

**29:52 Exploration of the Solar System**  
**Homework Assignment # 2**  
**February 8, 2008**

1. It is noon, apparent solar time, here in Iowa City. What is the apparent solar time in Denver, Colorado? **Note:** to answer this question, you need to find some information which is not given here, nor is it in the book.
2. Use *Starry Night* to find the right ascension and declination of Jupiter and Saturn. What constellations are they in? Use your SC1 chart to determine if they are on the ecliptic or not. “On the ecliptic” would include being within a couple of degrees.
3. Assume the *obliquity of the ecliptic* (a single astronomical term) were  $40^\circ$  instead of  $23.5^\circ$ . Think of and list some differences in the sky, the weather, properties of the seasons, behavior of animals, behavior of your roommate, etc.

4. Here is an exercise that might illustrate how small differences between the mean solar day and the apparent solar day can accumulate, over many days, to a significant difference between civil noon and apparent noon.

This same model problem can illustrate how the calendar can get out of whack if extra days are not inserted in leap years.

Let’s say there are two clocks, A and B. A runs fast, so that it runs through 24h12m while B has exactly 24 hours. They are synchronized at midnight. Five days later at midnight according to Clock B, what is the time according to Clock A?

5. Use *Starry Night* to find the position of the Moon now (i.e. at the time you are working on these problems). What is its phase? Now, use your SC1 chart to help you answer these next questions. What is the angle between the Sun and Moon at this time (use the angular scale on the ecliptic on the SC1)? Does this make sense in terms of Figure 2.19? Is the Moon above, below, or on the ecliptic?