When you do a calculation, show all your steps. Do not just give an answer.

5.1  (a) In the image below, measure the diameter of the Moon in cm.

![Moon Diameter Image]

(b) Try to find a circular object with an edge that will match the curve of the Earth’s shadow on the Moon in the diagram above. Use that object to estimate the diameter of the Earth’s shadow.
(c) Calculate the ratio of the diameter of the Moon to the diameter of the Earth’s shadow using your values from parts (a) and (b). Hint: your answer should be less than 1.
(d) If we assume the diameter of the Earth is the same size as the diameter of the Earth’s shadow, we can calculate the diameter of the Moon from the ratio in (c) and the actual diameter of the Earth (as approximately determined by Eratosthenes in 200 BC). Do this estimation. Hint: set up an equation: diam from (a)/diam from (b) = ans to (c) = (actual diam of Moon) / (actual diam of Earth)
(e) How close is your result to the actual diameter of the Moon? Calculate the % difference: % diff = (actual – estimated) / actual
(f) Which of the 2 images do you think was easier to use to measure the Earth’s shadow diameter? Why?

5.2 Go to:
https://en.wikipedia.org/wiki/Lunar_phase
Watch the movie of the Moon's phases at the upper right. (a) What do you notice? (b) Are there things that we have not talked about in class that you see happening? (c) What do you see that confirms what we have said about the phases of the Moon in class?

5.3 Go to the Eclipses "Interactive" on-line at the textbook website:
The "Eclipse Interactive" is in the first alphabetical list -- just scroll down to "E"
Answer each of the first 6 questions in the "Exercises" (in your own words -- don't just copy the answers given).
1. where is Moon in orbit during solar eclipse? lunar eclipse?
2. what is phase of Moon during solar eclipse? lunar eclipse?
3. what does Jane Astronaut on Moon see during solar eclipse? lunar eclipse?
4. consider effect of tilt of orbit set to 0º, set to 3º. Are there eclipses? How often?
5. actual tilt is 5º, should we have eclipses?
6. actual tilt is 5°, why do we have eclipses?  
Bonus: 7. what would happen if the the Moon were 20% larger? 20% smaller?

5.4 How does the nebular/planetesimal theory of planet formation account for many of the 
craters on solid surfaces of moons and planets in our solar system?

5.5 planet dist vs. temp  Bennett et al., ch. 7, p. 221, #40 (a) only.

5.6 planet data  Bennett et al., ch. 7, p. 221, #41.

5.7 moon formation  Bennett et al., ch. 8, p. 240, #12.

5.8 (a1) Measure the diameter of Saturn in centimeters along the equator in Fig. 11.3, p. 321. 
(a2) Now measure the diameter of Saturn in centimeters from North Pole to South Pole in the 
same image.
(b) If we wanted to make a scale model of Saturn where the smaller actual diameter was equal to 
30 cm in the model, what would the larger diameter be?