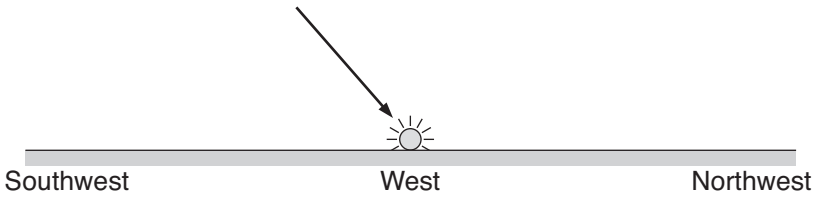
Astronomy (Schroeder) Name _____
fall 2011

Exercise 2

Due Friday, September 2, 5:00 pm

1. The illustration below shows the western horizon and the setting sun as viewed from Ogden (41° N latitude) in late September. (The sun's size is greatly exaggerated.) The arrow indicates the direction in which the sun has been moving, with respect to the horizon, prior to sunset. On this same illustration, sketch the approximate location and direction of the sunset in a similar way for a date in late June and a date in late December. Label the illustration clearly to indicate which is which.



2. On the same illustration above, draw suns and arrows to indicate how the sunset would appear on the same three dates as viewed from Tasmania, at 41° *south* latitude. Label everything clearly.

3. Recall that the angle between the northern horizon and the north celestial pole is equal to your latitude, about 41 degrees in Ogden, Utah. At the equinox, the position of the sun in our sky lies on the "celestial equator," an imaginary circle in the sky that is directly above earth's equator. Suppose that you are viewing the sun at its highest point in the sky at the equinox. What is the angle between the sun and your horizon? Explain your answer with a careful sketch.

4. Why is it hotter in summer than in winter?

5. Suppose that, on a particular night, the moon rises at midnight. At approximately what time will the moon rise the following night? (Please explain briefly.)

6. The illustration below again shows the western horizon as seen from Utah in late September (not necessarily this year). This time the sun has just set. As you admire the beautiful view, you notice that the moon is also visible somewhere in the western sky. Sketch the moon as it might appear at this time, being careful to show it in the correct location, with the correct phase, and with the illuminated part of the moon facing the correct way. (You may exaggerate the moon's size.)

7. Referring to the view shown in the sketch above, explain how you can tell that the moon shines by reflected sunlight.

8. Again referring to the view shown above, explain how you can tell that the moon is closer to us than the sun is.