

General Astronomy (29:61)
Fall 2012
Homework Set #6
Assigned: October 20, 2012
Due: October 26, 2012

1. What is the angular size (angular radius) of the planet Venus when it is 1 astronomical unit from us? Give your answer in arcseconds.
2. A Celestron C8 telescope has a focal length of 2032 mm. If I want to look at astronomical objects with a magnification of 200X, what is the focal length of the eyepiece that I must use?
3. A reflector telescope has a focal ratio of f7. The diameter of the mirror is $D = 50$ cm. What is the image scale of this telescope?
4. The Green Bank radio telescope has a diameter of 100 m. It makes observations at a frequency of 5000 MHz, as well as other frequencies. When it observes at 5000 MHz, does it see any detail in a source 40" in angular diameter, or does this object appear as a point source (source which is pointlike)?
5. In what follows, I give wavelengths of spectral lines astronomers would like to observe. For each one, indicate whether it could be observed with a telescope on the surface of the Earth. Give reasons for your choices. Pay attention to the units, which are different in each case. (a) 100 nm, (b) 500 nm, (c) 10 μm (microns), (d) 100 μm , (e) 10 cm.
6. Next semester you will learn about different types of stars. A kind of star called a spectral class O9 star has a photospheric temperature of 33,000 K. At what wavelength is it brightest? Can we measure the peak of its spectrum with telescopes on the surface of the Earth? Show calculations and give reasons.
7. Problem 6.4 from the textbook
8. Problem 6.6 from the textbook