122375	1-121718	1.121061	$1 \cdot 120405$	1.119749	1.119094	1.118439	1.117784	1-117130	1-116476	1-115823	1.115170	1.114518	$1 \cdot 126987 \cdot 7479912 \cdot 2555 \cdot 6680490 \cdot 897773 \cdot 113866 \cdot 7441173$	1.113214	$1 \cdot 112563$	1.111912	1.111262	1.110612		Tang.
Tang.	.890445	7990967	·891489	.892011	·892534	.893056	.893579	894103	.894626	·895150	·895674	·896199	·996723	·897248	·897773	.898299	· 898825	.899351	77899877	·900404		Cotang.
Sine.	6650131	6652304	6654475	66556646	6658817	66660987	66663156	6665325	6667493	66669661	6671828	6673994	·6676160	6678326	6680490	6682655	·6684818	6686981	·6689144	6691306		/ / Cosine. Cotang.
~	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60		~
~	39	38	37	36	35	34	33	32	31	30	29	28	27	26	2.5	24	23	22	21	20		~
Cosine.	7506879	7504957	7503034	7501111	7499187	7497262	7495337	7493411	7491484	7489557	7487629	7485701	-7483772	-7481842	7479912	.7477981	.7476049	7474117	·7472184	.7470251		Sine.
Tang. Cotang. Cosine.	-65605 00 -869286 1-150368 -7547096 6021 -6606570 -880069 1-136274 -7506879 3941 -6650131 -890445 1-123032 -7468317 19	$\bullet 6562785 \cdot 869797^{1} \cdot 149692 \cdot 7545187 \\ 5922 \cdot 6608754 \cdot 880585 \\ 1 \cdot 135608 \cdot 7504957 \\ 1 \cdot 880585 \\ 1 \cdot 125504 \\ 1 \cdot 125275 \\ 1 \cdot 125275 \\ 1 \cdot 125506 \\ 1$	$\bullet 564980 \cdot 870308 \left[1 \cdot 143017 \cdot 7543278 \right] \\ \bullet 5823 \cdot 6610936 \cdot 881101 \left[1 \cdot 134942 \cdot 7503034 \right] \\ 3743 \cdot 6554475 \cdot 891489 \left[1 \cdot 121718 \cdot 7464446 \right] \\ \bullet 581437 \cdot 891489 \cdot $	$ \bullet 567174 \cdot \bullet 70820 1 \cdot 148342 \cdot 7541368 57244 \cdot 6613119 \cdot 881618 1 \cdot 134277 \cdot 7501111 3644 \cdot 6656646 \cdot 892011 1 \cdot 121061 \cdot 7462510 \cdot 7462500 \cdot 7462500 \cdot 7462510 \cdot 7462500 \cdot 7462500 \cdot 74600 \cdot 746000 \cdot 74600 \cdot 74600 \cdot 74600 \cdot 74600 \cdot 74600 \cdot 74600 \cdot$	$\bullet 569367 \cdot 871331 \cdot 147668 \cdot 7539457 \cdot 5625 \cdot 6615300 \cdot 882135 \cdot \mathbf{1\cdot 133612} \cdot 7499187 \cdot 3545 \cdot 6658817 \cdot 892534 \cdot \mathbf{1\cdot 120405} \cdot 7460574 \cdot 1220405 \cdot 122040$	•6571560 •871843 1 • 146994 • 7537546 55 26 •6617482 •882653 1 • 1 32947 • 7497262 34 46 •6660987 •893056 1 • 1 1 9749 • 7458636	6 573752 6 573752 6 573752 6 573752 6 57375 1 7 1 1 1 1 1 1 1 1 1 1	6575944.878681..1.	$\bullet \bullet $	$\bullet 6580326 \cdot 873893 \\ 1 \cdot 144304 \cdot 7529894 \\ 51 \\ 30 \cdot 6626200 \cdot 884725 \\ 1 \cdot 130294 \cdot 7489557 \\ 30 \\ 50 \\ 6669661 \cdot 895150 \\ 1 \cdot 117130 \cdot 7450881 \\ 1 \cdot 117130 \cdot 750881 \\ 1 \cdot 117130 + 117130 + 117130 + 117130 \\ 1 \cdot 117130 + 117130 + 117130 + 117130 + 117130 + 117130 + 117130 + 117130 +$	$(0.6582516) \cdot 874406 \\ 1.143632 \cdot 7527980 \\ 5031 \cdot 6628379 \\ \cdot 8628379 \\ \cdot 885244 \\ 1.129632 \cdot 7487629 \\ \cdot 2951 \cdot 6671828 \\ \cdot 895674 \\ 1.116476 \\ \cdot 7448941 \\ \cdot 7448941 \\ \cdot 7488629 \\ \cdot 748762 \\ \cdot 74862 \\ \cdot 748762 \\ \cdot 74$	$11 \cdot 6584706 \cdot 874920 \cdot 1.142961 \cdot 7526065 \cdot 4922 \cdot 6830557 \cdot 885763 \cdot 128970 \cdot 7485701 \cdot 2852 \cdot 6673994 \cdot 896199 \cdot 1.115823 \cdot 7446999 \cdot 126823 \cdot 7446999 \cdot 126823 \cdot 128623 \cdot \mathbf$	$12 \cdot 6586895 \cdot 875433 \cdot 1142290 \cdot 7524149 \cdot 4833 \cdot 6632734 \cdot 886282 \cdot 1122308 \cdot 7483772 \cdot 2753 \cdot 6576160 \cdot 996723 \cdot 1115170 \cdot 7445058 \cdot 745058 \cdot 7$	$13 \cdot 6589083 \cdot 875947 \cdot 1 \cdot 141620 \cdot 7522233 \cdot 4734 \cdot 6634910 \cdot 886801 \cdot 1 \cdot 127647 \cdot 7481842 \cdot 2654 \cdot 678326 \cdot 897248 \cdot 1 \cdot 114518 \cdot 7443115 \cdot 744315 \cdot 7443115 \cdot 7$	1.126987	$1 \cdot 126327 \cdot 7477981 \cdot 2456 \cdot 6682655 \cdot 898299 \cdot 1 \cdot 13214 \cdot 7439229$	$16 \cdot 6595645 \cdot 877491 1 \cdot 139612 \cdot 7516480 44 37 \cdot 6641437 \cdot 888361 1 \cdot 125667 \cdot 7476049 23 57 \cdot 6684818 \cdot 898825 1 \cdot 112563 \cdot 7437285 1 \cdot 12866 \cdot 748664 \cdot 7486664 \cdot 7486664 \cdot 7486664 \cdot 7486664 \cdot 7486664 \cdot 7486664 \cdot 7486666 \cdot 7486666 \cdot 7486666 \cdot 7486666 \cdot 7486666 \cdot 7486666 \cdot 74866666 \cdot 74866666 \cdot 748666666 \cdot 748666666 \cdot 74866666666666 \cdot 748666666666666666 \cdot 748666666666666666666666666666666666666$	$17.6597831 \cdot 978006 \\ 1 \cdot 138944 \\ 7514561 \\ 4338 \\ 643612 \cdot 888882 \\ 1 \cdot 125008 \\ 7474117 \\ 2258 \\ 6866981 \\ 899351 \\ 1 \cdot 111912 \\ 733540 \\ 747350 \\ 7474117 \\ 72566 \\ 7476 \\ 74$	$18^{-6600017} \cdot 878521 \\ 1^{-1}38276 \cdot 7512641 \\ 4239 \cdot 6645785 \cdot 889403 \\ 1^{-1}24349 \cdot 7472184 \\ 2^{-1}268 \cdot 9144 \cdot 899877 \\ 1^{-1}11262 \cdot 7433394 \\ 2^{-1}23349 \cdot 7472184 \\ 2^{-1}282 \cdot 7484 \\ 2^{-1}2$	$19 \cdot 6602302 \cdot 879037 \left[1 \cdot 137608 \right] \cdot 7510721 \left[41 \right] 40 \left[-6647959 \right] \cdot 889924 \left[1 \cdot 123690 \right] \cdot 7470251 \left[20 \left[60 \right] \cdot 669 \left[306 \right] \cdot 900404 \left[1 \cdot 110612 \right] \cdot 7431448 \left[1 \cdot 1060 \right] \cdot 743148 \left[1 \cdot 1060 \right] \cdot 74314$		Tang.
Tang.	880068	·880585	·881101	·881618	.882135	.882653	.883170	.883688	·884206	·884725	·885244	·885763	.886282	·886801	•887321	·887841	.8883361	.888883	·889403	·889924		Cotang.
Sine.	.6606570	·6608754	•6610936	·6613119	•6615300	·6617482	·6619662	-6621842	.6624022	-6626200	·6628379	·6630557	·6632734	.6634910	7807633	.6639262	.6641437	·6643612	.6645785	•6647959		/ / Cosine. Cotang. Tang.
-	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		-
-	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	-
Cosine.	.7547096	-7545187	.7543278	·7541368	.7539457	-7537546	.7535634	•7533721	-7531808	-7529894	-7527980	-7526065	-7524149	.752235	.7520316	-7518398	-7516480	-7514561	-7512641	-7510721	-7508800	Sine.
Cotang. Cosine.	1.150368	1.149692	1.149017	1-148342	1.147668	1.146994	1.146321	1.145648	1.144976	1.144304	1.143632	1.142961	$1 \cdot 142290$	1.141620	1.140950	1.140281	1.139612	1.138944	1.138276	1.137608	1.136941	Tang.
Tang.	.869286	767938	·870308	.870820	-871331	·871843	.872355	-872868	.873380	.873893	·874406	.874920	·875433	·875947	-876462	.876976	.877491	-878006	.878521	-879037	.879552	Cotang.
Sine.	6560590	6562785	.6564980	.6567174	·6569367	.6571560	·6573752	•6575944	.6578135	·6580326	.6582516	·6584706	6586895	.6589083	14 6591271 876462 1.140950 7520316 46 35 6637087 887321	$15 \cdot 6593458 \cdot 876976 \\ 1 \cdot 140281 \cdot 7518398 \\ 45 \\ 36 \cdot 6639262 \cdot 887841 \\ 1 \cdot 140281 \cdot 7518398 \\ 45 \\ 36 \cdot 6639262 \cdot 887841 \\ 1 \cdot 14028 \\ 1 \cdot 1402$.6595645	·6597831	6600017	-6602202	20 .6604386 .879552 1.136941 .7508800 40	/ Cosine. Cotang. Tang.
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Cotang. Cotang. 1-0836432 1-0836432 1-0836432 1-083455 1-083455 1-081162 1-081162 1-081162 1-073642 1-073642 1-075560 1-075561 1-0755620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-0756620 1-07766620 1-07766620 1-07766620 1-07766620 1-07766620 1-07766620 1-07766620 1-07766620 1-07766620 1-0775660 1-0775600 1-0775600 1-0775600 1-077560000000000000000000	Tang.	
Tang. Tang. 922773 922773 922373 9224390 924390 924390 9254776 9224776 9224776 9224776 9224776 9224776 9224776 9224776 9224776 9224776 9227777 9227777 9227777 9227777 9227777 9227777 9227777 9227777 9227777 9227777 9227777 92277777 92277777777 92277777777 9227777777777	Cotang.	
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Cotang. 1-097060 1-095779 1-095779 1-095779 1-095779 1-094500 1-094500 1-094500 1-093861 1-091308 1-091308 1-091308 1-091308 1-088762 1-088762 1-088762 1-088762 1-088762 1-088762 1-088762 1-088762 1-0865588 1-08555888 1-08555888 1-08555888 1-0855588 1-0855588 1-085558	Tang.	
Tang. 911526 912526 91252232 9125526 9135156 914192 914727 915796 915796 916361 916363 916383 916383 916383 916383 916386 919547 919547 919547 919547 920684 9220621	Cotang.	1.1.1.1
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Cosine. 7431448 7429562 7429566 74236566 74236566 7423658 7421780 7419758 7419758 74119758 74113905 74113905 74113905 74113905 74113905 74113905 74113905 74113905 74113905 74113905 74102020 77402181 7740225 774275 774275 774275 777775 777775 77775 77777575 777777	Sine.	Deg. 47.
Sine. Tang. Cotang. Costine. / 0 66691306 -900404 1:110612 7431448 60 1 66693368 -901458 1:109963 7423650 59 2 66993468 -901985 1:109314 7423655 56 3 669948 -901985 1:109365 742564 58 5 66903041 1:107369 -911365 56 57 55 6 6702108 903041 1:107369 7413755 56 57 <	Tang.	
Tang. 900404 900330 901458 90035030 901458 902513 901458 9035613 9036563 904097 90465155 9051555 9051555 9052635 9052635 9051555 9052635 905365 9052635 905325 905365 9052635 9053365 9053365 9053635 9053365 9053365 9053636 9053365 9053365 905395 9053365 9053365 905395 9053365 9053365 905395 9053365 9053365 905395 9053365 9053365 905395 9053365 9053365 905395 9053365 9053365 905365 9053365 9053365 905365 9053365 9053365 905365 9053365 9053365 905365 9053365 9053365 905365 905365 9053655 9055555 90	Cotang	
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Sine. Tang. Cotang. Cosine. / Sine. Tang. Cotang. Cotang. <td>- </td> <td>19</td> <td>18</td> <td>117</td> <td>16</td> <td>115</td> <td>14</td> <td>13</td> <td>12</td> <td>11</td> <td>10</td> <td>6</td> <td>00</td> <td>~</td> <td>9</td> <td>aCJ</td> <td>34</td> <td>200</td> <td>00</td> <td>8</td> <td>8</td> <td></td> <td>-</td> <td>.4(</td>	-	19	18	117	16	115	14	13	12	11	10	6	00	~	9	aCJ	34	200	00	8	8		-	.4(
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Sime.Tang.Cotang.Cosine.'Sine.Tang.Cotang.Cosine.'Sine.Tang.668199349325151-0717437311553592366021668457945610210558703722071740394169067219556061168824339330091-07114373095685823688664794551021055870372207453394269088249556202688243993426119710437305597568558236886761945651105684772657433944691937295617712688361393523811069246173055975685582458594420110566847265743384469193279557941468330613935238110686237301605526568871319473071055623725774733446919332955624156833054936585106680007299655513068873559443111055780725774733466917332955624166833073419655763136556551306887755947365110557807257747732574496092351957624186839107105667577295766513068837569558741105578072577479569521956624186839107105675572957641384669193127265748105601037257748956624110684325110766755729569565130	Cotang.	-047049	·046440	045831	045222	•044613	044005	043397	042790	042183	041576	040970	040364	039758	·039153	·038548	·037944	·037340	036736	·036133	035530		Tang.	
Sime.Tang.Cotang.Cosine.''Sine.Tang.Cotang.Cosine.''Sine.0 68319934 932515 1071743 77313537 6021 6684532 944001 11059320 7221740 3941 6910927 1 68321335 6323115 1071743 77311553 5923 6886647 944501 1057477 53743 6910927 2 68224337 933603 1071118 77305565 5523 6885761 945761 1057477 56910323 3 6832613 9352381 10692467 7307583557281 56256 6877213 9473071 725774733476 69193232 4 68330613 9352381 106802347 77305625756515131 9457551131 69236331 5 68330738 9353291 10660323 773052957453 347765917431 569193322 6 68337738 9357381 1066575 7229565551331 9473071 10555038 725774733745 593325319324 8 6839107 72377432374333475 69319237 968333294 96837556 9473676671377 $72257447332457633745639556$ $69327533955666957673395666954773324975397697395763979395098683920799357361106657567229576543332497569674332467569555676539755676539755567653975556765397556765397555676539755597659763975559765976397555976597639755597659769713276529555976597697132765295567659776397559765976957559765979597599755597569775597555975597$	Tang.	955064 1	955620 1	.956177 1	·956734 1	957291 1	.957849 1	·958407 1	.958965 1	.959524 1	960082 1	·960642 1	961201 1	102196.	.962321 1	962881 1	.963442 1	·964003 1	·964565 1	965126 1	.965688 1		Cotang.	
Sine. Tang. Cotang. Cosine. / Sine. Tang. Cotang. Cosine. / / 0 68819934 932515 1072368 73313537 60 1 944001 10569320 7221740 3941 1 6882411 933069 1071143 7311553 5924686647 945151 1057367453 3842 2 68824369 934147 1070494 7307563 5724 6870875 9446051 1057474 3644 3 6883613 935288 1069827 7305655 582 68877218 944701 1057633 7257743 3347 5 6833053 1068523 7303610 55226 6887935 6887935 7257743 3345 6 68332738 1068523 77301625 55236 6887935 694441 1055708 7257743 3345 6 68332738 1068623 77301628 55328 6887755 9447307 1055608 7255746	Sine.	-6906721	6908824	-6910927	·6913029	6915131	.6917232	6919332	6921432	6923531	6925630	6927728	6929825	6931922	6934018	.6936114	6038209	·6940304	6942398	.6944491	·6946584		Cosine.	
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	~	41	42	43	44	45	46	47	18	19	50	51	52	53	54	55	56	57	58	59	60		-	
Sine. Tang. Cotang. Cosine. ' Sine. Tang. Cosine. Cosing.' ' '	,	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20		~	f0.
Sine. Tang. Cotang. Cosine. / Sine. Tang. Cotang. 0 6881934 932515 10.72368 7313537 60 21 668457 944001 10593703 1 6882111 933003 1071148 7331553 592 6686547 944501 1057303 2 6882635 934147 1070494 7307563 5724 6876101 945651 1056354 3 6882641 9356351 1067551 1056354 668551 1056354 4 6882641 9355551 1056354 68575101 9467551 1056556 5 6832738 9355328 10686757 72395657 5130 6883546 947307 1055508 6 6832350 1066755 72295657 5130 6883545 945611 10553780 10 6843355 947307 10553780 1055328 665034 1055308 68331949107 1067307 722976454 5229 <td>Cosine.</td> <td>.7271740</td> <td>7269743</td> <td>7267745</td> <td>-7265747</td> <td>-7263748</td> <td>.7261748</td> <td>.7259748</td> <td>.7257747</td> <td>7255746</td> <td>.7253744</td> <td>.7251741</td> <td>7249738</td> <td>.7247734</td> <td>.7245729</td> <td>.7243724</td> <td>.7241719</td> <td>.7239712</td> <td>.7237705</td> <td>7235698</td> <td>.7233690</td> <td></td> <td>Sine.</td> <td>Deg. 46.</td>	Cosine.	.7271740	7269743	7267745	-7265747	-7263748	.7261748	.7259748	.7257747	7255746	.7253744	.7251741	7249738	.7247734	.7245729	.7243724	.7241719	.7239712	.7237705	7235698	.7233690		Sine.	Deg. 46.
Sine. Tang. Cotang. Cosine. I ang. 0 6823934 932515 1071743 7311553 6921 686457 9444651 1 6823934 932515 10711743 7311553 592 686457 9444601 2 68236363 9331157 59256855 5925 687501 945551 3 68236363 934147 1070444 73075537565 5825655 945204 4 6823613 9346921 1070444 73075537565 5877213 945755 5 68320611 935238 106692465 73035107555 6877213 947307 6 6832451 945755 68774213 947307 9483555 947307 8 68336934 9368355 10665757 7729965575 947337 772976455 947337 9305232 8 68339107 93252338 10667557 77297645565554 9493616741 109565	Cotang.	1.059320	1.058703	1.058086	1-057470	1-056854	1.056238	1.055623	1.055008	1.054394	1.053780	1.053166	1.052553	1.051940	1.051327	1.050715	1.050103	1.049492	1.048880	1.048270	1.047659		1	
$\label{eq:constraint} \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Tang.	-944001	944551	.945102	.945653	.946204	.946755	-947307	.947859	.948411	.948964	.949517	.950070	.950624	951178	951732	9522874	952842	953397	953952	.954508		Cotang.	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Sine.	6864532	6866647	6868761	6870875	6872988	6875101	-6877213	6879325	6881435	6883546	6885655	6887765	6889873	1861689	6894089	69619689.	6898302	6900407	6902512	6904617		Cosine.	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	-	16	55	23	24	25	26	27	28	29	30	31	32	33	34	15	36	37	30	68	40		1-	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	~	109	50	28	57	56	55	54	53	52	51	50	49	4.8	47	46	45	44	43	49	41	40	-	16.
Sine. Tang. Cotang. 68319984 932515 1-0717438 68323111 933069 1-0717438 6832313 933147 1-072368 68324387 9335093 1-0711743 6832613 933147 1-070494 6833613 9335381 1-068236 6833613 9353281 1-0680246 683391634 935538 1-0680200 683391634 9355328 1-0680200 683391634 9355328 1-0669246 683391634 9355329 1-0669246 683391054 9357329 1-0666755 968391054 9357329 1-0666755 10 6844271 939610 1-064271 13 68445471 939962 1-0644391 14 6843350 9357421 1-0665751 13 68454471 939962 1-0644391 15 6855948 941057 1-0653651 15 6855948 9412352 1-0661177 <t< td=""><td>Cosine.</td><td>7313537</td><td>7311553</td><td>7309568</td><td>7307583</td><td>7305597</td><td>7303610</td><td>.7301623</td><td>.7299635</td><td>.7297646</td><td>7295657</td><td>.7293668</td><td>7291677</td><td>7289686</td><td>200222</td><td>7985703</td><td>7983710</td><td>9171807</td><td>2070707</td><td>8644464</td><td>7275732</td><td>.7273736</td><td>Sine.</td><td>Dec. 16.</td></t<>	Cosine.	7313537	7311553	7309568	7307583	7305597	7303610	.7301623	.7299635	.7297646	7295657	.7293668	7291677	7289686	200222	7985703	7983710	9171807	2070707	8644464	7275732	.7273736	Sine.	Dec. 16.
Sine. Tang. 68224137 932515 68224137 933603 26824337 9331603 26824387 933463 6832613 934147 6833613 935484 6833613 935788 6833613 935738 6833613 935738 6833013 935733 68330163 935732 96831073 935732 96831073 9357421 96831073 9357421 96841229 9357421 10 6841229 9844351 9357451 11 6844371 12 6844271 13 6844271 13 68551830 14 6844371 15 6855183 16 6855184 17 6856184 18 6856184 19<6863183	Cotang.	898640.1	0002101	8111201	1-070494	028690-1	1.069246	1.068623	1-068000	775730-1	1.066755	1.066134	1.065512	1.064891	179480.1	1.063651	1.063031	117690.1	604190.1	721190.1	1.060556	1.059938		
Sine. 0 6819984 1 68219134 2 6824373 3 6826363 4 6828363 5 6826363 6 68324337 5 6826363 6 68326363 6 683273861 7 68348961 9 683393481 9 68339394 11 68433501 12 6844371 13 6844371 14 68443350 15 6853948 16 6853948 17 68553948 18 68553948 19 68563184 19 68563184 19 68563184 19 68563184 19 68563184 19 68563184 19 68563184 19 68563184 19 68563184 19 68563184	1	313000.	01020600	209220.	934147	609750	935238	935783	936329	936875	167760	896720.	038515	030069	019020.	231040.	902070	N26110.	18081 VD.	019959	942901	.943451	Cotang.	
201000000000000000000000000000000000000	Sine.	6010001	1110000	1117700	6826363	6858489	6830613	6839738	6834861	6836984	1010289	6661789	6843350	6845471	1024789	1140789	6861830	0001000	6856066	10000000	6860300	6862416	Cosine.	
	-	10	2 -	- 6	2 00	A.	1 10	2	10	a	00	01	LL	61	1 13	14.	K 1	191	21	a	19	20	1.	

44 Deg.

44 Deg.

NATURAL SINES AND TANGENTS TO A RADIUS 1.

44 Deg.

-	19	18	17	16	15	14	13	12	11	10	6	00	2	9	2	4	3	\$	-	0		-	45.
Cosine.	.7110041	-7107995	·7105948	1068017	.7101854	·7099806	7097757	7095707	-7093657	2091602.	.7089556	.7087504	.7085451	.7083398	.7081345	1029291	.7077236	.7075180	7073124	·7071068		Sine.	Deg. 45.
Cotang.	1.011115	1.010527	1-009939	1.009352	1.008764	1.008178	1.007591	1-007005	1-006420	1.005834	1.005249	1.004665	1.004080	1.003496	1.002913	1.002329	1.001746	1.001164	1.000581	1.000000		Tang.	
Tang.	900686-	.989582	·990158	·990734	·991311	•991888	.992465	·993042	·993620	.994199	·994777	992356	-995935	·996515	·997095	·997675	.998256	·998837	·999418	1.00000		Cotang.	
Sine.	7031879	7033947	7036014	.038081	7040147	7042213	7044278	7046342	7048406	7050469	7052532	7054594	7056655	7058716	977080776	7062835	7064894	7066953	1106907	7071068		/ Cosine. Cotang.	
~	41	42	43	44	45.	46	47	48.	4 9	50	51.	52.	53	54.	55	56	57.	58.	59	60		1	
~	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20		-	45.
Cosine.	7150830	.7148796	-7146762	7144727	7142691	7140655	7138618	7136581	7134543	7132504	7130465	7128426	7126385	7124344	7122303	7120260	7118218	7116174	7114130	.7112086		Sine.	Deg. 45.
Cotang.	•6946584 •965688 1.035530 •7193398 6021 •6990396 •977564 1.022950 •7150830 3941 •7031879 •989006 1.011115 •7110041 19	$\bullet 048676 \cdot 966251 \left[\mathbf{1\cdot034927} \cdot 7191377 \left[5922 \cdot 6992476 \cdot 978133 \right] \mathbf{1\cdot022355} \cdot 7148796 \left[38422 \cdot 7033947 \cdot 989582 \right] \mathbf{1\cdot010527} \cdot 7107995 \left[18776 \cdot 18776 \right] 18776 \cdot $	$\bullet 6950767 \cdot 966813 \left[1 \cdot 034325 \right] \cdot 71893555 \left[58 \right] \times 33 \cdot 6994555 \right] \cdot 978702 \left[1 \cdot 021760 \right] \cdot 7146762 \left[37 \right] \times 3173 \left] \cdot 7036014 \right] \cdot 990158 \left[1 \cdot 009939 \right] \cdot 7105948 \left[17 \cdot 021760 \right] \cdot 71265 \left[1 \cdot 021760 \right$	$6952858 \cdot 967376 \cdot 1033723 \cdot 7187333 \cdot 5724 \cdot 6996633 \cdot 979272 \cdot 10021166 \cdot 7144727 \cdot 3644 \cdot 7038081 \cdot 990734 \cdot 1009352 \cdot 7103901 \cdot 100235 \cdot 7103901 \cdot 100235 \cdot 7103901 \cdot 100235 \cdot 100235 \cdot 7103901 \cdot 100235 \cdot 10023$	$\bullet 654949 \cdot 967939 1033122 \cdot 7185310 5625 \cdot 6998711 \cdot 979842 1 \cdot 020572 \cdot 7142691 3545 \cdot 7040147 \cdot 991311 1 \cdot 008764 \cdot 7101854 \cdot $	-6957039 -968503 1-032520 7183287 5526 -7000789 -980412 1-01978 -7140655 34 46 -7042213 -991888 1-008178 -7099806 1	6959128 969067 1-031919 7181263 5427 7002866 980983 1-019385 7138618 33 47 7044278 992465 1-007591 7097757	$-6961217 + 969631 \left[1 - 031319\right] + 7179238 \\ 5328 + 7004942 + 981554 \left[1 - 018792\right] + 7136581 \\ 3248 + 7046342 + 993042 \\ 1 - 007005 + 7095707 \\ 1 - 007005 + 7006707 \\ 1 - 007005 + 7000707 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 007005 \\ 1 - 00700$	$\bullet 6963306, \bullet 970196 \left[1 \cdot 030719\right] \cdot 7177213 \left[5229\right] \cdot 7007018\right] \cdot 982125 \left[1 \cdot 018199\right] \cdot 7134543 \left[31\left[429\right] \cdot 7048406\right] \cdot 993620 \left[1 \cdot 006420\right] \cdot 7038657 \left[31\left(429\right] \cdot 7048406\right] \cdot 993620 \left[31\left(429\right] \cdot 708406\right] \cdot 993657 \left[31\left(429\right] \cdot 993657 \left[31\left(429\right] \cdot 708406\right] \cdot 993657 \left[31\left(429\right] \cdot 708666\right] \cdot 993657 \left[31\left(429\right] \cdot 708666\right] \cdot 993657 \left[31\left(429\right] \cdot 708666\right] \cdot 993657 \left[31\left(429\right] \cdot 7086666\right] \cdot 993677 \left[31\left(429\right] \cdot 70866666\right] \cdot 993676666666666666666666666666666666666$	$9 \cdot 6965392 \cdot 970761 \cdot 1030119 \cdot 7175187 \\ 51 \cdot 30 \cdot 7009093 \cdot 982697 \\ 1017607 \cdot 7132504 \cdot 3050 \cdot 7050469 \cdot 994199 \cdot 1005834 \cdot 7091607 \cdot 7132504 \cdot 3050 \cdot 7050469 \cdot 994199 \\ 1005834 \cdot 7091607 \cdot 1005834 \cdot 100597 \cdot 10059$	0.6967479.971326 1.029520 7173161 50 31 7011167 983269 1.017015 7130465 29 51 7052532 994777 1.005249 7089556	$ - 6969565 \cdot 971891 \left 1 \cdot 028921 \right \cdot 7171134 \left 4932 \right \cdot 7013241 \cdot 983841 \right \cdot 016423 \cdot 7128426 \left 2852 \right \cdot 7054594 \cdot 995356 \right \cdot 704665 \cdot 7087504 \cdot 7$	$ [2^{\bullet}6971651^{\bullet}972457^{\dagger}1028322^{\bullet}77169106^{\dagger}48^{\dagger}33^{\bullet}7015314^{\bullet}984414^{\dagger}1015832^{\dagger}7126385^{\dagger}27^{\dagger}53^{\bullet}7056655^{\bullet}995935^{\dagger}1004080^{\bullet}7085451^{\bullet}1004080^{\bullet}7085451^{\bullet}1004080^{$	$13^{+}6973736^{+}973023^{+}1027724^{+}7167078^{+}47^{+}34^{+}7017387^{+}984987^{+}1015241^{+}7124344^{+}26^{+}54^{+}7058716^{+}996515^{+}1003496^{+}7083398^{+}1003496^{+}100346^{+}10036^{+}100346^{+}100346^{+}100346^{+}100346^{+}1003$	$14.6975821 \cdot 973590 1\cdot 027126 \cdot 7165049 46 35 \cdot 7019459 \cdot 985560 1\cdot 014651 \cdot 7122303 25 55 \cdot 7060776 \cdot 997095 1\cdot 002913 \cdot 7081345 \cdot 908136 \cdot 9$	$(5^{-6977905} \cdot 977405 \cdot 1 \cdot 026528 \cdot 7163019 \cdot 45 \cdot 36 \cdot 7021531 \cdot 986133 \cdot 1 \cdot 014061 \cdot 7120260 \cdot 24 \cdot 56 \cdot 7062835 \cdot 997675 \cdot 1 \cdot 002329 \cdot 7079291 \cdot 702329 \cdot 7062835 \cdot 997675 \cdot 1 \cdot 002329 \cdot 7079291 \cdot 1 \cdot 002391 \cdot 1 \cdot 00291 \cdot 00291 \cdot 1 \cdot 00291 \cdot 00291 \cdot 1 \cdot 00291 \cdot 1 \cdot 00291 \cdot 1 \cdot 00291 $	$[6.6979988] \cdot 974724 \\ [1025931] \cdot 7160989 \\ [4]37 \cdot 7023601 \\ [.986707] \\ [1013471] \cdot 71118218 \\ [23]57 \cdot 7064894 \\ [.998256] \\ [1001746] \\ [-7077236] \\ [1001746] \\ [-7077236] \\ [1001746] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-7077236] \\ [-707236] \\ [-7077236] \\ [-70$	$\bullet \bullet $	$ [8] \cdot 6984153 \cdot 975859 1 \cdot 024738 \cdot 7156927 42 39 \cdot 7027741 .987856 1 \cdot 012292 7114130 21 59 \cdot 7069011 \cdot 999418 1 \cdot 000581 \cdot 7073124 1 \cdot 900581 \cdot 7073124 1 \cdot 900581 \cdot 7073124 $	$19 \cdot 6986234 \cdot 976427 \left[1 \cdot 024141 \right] \cdot 7154895 \left[4140 \right] \cdot 7029811 \\ \left[.988431 \right] \left[1 \cdot 011703 \right] \cdot 7112086 \left[20 \right] \left[60 \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \left[1 \cdot 00000 \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \right] \cdot 7071068 \\ \left[1 \cdot 00000 \right] \cdot 7071068 \\ $		Tang.	
Tang.	·977564	.978133	.978702	.979272	.979842	.980412	.980983	· 981554	.982125	·982697	.983269	.983841	·984414	-984987	.985560	.986133	707986.	.987282	987856	.988431		Cotang.	
Sine.	9680669.	6992476	·6994555	·6996633	1178998711	·7000789	.7002866	.7004942	.7007018	·7009093	-7011167	7013241	.7015314	7017387	7019459	7021531	7023601	7025672	7027741	7029811		Cosine. Cotang.	
>	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	30	39	40		-	
,	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41	40	~	45.
Cotang. Cosine.	.7193398	-7191377	·7189355	·7187333	·7185310	-7183287	·7181263	·7179238	-7177213	·7175187	·7173161	·7171134	-7169106	·7167078	$\cdot 7165049$	$\cdot 7163019$	$\cdot 7160989$	·7158959	7156927	·7154895	.7152863	Sine.	Deg. 45.
	1-035530	1.034927	1.034325	1.033723	1-033122	1-032520	1-031919	1.031319	1.030719	1-030119	1-029520	1-028921	1.028322	1.027724	1.027126	1.026528	1.025931	1.025334	1.024738	1-024141	20 ·6988315 ·976995 1.023546 ·7152863 40	Tang.	
Tang.	.965688	.966251	·966813	·967376	·967939	·968503	790996	189696-	961026.	192076.	.971326	168176.	·972457	·973023	·973590	·974156	·974724	·975291	975859	·976427	·976995	Cotang.	
Sine.	·6946584	.6948676	1970569	6952858	•6954949	66957039	.6959128	·6961217	6963305	-6965392	6967479	69696969	16971651	•6973736	-6975821	60677905	8\$66269.	-6982071	.6984153	6986234	6988315	Cosine. Cotang.	
- 1	0	1	62	3	4	2	9	2	00	6	10	11	12	13	14	15	16	17	18	61	20	-	





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