Name: _____

Student #: _____

ASTR 311 2016 S — Tutorial 1

Scientific Method, Equation manipulation, Scientific Notation, Angular and Distance measurement

1 Think about it!

1. Arrange the following distance units in order of increasing magnitude; parsecs, km, feet, inches, astronomical units, light years

2. How could you use the scientific method to prove it rains in Vancouver?

3. What is parallax? Give an everyday example.

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2 Experiment

How far and how high is the clock tower?

In this part of the lab you will use the following equation to estimate the distance to the clock tower,

$$\text{Distance} = \frac{57.3 \text{ degrees}}{\text{Parallax}} \text{Baseline}.$$

Once you have the distance we will use the same formula rearranged a bit to determine the height of the tower,

$$\text{Size} = \frac{\text{Angular Size}}{57.3 \text{ degrees}} \text{Distance}$$

What measurements will you have to make?

Your TA will demonstrate how to estimate parallax and angular size in the lab.

You can use whatever units are convenient, *e.g.* the size of your shoe, your height, the length of your step .... Please show your working in the boxes.

Distance from Hennings to Clock Tower	
Height of Clock Tower	

 :TIP OF LITTLE FINGER	1 degree	 :MIDDLE THREE FINGERS	4 degrees	FULL FIST: 	10 degrees

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3 Practice!

Give all your answers to the following questions in scientific notation.

$$1\ \mathrm{M}_{\odot} = 2 \times 10^{30}\ \mathrm{kg}, c = 3 \times 10^{8} \mathrm{m\ s}^{-1}$$

1. Our Galaxy is approximately a billion solar masses. Calculate its mass in kg.

2. If a star has a parallax of 0.1 arcsecond What is its distance to us in parsecs km and light years?