Study questions on Plato (*Timaeus* and commentary - Huggett, Chapter 1)

1. What are the three types of things that Plato mentions?
2. Why must the thing upon which the imprints are to be formed be totally devoid of any characteristics?
3. Which of the three things mentioned in (1) does Plato identify with space? (Note: the reading has been edited in a slightly misleading way here.)
4. What are some characteristics of space, according to Plato?
5. According to Plato, can space act on physical objects?
6. How does Huggett define a valid argument?
7. What is Huggett's definition of a scientific theory? According to Huggett, what makes a theory good?

Study questions on Euclid (*The Elements* and commentary - Huggett, Chapter 2)

1. How does Euclid define a point? A line? A right angle?
2. What are Euclid's five postulates?
3. According to Postulate 32, the interior angles of any triangle are equal to what?
4. What does it mean to say that a line is a dense collection of points?
5. How can Euclidean geometry be thought of as a theory of space? In what sense can it immediately be said to be a "good" theory of space?
6. How can Gauss' Experiment be thought of as a confirmation of Euclidean geometry thought of as a theory of space? Suppose you think Euclidean geometry is not true of the actual world. How could you respond to the outcome of Gauss' Experiment?

Study questions on Zeno (Huggett, Chapter 3)

1. Describe Zeno's first argument against the possibility of motion (the Dichotomy argument).
2. According to Aristotle, what are the two ways in which a time interval or a line segment can be infinite?
3. How does Aristotle use the distinction made in #2 as a response to Zeno's first argument against the possibility of motion? Why does Aristotle think this is not an adequate response?
4. How does Aristotle argue for the possibility of having a finite length of time composed of an infinite number of time intervals?
5. Describe Zeno's "Achilles" argument against the possibility of motion.
6. According to Zeno, why is a flying arrow motionless? Why does Aristotle think this is false?
7. Describe Zeno's fourth argument against the possibility of motion. (Note: the translation is a bit misleading.)
8. Describe the argument Zeno gives against plurality (Fr. 13).
9. Which premise in Huggett's reconstruction of the Dichotomy argument can we reject without having to reject Euclidean geometry?
10. What is Cauchy's definition of an infinite sum? How does this resolve the Dichotomy argument?
11. Why can't we use Cauchy's definition of an infinite sum to conclude that the length of a line segment comprised of dimensionless points is zero?
12. Why can't the length of a finite line segment depend on the number of points that make it up?
13. According to Huggett's reconstruction of Zeno's Arrow Paradox, why is motion during an instant impossible?
14. How does the "at-at" theory of motion reconcile the claim that motion during an instance is impossible with the claim that motion in general is possible?
15. At any given instant *t*, how can the "at-at" theory of motion distinguish between an arrow in motion versus an arrow at rest?

Study questions on Aristotle (*Physics*, *On the Heavens* and commentary - Huggett, Chapter 4)

Physics

1. What two reasons does Aristotle give for why the concept of place is so important?
2. Why does Aristotle think the place an object occupies must be different from the object itself?
3. In what way does place exert an influence on objects?
4. According to Aristotle, in what sense could place be the form of an object? In what sense could place be the matter comprising an object?
5. Why does Aristotle think place cannot be either the form or the matter associated with an object?
6. Why does Aristotle think place cannot be the "extension between the extrimities" of an object?
7. What, finally, does Aristotle take place to be?
8. What does it mean to say that the place of a thing is the "innermost motionless boundary" of what contains it?
9. According to Aristotle, why does the World have no place?

On the Heavens

10. Why does Aristotle think there cannot be a fourth dimension?
11. According to Aristotle, what movements constitute simple locomotion?
12. What two simple bodies move by nature away from the center? What two simple bodies move by nature toward the center?
13. Why must there be, in addition to the four simple bodies in #12, a fifth simple body whose natural motion is in a circle?
14. Why is the fifth simple body whose natural motion is in a circle "more divine and prior to" the other four simple bodies?
15. According to Aristotle, why can't there be more than one World?
16. Why does Aristotle claim there is no such thing as infinite (i.e., unlimited) motion?
17. According to Aristotle, why is the world (i.e., the universe) spherical and not egg-shaped?
18. According to Aristotle, why is the Earth motionless and at the center of the universe?