

Astronomy 305: Life in the Universe
Homework 2: Chapter 2

Total points: 55

1. [6 pts] Describe at least three characteristics of Greek thinking that helped pave the way for the development of modern science. Include some points made in the lecture.
2. (10 pts) [a] Describe Kepler's first two Laws of Planetary Motion. [b] In what sense did these laws provide us with a far more accurate model of planetary motion than either the models of Ptolemy or Copernicus?
3. (5 pts) What is the difference between a hypothesis and a theory in science?
4. (5 pts) What is Occam's razor? Give an example of how it applies.
5. (2 pts) In the Greek geocentric model, the retrograde motion of a planet occurs when
 - (a) Earth is about to pass the planet in its orbit around the Sun;
 - (b) the planet actually goes backward in its orbit around Earth;
 - (c) the planet is aligned with the Moon in our sky.
6. (2 pts) How did the Copernican revolution alter perceptions of the ancient Greek debate over extraterrestrial life?
 - (a) It showed that Aristotle's argument for a unique Earth was incorrect.
 - (b) It showed that the atomists were correct in their belief in an infinite cosmos.
 - (c) It proved that extraterrestrial life must really exist.
7. (10 pts) [a] Write down the three hallmarks of science. [b] Does the result of an experiment need to be reproducible for it to be considered scientific? Yes/no... Explain Why?
8. (15 pts) [a] Draw and clearly label the flow chart of hypothesis driven science (Fig 2.13). [b] Can a hypothesis ever be PROVED correct? Explain. [c] What do we call it when a hypothesis has never been proved incorrect?