Name ___Solution___

RISING, SETTING, AND TIME IN THE SKY

[30]For object at **declination** δ and observer at **latitude** λ:

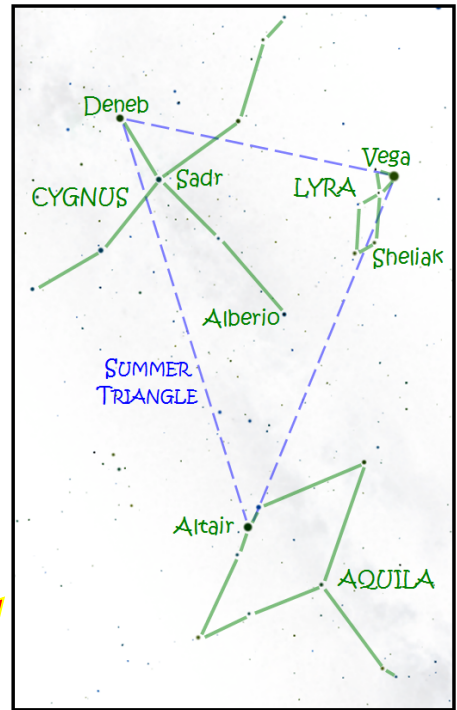### RISING AND SETTING POSITIONS

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

MAXIMUM ALTITUDE (AT TRANSIT)

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

TIME ABOVE THE HORIZON

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

3 C
7 s.
3

Use second worksheet to draw stick figures & label stars & constellations:[16]

STAR	OTHER NAME	α	δ		CANTON, NY (λ = 44°36' = 44.6°)			
			deg min	degrees	A_RISE (deg)	A_SET (deg)	MAX ALT.	Δt (h)
α Cyg	Deneb	20ʰ41ᵐ	+45°16'	45.27°	3.9°	356.1°	90.7°	23.3
β Cyg	Alberio	19ʰ31ᵐ	+27°58'	27.97°	48.8°	311.2°	73.4°	16.2
γ Cyg	Sadr	20ʰ22ᵐ	+40°15'	40.25°	24.9°	335.2°	85.7°	19.6
α Lyr	Vega	18ʰ37ᵐ	+38°47'	38.78°	28.4°	331.6°	84.2°	19.0
β Lyr	Sheliak	18ʰ50ᵐ	+33°22'	33.37°	39.4°	320.6°	78.8°	17.4
γ Lyr	Sulaphat	18ʰ59ᵐ	+32°41'	32.68°	40.7°	319.3°	78.1°	17.2
α Aql	Altair	19ʰ51ᵐ	+8°52'	8.87°	77.5°	282.5°	54.3°	13.2

Show the approximate rising path of each star below (they all rise at an angle of 45° in Canton)[6]
(They all rise parallel!)