Your name: _____

Arvind Borde

AST 9: Homework 5

1] Can the sun ever be overhead at the north pole? Why or why not?

2] What is latitude? What are the tropics of cancer and capricorn? (You may look these up if you wish.) Is there a connection between the latitudes of these tropics and something we have discussed in class?

3] Is the earth slightly flattened at the poles or at the equator?

4] We have seen that the earth's core has two parts, inner and outer. Are they both solid? Both liquid? What is their nature?

5] The outer core is made up of iron and nickel. Is your experience of them that they are usually solid or liquid? The temperature of the outer core is between 4 and 5.5 thousand degrees celsius (4,000–5,500° C). How might that temperature affect whether the outer core is solid or liquid? (Try to be precise and look up any information that might be pertinent.)

6] This requires a bit more thought/googling than the previous. The inner core is also composed of iron and nickel and is at a temperature of roughly 5,500° C. What additional factor might make its nature (solid v. liquid) different from the outer core?

7] What observations allow us to conclude that the earth might have liquid in its core?

8] What is the main method used to determine the age of the earth? Are there any hidden assumptions in the method?

9] If you have 24 grams of a radioactive substance and it takes 100 years for it to decay to 12 grams, how many further years will it take to decay to 3 grams? Will it, in principle, ever decay completely (to 0 grams)?

10] Is the earth's atmosphere mainly light gases or heavy? Why?

11] What layer of the atmosphere chiefly protects us from harmful radiation? How high is it? What layer is useful in communication? How high is it?