

# Reading Guide for Sections 1.1, 1.2, and 1.4

## Mathematics 308—Modern Geometry

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**Directions:** Read Sections 1.1, 1.2 and 1.4 in your text, and answer the following questions based on the reading.

1. The author quotes J.L. Heilbron, who claims that “We owe geometry to the tax collector.” Explain what Heilbron meant by that statement.
2. According to the author, there were practical reasons for using geometric shapes such as rectangles and circles. In particular, he states that circular huts “provide maximum living space for the area they enclose.” What does he mean to say here? That circular huts provide maximum area for the area they enclose? That makes no sense; so, rephrase his statement so that it makes sense and is accurate.
3. The author states that the Egyptians had a more empirical understanding of geometry and the Greeks a more abstract understanding. Explain what the author means by this.
4. According to the author, what is the main advantage over the Egyptians that the Greeks had because of their abstract understanding of geometry?
5. Tell when and where did Thales lived, and identify at least 3 major contributions he made to humanity.
6. Tell when and where did Pythagoras lived, and identify at least 3 distinguishing characteristics of his school of thought.
7. What was begun by the schools of Thales and Pythagoras but not perfected until Euclid in about 300 B.C.?
8. What type of perfection did the ancient Greeks pursue that led to the development of the Axiomatic Method?
9. What two logical traps are inherent in the development of any axiomatic system?
10. How did the Greeks overcome these two challenges?
11. Draw an analogy between the relationship of theorems to axioms and the relationship of defined terms to undefined terms.
12. List all of Euclid’s assumptions (i.e. his postulates/axioms and his common notions).
13. According to the author, the great insight among the Greeks concerning an abstract axiomatic system was what?
14. Briefly describe the point/counter-point dialogue between Epicurus and Proclus concerning Euclid’s work.
15. Explain briefly the work of David Hilbert.
16. Complete Exercise 1.4.1 on page 23 of your text.