

AST 301  
Homework #2  
Due Friday Feb. 4

1. Look up the orbital period of the Moon (in Appendix A of Seeds). This is the orbital period of the Moon as seen by a distant observer.

Knowing the number of days in a year calculate the number of lunar orbits in a year (the answer won't be an integer).

Find a calendar which shows which day the Moon is full this month and next month. How many days are there between this month's full moon and next month's? This should not be the same as the orbital period. After you do this problem you should know why and how they are different. By reading dates off of a calendar, your answer for the number of days between full moons will necessarily be an integer. How could you get a more accurate number, which wouldn't necessarily be an integer?

Calculate the number of lunar months in a year (that is, the number of cycles from full moon to full moon. Again, the answer won't be an integer).

Get four people together, one to be the Sun, one the Earth, one the Moon, and one to be a distant star. Have the Earth walk slowly around the Sun while the Moon is walking more quickly in a smaller circle around the Earth. Have the star count how many orbits of the Moon occur in a year (that is, how many times the Moon is lined up between the Earth and the star in the time it takes the Earth to walk once around the Sun). Have the Sun count the number of full moons in a year (that is, the number of times in a year the Moon lines up behind the Earth as seen by the Sun).

Discuss (verbally and then in writing) what your walking around tells you about the difference between the number of lunar orbits in a year and the number of months in a year. Note: our calendar month doesn't quite agree with either of these.

2. Describe in a sentence or two how the path of the Sun across the sky in June differs from its path in December. Explain why this difference makes it hotter here in June.

Watch the Sun during a day this week. (Don't stare at it!) Note where it is in the sky at some convenient times (like at noon). (Or maybe it's better to note the lengths of some shadows, so you aren't tempted to look at it too much.) We'll do this again in April to see how the path of the Sun changes.