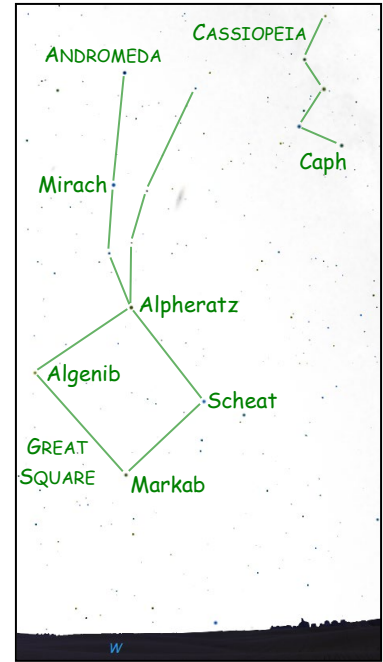


## RISING, SETTING, AND TIME IN THE SKY

The stick figures of the Great Square of Pegasus, Andromeda and Cassiopeia at 8 pm on 1/24/25 are shown. In the table,

- a)<sup>5</sup> look up the Other Name in the Field Guide.
- b)<sup>5</sup> Label the stars in the table on the diagram with these.
- c)<sup>20</sup> Calculate the indicated quantities for each star at **declination  $\delta$**  for an observer at **latitude  $\lambda$** :



### RISING AND SETTING POSITIONS

$$A_{\text{rise}} = \cos^{-1} \left( \frac{\sin \delta}{\cos \lambda} \right) \text{ degrees} \quad A_{\text{set}} = 360 - A_{\text{rise}} \text{ degrees}$$

### MAXIMUM ALTITUDE (AT TRANSIT)

$$\text{Alt}_{\text{Max}} = \text{Alt}_{\text{CE}} + \delta = (90 - \lambda) + \delta \text{ degrees}$$

### TIME ABOVE THE HORIZON

$$\Delta t = \frac{2}{15} \cos^{-1} (-\tan \lambda \tan \delta) \text{ hours}$$

STAR	OTHER NAME	$\alpha$	$\delta$		CANTON, NY ( $\lambda = 44^\circ 36' = 44.6^\circ$ )			
			deg min	degrees	$A_{\text{RISE}}$ (deg)	$A_{\text{SET}}$ (deg)	MAX ALT.	$\Delta t$ (h)
$\alpha$ And	Alpheratz	00 <sup>h</sup> 08 <sup>m</sup>	29° 05'	29.1	46.95	313.05	74.5	16.4
$\beta$ And	Mirach	01 <sup>h</sup> 10 <sup>m</sup>	35° 37'	35.6	35.1	324.9	81.0	18.0
$\alpha$ Peg	Markab	23 <sup>h</sup> 05 <sup>m</sup>	15° 12'	15.2	68.4	291.6	60.0	14.1
$\beta$ Peg	Scheat	23 <sup>h</sup> 04 <sup>m</sup>	28° 05'	28.1	48.6	311.4	73.5	16.2
$\gamma$ Peg	Algenib	00 <sup>h</sup> 13 <sup>m</sup>	15° 11'	15.1	68.4	291.6	60.6°	14.1
$\beta$ Cas	Caph	00 <sup>h</sup> 09 <sup>m</sup>	59° 09'	59.2	Circumpolar!		104.6°	24
$\alpha$ Sco	Antares	16 <sup>h</sup> 30 <sup>m</sup>	-26° 26'	-26.4	128.7	231.3	19.0	5.2

d)<sup>10</sup> Show the approximate rising path of each star below (they all rise at an angle of 45° in Canton) (They all rise parallel!)

$\text{Alt} > 90^\circ$  means Caph is in the northern sky (north of the zenith)

