Philosophy 405: Knowledge, Truth and Mathematics Hamilton College
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Reading Guide #3
Aristotle, *Metaphysics* XIII.1-3
Aristotle, *Physics* II.2
Lear, "Aristotle's Philosophy of Mathematics"

Aristotle, *Metaphysics* XIII.1-3

1. Why can't mathematical objects exist in sensible things?
2. Why can't mathematical objects exist separate from sensible things?
3. Why are geometric objects not substances?
4. Given that mathematical objects do not exist in substances or separate from substances, does it follow that they do not exist at all? Explain.
5. "It is true...to say, without qualification, that the objects of mathematical exist, and with the character ascribed to them by mathematicians" (*Metaphysics* XIII.3: 1077b31-3). Explain.
6. Explain the analogy between mathematics and the study of health.
7. How do mathematicians suppose separate what is not separate?

Aristotle, *Physics* II.2

1. How do mathematicians *not* treat of physical objects?
2. What is separation? How do mathematicians separate? How do Platonists separate?

Lear, “Aristotle’s Philosophy of Mathematics”

1. What is the standard interpretation of Aristotle’s philosophy of mathematics? Why has it seemed unsatisfactory?
2. Are mathematical objects in physical bodies? Explain.
3. In what way do mathematicians study physical objects?
4. Why is a generalized theory of proportions embarrassing to the Platonist? What lesson does Aristotle draw from the generalized theory of proportions?
5. Describe the qua operator Lear attributes to Aristotle. How does it place the mathematician behind a veil of ignorance?
6. How does the mathematician apply the qua operator? How does this use affect the distinction between essential and incidental properties?
7. Are mathematical objects separable? Are they thus platonic forms?
8. What fiction do mathematicians assume?
9. What evidence supports the claim that Aristotle believed that physical objects do not instantiate mathematical properties? How does Lear respond?
10. How can Lear’s view accommodate knowledge of geometric objects with no physical instantiation?
11. Do perceptible objects have intelligible matter? What would Plato say?
12. Why is an account of arithmetic more difficult for Aristotle than an account of geometry?
13. How does the use of the qua operator differ in Lear’s account of Aristotle’s arithmetic and his geometry?
14. Is Aristotle’s account of our knowledge of mathematics subjective?
15. Why is set theory problematic for Lear’s account?
16. “There is the plausible belief that mathematical theorems are true irrespective of whether there is any physical instantiation of them” (186). Why is this a problem for Aristotle?
17. How is geometry, for Aristotle, a conservative extension of physical theory?
18. How does Aristotle’s theory of mathematics provide a bridge between physical theory and pure mathematics?
19. How does Aristotle allow us to think of mathematical sentences as being true and false without mathematical objects existing?