Astronomy
HOMEWORK Chapter 1 9th ed

5. In Figure 1-8, what is another name for the “Sun’s annual path?”

10. By about how many degrees does the Sun move along the ecliptic each day?

12. Through how many constellations does the Sun move every year?

14. What are the vernal and autumnal equinoxes? What are the summer and winter solstices? How are these four events related to the ecliptic and the celestial equator?

25. How is an annular eclipse of the Sun different from a total eclipse? What causes this difference?

27. At what phase(s) of the moon does a solar eclipse occur? A lunar eclipse?

30. During what phase(s) does the Moon rise after sunrise but before sunset? After sunset but before sunrise? At sunset? At sunrise?

31. Why can’t a person in Australia use the Big Dipper to find north?

33. At what places on Earth is Polaris seen on the horizon?

34. Where do you have to be on Earth to see the Sun at your zenith? If you stay at one such location for a full year, on how many days will the Sun pass through your zenith?

36. Where on the horizon does the Sun rise at the time of the vernal equinox? [I.e., Northeast, southeast, etc.]

41. What is the phase of the Moon if it: a. rises at 3 AM? b. sets at 9 PM? At what time does: c. the Full Moon set? d. The first quarter Moon rise?
42. What is the phase of the Moon if, on the first day of spring, the Moon is located: a. on the vernal equinox; b. on the summer solstice; c. on the autumnal equinox; d. on the winter solstice?

53. Assuming the Sun makes an angle of $1/2^\circ$ in the sky, and is at a distance of $1.496 \times 10^{11}$ m, what is the Sun’s diameter? This formula might be easier than the one in the text:
   \[
   \text{Physical Diameter} = (\text{Distance}) \times \left(\text{Angle in Degrees}/57.3\right)
   \]

62. What if the Earth’s axis of rotation were at a different angle? What would the seasons be like if where you are now if the axis of rotation were tilted a. $0^\circ$; and b. $45^\circ$ to its orbital plane? What would be different about the seasons and the day-night cycle if you lived at one of Earth’s poles in these two situations? What would be different about living in San Diego?