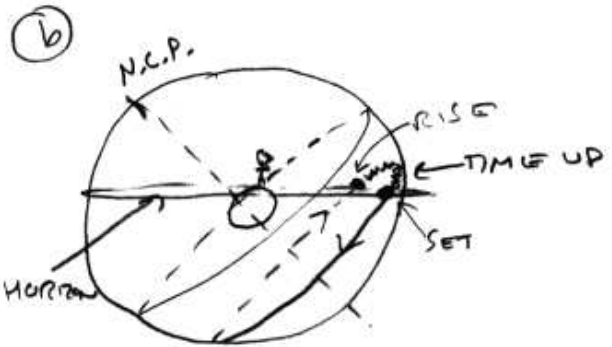
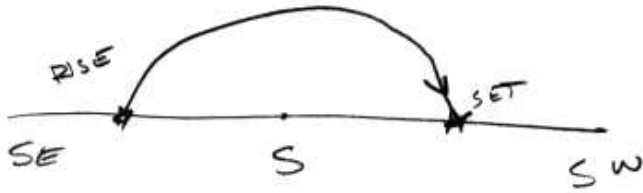


1 a

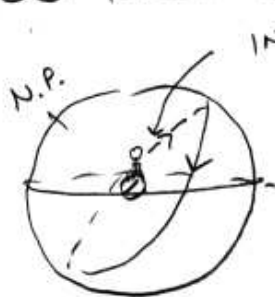


NOTE: IF I SAID "NOT ALL THE WAY OUT" IN (a), THAT'S BECAUSE EITHER YOU INDICATED THAT THE STAR RISES DUE E AND SETS DUE W, OR FAILED TO INDICATE THAT IT DOES NOT

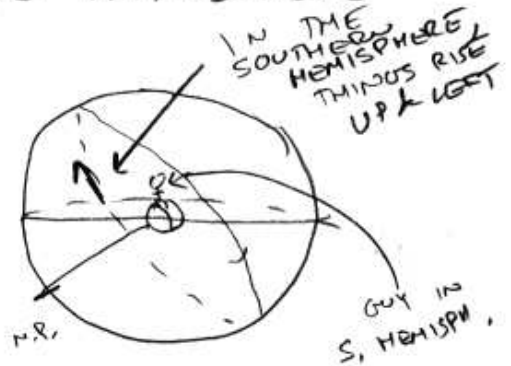
2
$$\left(\frac{360^\circ}{\text{CIRCLE}}\right) \left(\frac{1 \text{ CIRCLE COMPLETED}}{24\text{h}}\right) = \underline{15 \frac{\text{DEGREES}}{\text{HOUR}}}$$

3 IF THINGS ARE RISING, YOU MUST BE LOOKING EASTISH. (NE, E, OR SE).

YOU MUST BE IN THE SOUTHERN HEMISPHERE



IN THE NORTHERN HEMISPHERE, THINGS RISE UP & RIGHT



IN THE SOUTHERN HEMISPHERE, THINGS RISE UP & LEFT

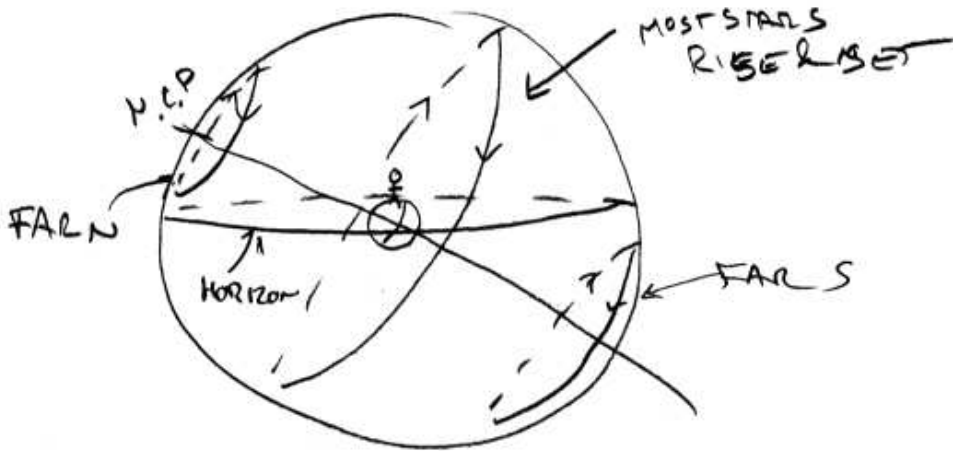
ROTATE DIAGRAM

⇒ SEE ALSO THE "NORTH & SOUTH" ANIMATION ON THE "HANDOUTS" PAGE

4

STARS FAR ENOUGH TO THE NORTH ARE CLOSE ENOUGH TO THE NORTH POLE THAT EVEN AT THEIR LOWEST, THEY NEVER RISE BELOW THE HORIZON.

THE OPPOSITE IS TRUE FOR STARS CLOSE TO THE SOUTH POLE

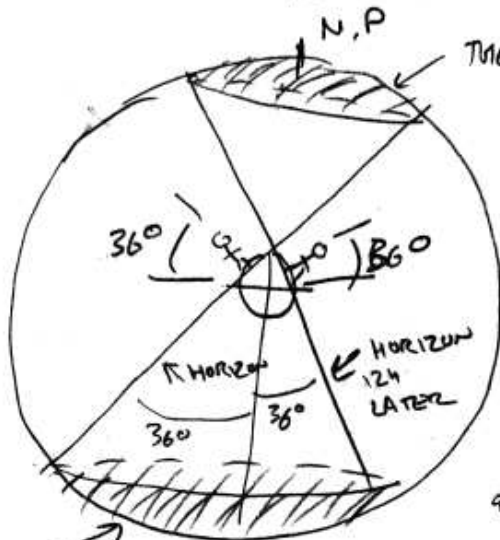


5

THE EQUATOR. ANYWHERE ELSE, YOU'LL HAVE SOME NEVER-RISEERS FROM THE PREVIOUS PROBLEM

6 $\frac{1}{2}$: EVERYTHING NORTH OF THE CELESTIAL EQUATOR

7



THIS FRACTION OF THE SKY NEVER RISES IN NASHVILLE

WHAT FRACTION IS THAT?

IT TAKES CALCULUS TO GET A NUMBER, SO

⇒ DON'T WORRY ABOUT IT!

IF YOU WANT TO KNOW:

$$\frac{\int_{90}^{270} \int_0^{2\pi} \sin \theta d\theta d\phi}{4\pi} = \frac{2\pi \int_0^{90} \sin \theta d\theta}{4\pi} = \frac{1}{2} [-\cos \theta]_{0}^{90}$$

$$= \frac{1}{2} [0 + 0.59] = \boxed{29\% \text{ OF THE SKY}}$$

WE NEVER SEE