

29:50 Stars, Galaxies, and the Universe
Instructor: Spangler
Homework Assignment #2
September 7, 2010

1. What (*very approximately*) is the diameter of the Earth in light units?
 - (a) less than 0.1 seconds
 - (b) 5 seconds
 - (c) 32 seconds
 - (d) 3.5 minutes

2. As time goes on, why does it become increasingly difficult to communicate with deep-space probes like Voyager?
 - (a) the time for the signal to get there and come back gets too long
 - (b) the signal strength is weakened by the great distance it has to travel
 - (c) matter in interplanetary space absorbs the radio waves

3. What is a very simple observational test that you can do to determine if all stars are the same, and like the Sun. In thinking of an answer to this, imagine yourself restricted to naked eye observations of a dark sky. You have access to no information other than the fact that the Sun is a star.
 - (a) the stars are different because they have different colors
 - (b) the stars are different because some are bright and some are faint
 - (c) the stars are all the same because they shine against the night sky
 - (d) the stars are all the same because they have the same color and brightness

4. A star is measured to have a parallax of 0.020 arc seconds. How far away is it?
 - (a) 1 parsecs
 - (b) 0.020 parsecs
 - (c) 5 parsecs
 - (d) 50 parsecs
 - (e) 200 parsecs

5. A star is measured to have a parallax of 0.020 arc seconds. How far away is it *in light years*?
 - (a) 27 light years
 - (b) 163 light years
 - (c) 50 light years
 - (d) 13 light years
 - (e) 547 light years

6. How many times further away is the Sun than the Moon? That is, if the average distance between the Earth and Moon was 1 unit of distance, how many units would there be to the Sun?
 - (a) 15
 - (b) 37
 - (c) 109
 - (d) 390
 - (e) 732

7. Which of the following is a correct statement of differences between the Jovian (Jupiter-like) and Terrestrial (Earth-like) planets?
 - (a) The Jovian planets are at greater distances from the Sun than the Terrestrial planets.
 - (b) The Terrestrial planets are at greater distances from the Sun than the Jovian planets.
 - (c) The Jovian planets shine only by reflected light, while the Terrestrial planets shine by light they emit.
 - (d) The Jovian planets and Terrestrial planets orbit different stars.

8. The celestial equator intersects the ecliptic at two points on the celestial sphere. These two points are
 - (a) the summer solstice and the winter solstice
 - (b) the Galactic center and the Galactic anticenter
 - (c) the vernal equinox and the autumnal equinox
 - (d) the two points do not have common names, but they are located at $RA=7h42m$, $dec=+9.5d$, and $RA=16h11m$, $dec=+34.3d$.

9. What astronomical event will occur in a little over three weeks?
 - (a) winter solstice
 - (b) vernal equinox
 - (c) summer solstice
 - (d) autumnal equinox
 - (e) upper culmination of Polaris