

Inputs for sight reduction:

	Degrees:	Minutes:	Seconds:	Decimal:	N or S ?	
Latitude:	42	10	30	42.175	S	Just fill in d_m_s and it will convert to decimals.
Declination:	23	6	24	23.107	S	Enter N or S in CAPS
LHA or t:	61	33	42	61.562		Answer from Ageton example is 36_01.5 and 090 deg I'm just doing Hc

Basic formulas:

$$\text{Sin Hc} = (\text{Cos Lat} * \text{Cos Dec} * \text{Cos t}) +/- (\text{Sin Lat} * \text{Sin Dec})$$

This is a mix of Excel, calculator, and hand operation.
I got bogged down trying to get Excel to do it all.

10" Sterling No. 594 Slide Rule and reading glasses:

Product, on D scale, of Cos L * Cos D * Cos t:	<u>0.324</u>	Use decimal degrees above and enter the products.
Product on D scale, of Sin L * Sin D:	<u>0.2635</u>	The Sum is automatic. You have to look up Hc on S scale.
Sum:	0.5875	This adds if of same sign and subtracts if Contrary
Hc:	36	For Hc, Put G14 on D scale and read Hc on Sin part of S scale:

Don't touch anything here. This should complete automatically after you fill in rows 4 through 6.

Solution by Trigonometry only - with calculator:

Cos L:	0.741098	Sin L:	0.671397
Cos D:	0.919776	Sin D:	0.392444
Cos t:	0.476213		
Product of three Cos's by calc:	<u>0.324607</u>	Product of two Sin's:	<u>0.263486</u>
Sum Cos + Sin =	0.588093		
Sin Hc = :	0.588093		
Radians	0.628699	Radians required for Excel	

Longhand - no calculator:	
.741*.920*.476= 0.324632	By hand
.671*.392= 0.2630	"
.3246 + .2630 = .5876	"
Hc = 35.99 by calc	

Hc 36.0220 36_1.32

Solution by logs & calculator: Cosine and Sines taken from rows 20 thru 22 above.

These logs are negative and don't match what you will find in tables.

These logs are only available from a calculator - This is just to illustrate that you can solve with negative logs.

To the right we'll convert by adding 10 and expressing as 9.xxx -10

Log Cos L:	-0.13012	Log Sin L:	-0.17302
Log Cos D:	-0.03632	Log Sin D:	-0.40622
Log Cos t:	<u>-0.3222</u>	Sum log S	<u>-0.57924</u>
Sum log C	-0.48864		
Cos SuM	0.32461	Sin Sum	0.26349
Plus Sin	0.26349		
Sin Hc	0.5881		
Hc	36.022		

As found (approximately) in log tables:

Log Cos L:	9.869875 -10	Log Sin L:	9.82698 -10
Log Cos D:	9.963682 -10	Log Sin D:	9.593778 -10
Log Cos t:	<u>9.677801 -10</u>	Sum S:	<u>19.42076 -20</u>
Sum C:	29.51136 -30	Read Log Sin as:	9.42076 -10
Read Log Cos as:	9.51136 -10	Read Log Sin as:	-0.57924
Read Log Cos as:	-0.48864	Sin =	0.26349
Cos =	0.32461	This is the same as to the left but with logs expressed as in Trig tables.	
Plus Sin	0.26349		
Sin Hc =	0.5881		
Hc =	36.022		