

TABLE OF SEMI-DIURNAL ARCS,

Calculated for the Principal Places in British North America.

Decl.	TORONTO. N. 43° 39' 4.		KINGSTON. N. 46° 30' 0.		HALIFAX, N. S. N. 44° 39' 3.		MONTREAL. N. 45° 31'.		FREDERICTON. N. 46° 31'.		QUEBEC. N. 46° 49' 2.	
	North. h. m.	South. h. m.	North. h. m.	South. h. m.	North. h. m.	South. h. m.	North. h. m.	South. h. m.	North. h. m.	South. h. m.	North. h. m.	South. h. m.
1 0	6 3-8	5 56-2	6 3-9	5 56-1	6 4-0	5 56-0	6 4-1	5 55-9	6 4-1	5 55-9	6 4-3	5 55-7
2 0	6 7-6	5 52-4	6 7-7	5 52-3	6 7-9	5 52-1	6 8-3	5 51-7	6 8-3	5 51-7	6 8-5	5 51-5
3 0	6 11-5	5 48-5	6 11-7	5 48-3	6 11-9	5 48-1	6 12-2	5 47-8	6 12-5	5 47-5	6 12-7	5 47-3
4 0	6 15-3	5 44-7	6 15-5	5 44-5	6 15-9	5 44-1	6 16-3	5 43-7	6 16-6	5 43-4	6 17-1	5 42-9
5 0	6 19-1	5 40-9	6 19-4	5 40-6	6 19-9	5 40-1	6 20-3	5 39-7	6 20-7	5 39-3	6 21-3	5 38-7
6 0	6 22-9	5 37-1	6 23-3	5 36-7	6 23-8	5 36-2	6 24-4	5 35-6	6 24-9	5 35-1	6 25-6	5 34-4
7 0	6 26-7	5 33-3	6 27-2	5 32-8	6 27-8	5 32-2	6 28-5	5 31-5	6 29-1	5 30-9	6 29-8	5 30-2
8 0	6 30-5	5 29-5	6 31-1	5 28-9	6 31-8	5 28-2	6 32-6	5 27-4	6 33-1	5 26-9	6 34-1	5 25-9
9 0	6 34-8	5 25-2	6 35-3	5 24-7	6 36-2	5 23-8	6 37-1	5 22-9	6 37-9	5 22-1	6 38-9	5 21-1
10 0	6 38-7	5 21-3	6 39-4	5 20-6	6 40-3	5 19-7	6 41-4	5 18-6	6 42-2	5 17-8	6 43-3	5 16-7
11 0	6 42-7	5 17-3	6 43-5	5 16-5	6 44-5	5 15-5	6 45-7	5 14-3	6 46-5	5 13-5	6 47-8	5 12-2
12 0	6 46-8	5 13-2	6 47-6	5 12-4	6 48-2	5 11-8	6 50-0	5 10-0	6 50-9	5 9-1	6 52-4	5 7-5
13 0	6 51-0	5 9-0	6 51-8	5 8-2	6 53-0	5 7-0	6 54-4	5 5-6	6 55-4	5 4-6	6 56-3	5 3-7
14 0	6 55-1	5 4-9	6 56-0	5 4-0	6 57-4	5 2-6	6 58-8	5 1-2	6 59-9	5 0-1	7 1-6	4 58-4
15 0	6 59-2	5 0-8	7 0-2	4 59-8	7 1-7	4 58-3	7 3-2	4 56-8	7 4-5	4 55-5	7 6-3	4 53-7
16 0	7 3-6	4 56-4	7 4-7	4 55-3	7 6-2	4 53-8	7 7-9	4 52-1	7 9-2	4 50-8	7 11-4	4 48-6
17 0	7 8-3	4 52-0	7 9-0	4 51-0	7 10-7	4 49-3	7 12-6	4 47-4	7 14-1	4 45-9	7 16-0	4 44-0
18 0	7 12-3	4 47-7	7 13-5	4 46-5	7 15-4	4 44-6	7 17-3	4 42-7	7 18-7	4 41-3	7 21-0	4 39-0
19 0	7 16-7	4 43-3	7 18-1	4 41-9	7 20-1	4 40-9	7 22-0	4 38-0	7 23-7	4 36-3	7 26-1	4 34-0
20 0	7 21-2	4 38-8	7 22-6	4 37-4	7 24-8	4 35-2	7 26-9	4 33-1	7 28-5	4 31-5	7 31-3	4 28-7
21 0	7 26-0	4 34-0	7 27-5	4 32-5	7 29-7	4 30-3	7 32-1	4 27-9	7 34-0	4 26-0	7 36-6	4 23-9
22 0	7 30-7	4 29-3	7 32-3	4 27-7	7 34-7	4 25-3	7 37-2	4 22-8	7 39-1	4 20-9	7 41-7	4 18-3
23 0	7 35-6	4 24-4	7 37-3	4 22-7	7 39-8	4 20-2	7 42-4	4 17-6	7 44-5	4 15-5	7 47-0	4 12-4
24 0	7 40-4	4 19-6	7 42-3	4 17-7	7 44-9	4 15-1	7 47-8	4 12-2	7 50-0	4 10-0	7 53-4	4 6-6

ANSWERS TO THE EXAMPLES FOR 1855.

(Concluded from page 29.)

Ex. 53.—Let $245=b$, $120=p$, and $346=s$, x =difference of sides; then $x=b\sqrt{(s^2-l^2-4p^2)\div(s^2-b^2)}=5$. The sides are $\frac{1}{2}s\pm\frac{1}{2}b\sqrt{(s^2-l^2-4p^2)\div(s^2-b^2)}=169$, or 174. Ans.

Ex. 54.—Let $2\sqrt{5}=\frac{1}{2}a$, then the side of required square= $1\frac{1}{2}a\sqrt{5}=4$. Ans.

Ex. 55.—Let $72=a$, and perimeter= $360=p$. (The number 258 was wrong.) The sides= $\frac{1}{2}p(a+\frac{1}{2}p)\div(a+\frac{1}{2}p)\pm\text{or}\mp\frac{1}{2}p\sqrt{(a-\frac{1}{2}p)^2-2a^2}\div(a+\frac{1}{2}p)=120$ or 90. Ans.
Sum of the legs= $p(a-\frac{1}{2}p)\div(a+\frac{1}{2}p)=210$. Hypotenuse= $\frac{1}{2}p^2\div(a+\frac{1}{2}p)=150$. An.

Ex. 56.—Let $9=a$, $12=b$, $15=c$, and x , y , and z , the required sides.

Then $x=\frac{2}{3}\sqrt{(2b^2+2c^2-a^2)}=17.088$. Ans.

$y=\frac{2}{3}\sqrt{(2a^2+2c^2-b^2)}=14.422$. Ans.

$z=\frac{2}{3}\sqrt{(2a^2+2b^2-c^2)}=10$. Ans.

Ex. 57.—Let $24=p$, $25=b$, $40=c$, $x=\frac{1}{2}$ base, then base= $2x=2\sqrt{(qn^2-nq^2+qp^2)\div(n-q)}=200\sqrt{14\div7}=106.903$. Ans.

In this $n=\sqrt{(c^2-p^2)}=32$, and $q=\sqrt{(c^2-p^2)}-\sqrt{(b^2-p^2)}=25$.

Another side= $\sqrt{(n+x)^2+p^2}=88.756$. Ans.

A third side= $\sqrt{(x-n)^2+p^2}=32.188$. Ans.

Ex. 58.—Let $a=6$, $b=4$, $c=5$, $d=3$, and r =radius; then $\frac{1}{4}\sqrt{(ab+cd)(ac+bd)(ad+bc)}\div\sqrt{(s-a)(s-b)(s-c)(s-d)}=1\frac{1}{40}\sqrt{(17290)}=3.2875$. Ans.
 $s=\frac{1}{2}(a+b+c+d)=9$.

Ex. 59.—Let $10=a$, $20=b$, $30=c$, $x=\frac{1}{2}$ side, then the side= $2x=\sqrt{(2(a^2+b^2+c^2)-2\sqrt{6(a^2b^2+b^2c^2+c^2a^2)}-3(a^4+b^4+c^4))}=20\sqrt{7}=52.9150262$. Ans.

Note.—If the given point had been *within*, the $+$ sign should have been used before the radical.

REMARK.—Owing to the difficulty of putting mathematical formulæ in type, no doubt there will be obscurities and errors in the foregoing pages, but we trust due allowance will be made for such. Any errors we have pointed out to us we shall be thankful for. There is not another set of so extensive and useful formulae published in the English language, that we are aware of, and we trust they may be acceptable to our friends. We have received a few problems for 1856 (but too late for insertion), which will appear next year. We request correspondents to *generalize* their solutions for 1856, as far as possible, by using or making literal formulæ, the answers then serve for all similar problems.

You are landed on establish a home, like banks of the lakes, you ductions, it to acquire shape an or views and a view of the leading phy in making although yo by actual a the first fav cover wheti the inhabiti and enjoy.

Place a m Union betor see and loc have to reg most indust

We will s as our start the Northern hours at Col Lake Huron ascend then feet above L some ten mi standing on Canada whi northern sh scribed, and expanse of w all around u ever, we may expanse of W future of t changes whi region at o Western Can tined agric timber region

The bound centre of all that starting most wester low for mor which separa Let us trace see how it fu River, 1,000 feet above t reach the Sa locks 70 feet Huron and t Detroit Rive mity of the through Lak here we desc by 26½ feet, through the until we arri we pass by broad, lettin the level of Lawrence. boundary o great river c by means of thus, withou the directio of the bou progress up or canoe, u have arrivd waters flow which reach to Pigeon L pretty accur Huron and of Western