

RISING, SETTING, AND TIME IN THE SKY

a)³⁰ For object at **declination δ** & observer at **latitude λ** :

RISING AND SETTING POSITIONS

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

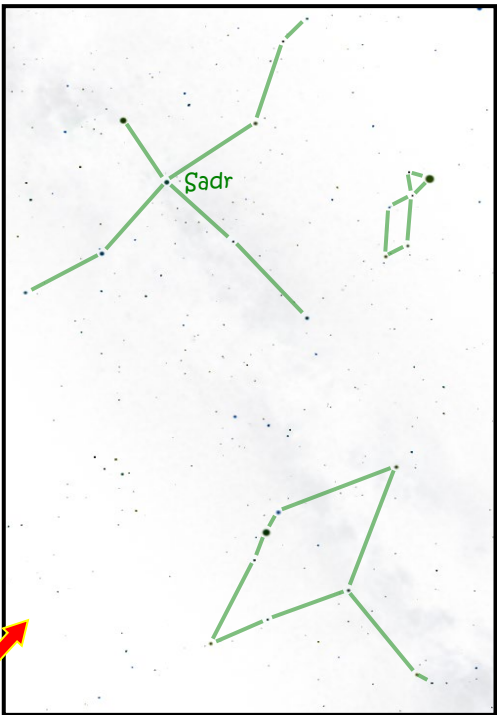
MAXIMUM ALTITUDE (AT TRANSIT)

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

TIME ABOVE THE HORIZON

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

b)⁹ Label stars (in table), constellations, & Summer Triangle:



STAR	OTHER NAME	α	δ		CANTON, NY ($\lambda = 44^{\circ}36' = 44.6^{\circ}$)			
			deg min	degrees	A_{RISE} (deg)	A_{SET} (deg)	MAX ALT.	Δt (h)
α Lyr	Vega	$18^{\text{h}}37^{\text{m}}$	$+38^{\circ}47'$					
β Lyr		$18^{\text{h}}50^{\text{m}}$	$+33^{\circ}22'$					
α Cyg		$20^{\text{h}}41^{\text{m}}$	$+45^{\circ}16'$					
β Cyg		$19^{\text{h}}31^{\text{m}}$	$+27^{\circ}58'$					
α Aql		$19^{\text{h}}51^{\text{m}}$	$+8^{\circ}52'$					

c)⁵ Show the approximate rising path of each star below (they all rise parallel to the CE at an angle of 45.4° in Canton)

