

03 - The Night Sky Project - Positions & Motions

Part B -- Procedure

Use the same procedure as in part A to measure the altitude and azimuth of stars of 4 stars in four different directions to watch their motions..

- 1) Pick four stars and measure their positions in human coordinates each **half hour**. Record your observations in Tables 3, 4, 5 and 6, respectively, for each star. The *approximate* human coordinates for each star should be:

North — 10° to 30° from Polaris

East — Altitude below 30° , azimuth between 70° and 120°

South — Altitude between 20° and 40° , azimuth between 150° and 210°

West — Altitude between 20° and 40° , azimuth between 250° and 300°

Using The Trained Sky Star Atlas, find and identify the stars. Record their names, and coordinates and magnitudes in Tables 1, 2, 3 and 4 as appropriate. Explain how you identified each star.

Tricks of the Trade

- 1) *Let your star atlas help you use stars you know to find stars you don't know. If two stars point at a third on your star map, they will do so in the sky. If two stars are 30° apart on the star map, they will be 3 hands apart in the sky.*
- 2) *Pick stars that are brighter than 3rd magnitude. Avoid faint stars.*
- 3) *Take extreme care in measuring the positions of each star. Repeat your measurement a couple of times.*
- 4) *Take extreme care that you have the right star before taking a measurement.*

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Table 3: Northern Star

Common Name	Bayer-Flamsteed Name	RA h	RA m	Dec °	Dec '	Alt °	Azi °	Color	Time

Table 4: Eastern Star

Common Name	Bayer-Flamsteed Name	RA h	RA m	Dec °	Dec '	Alt °	Azi °	Color	Time

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Table 5: Southern Star

Common Name	Bayer-Flamsteed Name	RA h	m	Dec °	'	Alt °	Azi °	Color	Time

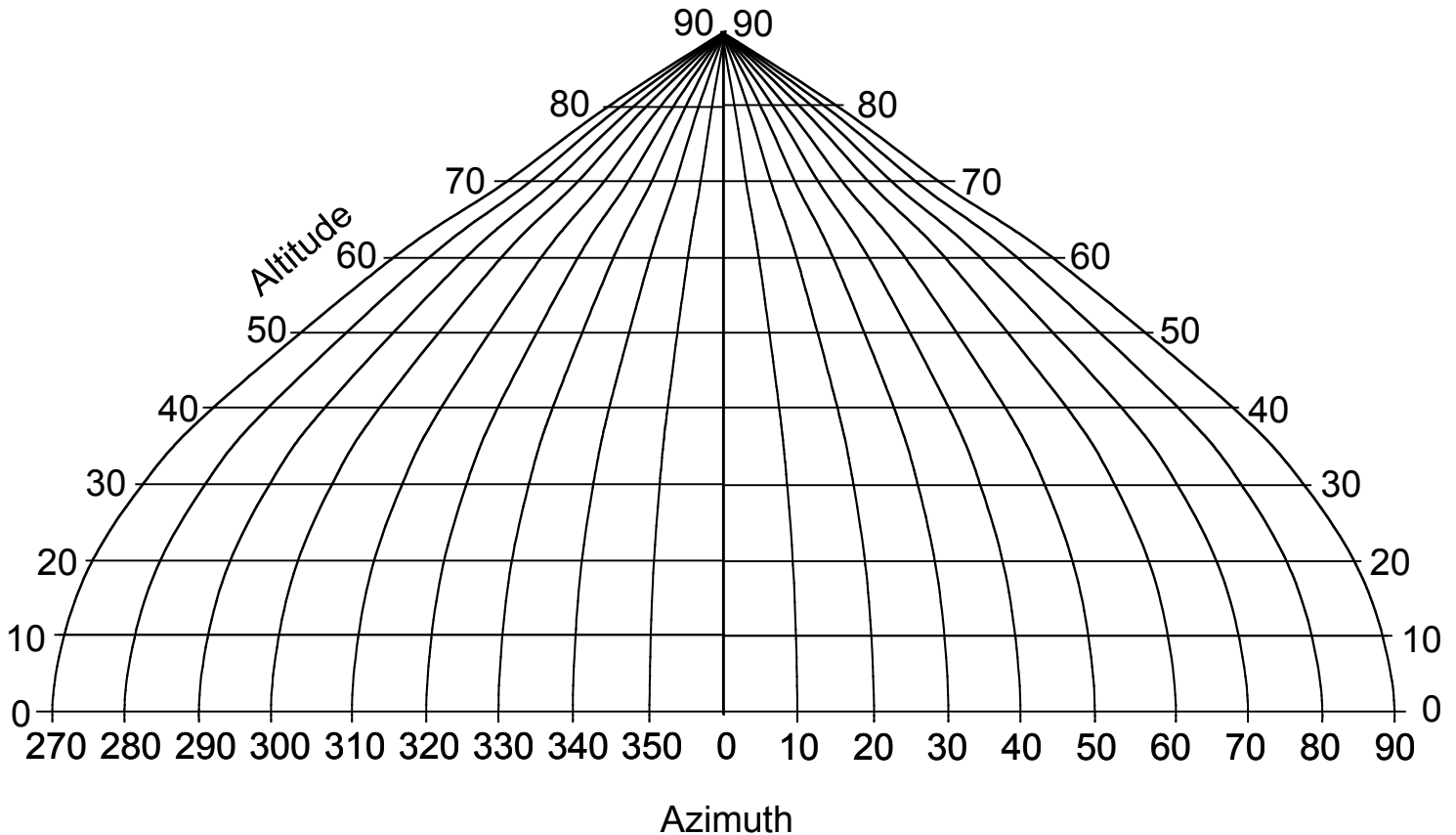
Table 6: Western Star

Common Name	Bayer-Flamsteed Name	RA h	m	Dec °	'	Alt °	Azi °	Color	Time

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Questions

6) Plot the ALTITUDE & AZIMUTH for the NORTHERN star on the graph indicating TIME for each position.



7) Calculate the conversion from mm to degrees using the azimuth scale on the bottom of the graph. Place the ruler with 0 mm at 0 degrees azimuth, read off how many mm's corresponds to 90 degrees azimuth (_____ mm).

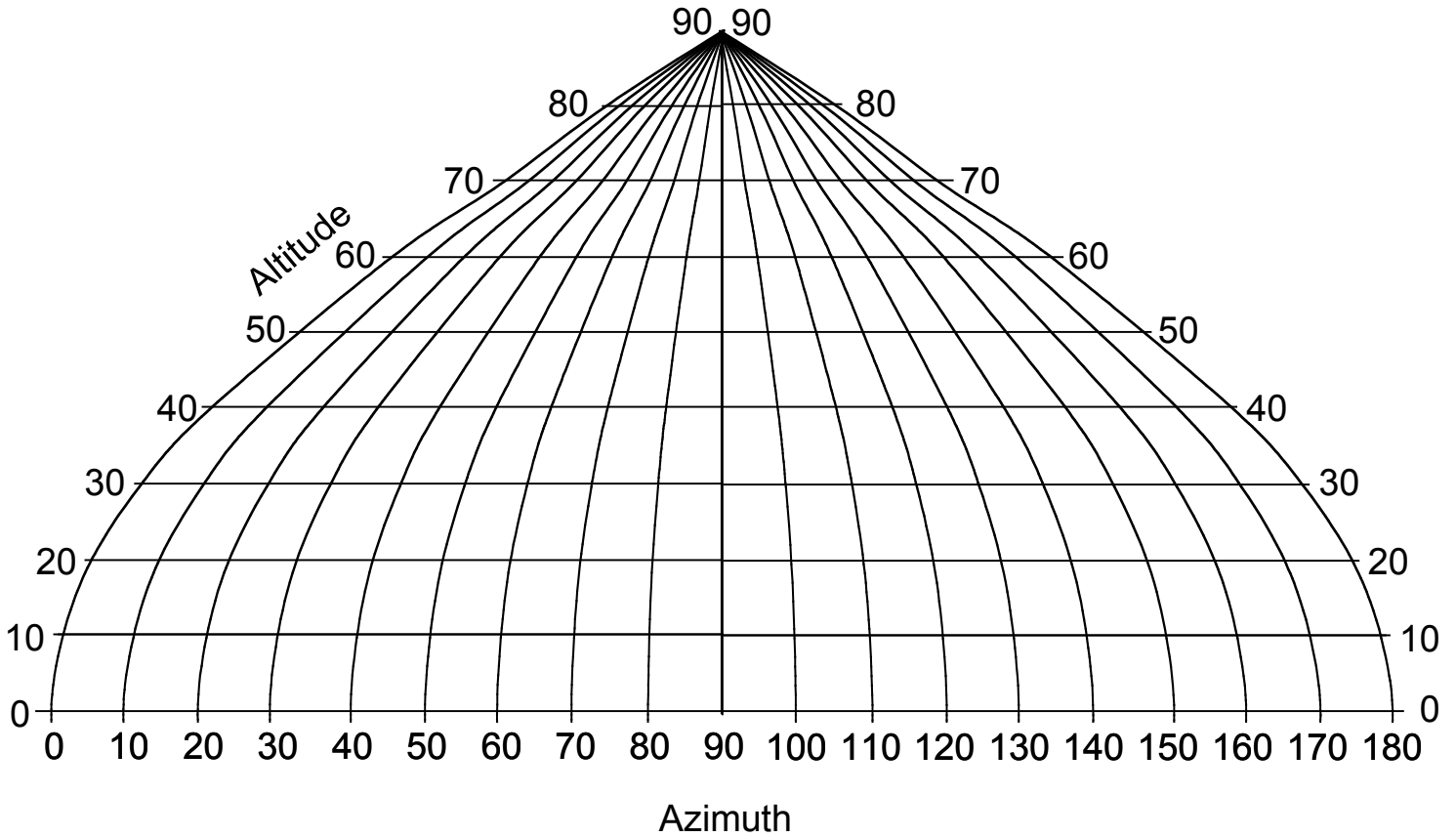
8) Divide 90 by your answer to (7) to get conversion factor = _____ degrees per mm.

9) How many mm (on the graph does the Northern Star move? _____ mm

10) How many degrees did the Northern Star move? Multiply your answer to (9) by your conversion factor from your answer to (8). _____ degrees

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11) Plot the ALTITUDE & AZIMUTH for the EASTERN star on the graph indicating TIME for each position



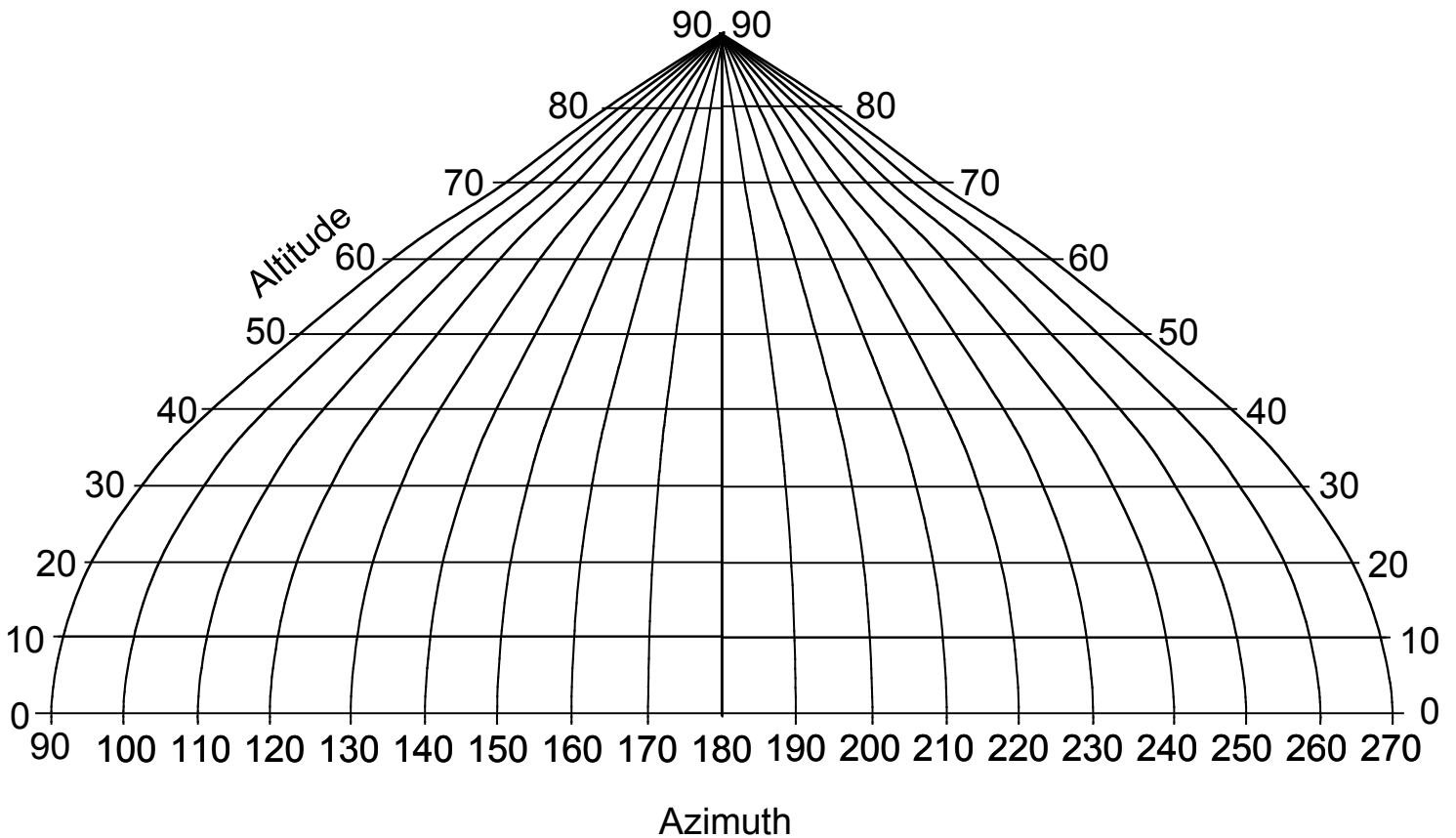
12) How many mm (on the graph does the EASTERN Star move? _____ mm

13) How many degrees did the EASTERN Star move? _____ degrees

14) At what TIME and AZIMUTH did the EASTERN star rise? TIME _____ AZIMUTH _____

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15) Plot the ALTITUDE & AZIMUTH for the SOUTHERN star on the graph indicating TIME for each position



16) How many mm on the graph does the SOUTHERN Star move? _____ mm

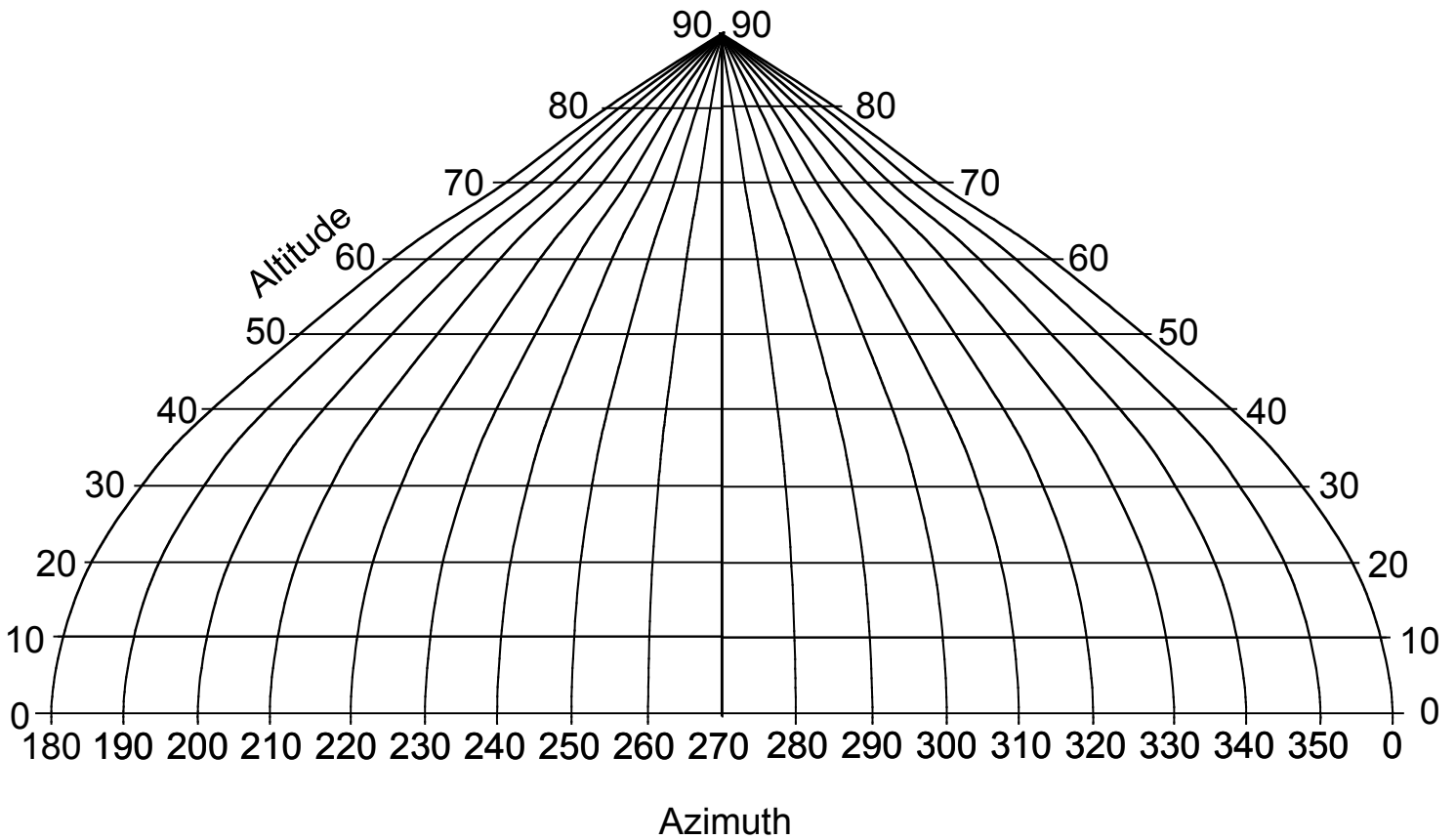
17) How many degrees did the SOUTHERN Star move? _____ degrees

18) At what TIME and AZIMUTH did the SOUTHERN star RISE? TIME ____ AZIMUTH ____

19) At what TIME and AZIMUTH will the SOUTHERN star SET? TIME ____ AZIMUTH ____

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20) Plot the ALTITUDE & AZIMUTH for the WESTERN star on the graph indicating TIME for each position



21) How many mm on the graph does the WESTERN Star move? _____ mm

22) How many degrees did the WESTERN Star move? _____ degrees

23) At what TIME and AZIMUTH will the WESTERN star SET? TIME _____ AZIMUTH _____

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24) Collect the following information and record in Table 7

Table 7: Star motions

Star	First Time	Last Time	Distance Moved (deg)	Elapsed Time (min) (last – first)	Speed (deg/min) (distance moved divided BY elapsed time)
Northern					
Eastern					
Southern					
Western					

25) Look at Table 7. Which star moved slowest? _____

26) Look at table 7. Which star moved fastest? _____

27) Where in the sky do you expect stars to move the slowest? Where do you expect them to move the fastest? Explain why.

<i>Answer:</i> _____ _____ _____ _____ _____ _____ _____ _____ _____ _____
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