

POLARIS REDUCTION WORKSHEET

		Set	Set	Comments/ Operations	
1	Backsight D				
2	R				
3	Average			(1+2±180°)/2	
4	Foresight D				
5	R				
6	Average			(4+5±180°)/2	
7	Angle: FS – BS			6-3	
8	Time D				
9	R				
10	Average			(8+9)/2	
11	Zone Correction			If not UT	Obs Date
12	Greenwich Civil Time of Observation			GCT 10+11	
13	<i>if 12 > 24^h, GCT = 12-24 for next day</i>			GCT	
14	Greenwich Hour Angle @ 0 ^h UT			From ephemeris	
15	Change in Sidereal Time *				
16	GHA @ Time of Observation			14+15	
17	Longitude (West -, East +)				
18	Local Hour Angle Polaris			16+17	
19	Hour Angle **			t	
20	Declination (δ)			From ephemeris	
21	Latitude (φ)				
22	Azimuth of Polaris ***			Z	
23	Azimuth of Line			22-7	
24	Mean Azimuth of All Sets				

Note that operations in red refer to the line number in the table. Asterisks refer to notes below.

Obs Date is the date of observation. If GCT > 24^h then subtract 24^h and insert the next day in the row below

* Compute the Change in Sidereal Time using:

$$\text{Change} = \text{GCT} * \left(15 \frac{\circ}{\text{h}}\right) * \left(\frac{366.2422}{365.2422}\right)$$

** If the LHA > 180°, then t = 360° – LHA and t is east and +.
If the LHA < 180°, then t = LHA and t is west and -.

** *The Azimuth is computed as:

$$\tan Z = \frac{\sin t}{\tan \delta \cos \varphi - \sin \varphi \cos t}$$