

Due in section the week of February 8th

Problems are based off lecture and readings - Show all work - Don't forget units - 10pts total

1) Unit Conversions - Show all steps to convert the number (1pt each)

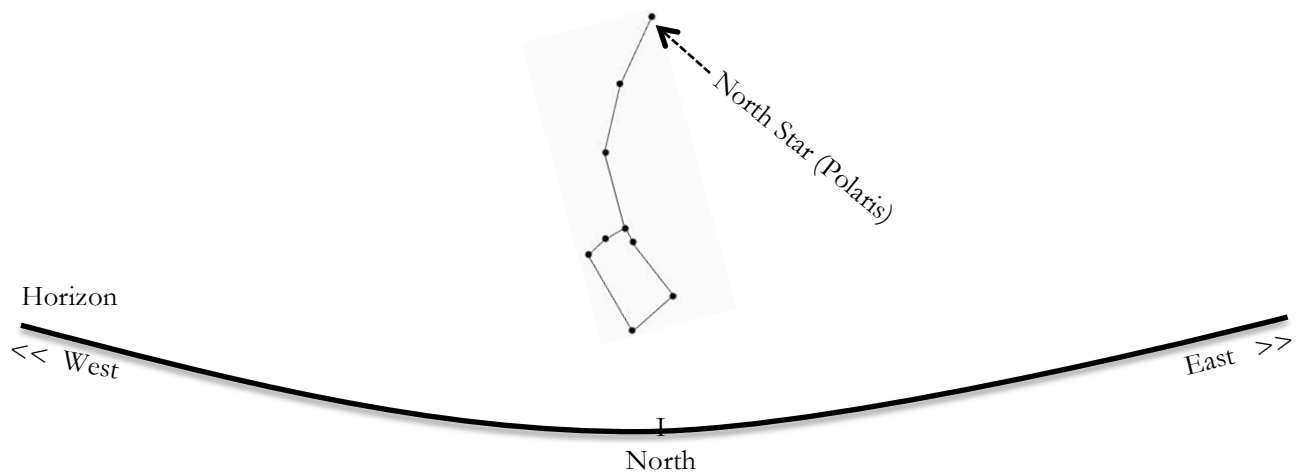
a) On average Pluto is 3.67 billion miles from the Sun, on the outskirts of the solar system, if there are 1609 meters in 1 mile how far is Pluto from the Sun in meters? Most of what we will be studying will lie within this distance. Don't forget units.

b) Using part a) if there are 1.5×10^{11} meters in 1 astronomical unit (1 AU = Earth-Sun distance) how far is Pluto from the Sun in AU? Don't forget units.

2) Motion of the stars (2pts)

The North Star is at the very end of the little dipper.

a) By considering the Earth's rotation and apparent motion of the stars draw how the little dipper would appear in 6hrs, 12hr, 18hrs, and 24hrs. Label each drawing.



3) Algebra Basics (1pt each)

Here are some basic equations we will be using throughout the semester. This is a good example of the level of math that will be expected. Show all work!

a) Solve for v .

$$P = \frac{2\pi R}{v}$$

b) Plug in your answer to part a) to write the following equation without v in it.

$$g = \frac{v^2}{R}$$

c) Plug in your answer to b) to write the following equation without a g in it.

$$g = \frac{GM}{R^2}$$

d) Write your answer to c) in the form $P^2 = \dots$

4) Speed of light (1pt each)

a) Radio signals travel at the speed of light (3×10^8 meters per second). Using your answer to part 1a) How long would a radio signal take to reach Pluto from the Sun? Express your answer in hours.

b) How long does it take light to travel 1AU, the distance between the Earth and Sun? Express your answer in minutes.