Make sure you answer every part of the question. Write out your answers (neatly!) and bring them to class on Tuesday. If you have questions about the assignment you may email them to me in good time.

A. Explain the following astronomical phenomena using the two sphere model. (That is, using the idea that the Earth is fixed and the stars rotate around it on an axis passing through the North and South Poles, with the Sun, Moon, and planets orbiting the Earth.) Use a diagram if you feel that would help.
   i. The nightly motion of the stars from East to West.
   ii. The changing length of the day throughout the year, with the longest day falling on the Summer Solstice and the shortest day on the Winter Solstice.
   iii. The phases of the Moon.
   iv. Lunar eclipses.

B. The extracts from On the Heavens (given in CR Ch. 3 p. 85) give some of Aristotle's reasons for thinking the Earth is spherical. He gives an argument from physical principles and also from empirical observations.
   i. First, put the argument from his physics into premise-conclusion form.
   ii. What observations "from the evidence of the senses" does Aristotle make in support of the idea that the Earth is spherical?
   iii. Put the argument from one of these observations into premise-conclusion form (the conclusion being that the Earth is spherical).
   iv. Do both the arguments you have written out stand up to modern scrutiny? If so, explain why. If not, explain why not.

   (For the purposes of this question, take the Earth to be spherical so that the conclusion is true. We do not think the Earth is perfectly spherical today, but it is roughly spherical. Today, we would say that the Earth is an oblate spheroid – a sphere that has been squashed so that its circumference around the Equator is larger than its circumference around the Poles.

C. Look at Ptolemy's argument for the Earth being motionless (CR Ch. 3, p. 86). (NB In class, I erroneously attributed this quotation to Aristotle. It is Ptolemy's, although Aristotle says similar things.) Now look at Oresme's counterargument (FH Reading, p. 166-8), and Copernicus' counterargument (FH Reading, p. 173-4).
   i. What reasons do they give for thinking the rotation of the Earth may be preferable to the rotation of the stars?
   ii. Oresme suggests an experiment one could perform on a boat: watching someone move their hand downward in line with the vertical mast. Draw two diagrams that show what you would see (i.e. the path taken by the hand) if you were (a) standing on the boat, and (b) standing on the dock as the boat went past.
   iii. If you were kidnapped and woke up in a soundproofed room on a boat with no windows, would you be able to find out whether the boat was either (a) motionless or (b) moving with constant speed on calm seas? If so, what experiment would you perform? If not, why not?