

Test #1, Part #1
Mathematics 308—Modern Geometry
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Directions: On a separate sheet of paper, neatly answer the following questions.

1. **Inductive vs. Deductive Reasoning:** List the five main differences between inductive and deductive reasoning.
2. **Short Answers:**
 - (a) “Education involves moving from improper to proper knowledge,” says Anthony Rizzi in his book, *The Science Before the Science*. Define *proper* and *improper* knowledge.
 - (b) In the section of the class notes entitled, *What Is Rigor?*, we identified three elements that a proof should possess. List them.
 - (c) Fill in the missing words in this quote from the MN BOT Standards for Mathematics Education: “Students need to understand that while are verified by observation, they are established as universally true only by recourse to .”
 - (d) The discovery of knowledge in library in place led to a revival of ancient knowledge in Europe known as ?
 - (e) In developing methods for tracking the movements of the stars and other celestial bodies, the ancient Babylonians developed a rudimentary understanding for what we know today to be mathematical discipline?
 - (f) In contrast to the Egyptians, who viewed mathematical knowledge as sacred and belonging only to a high priestly class, the Greeks promoted , which led to a rich and varied body of knowledge about philosophy, mathematics, and the natural world?
 - (g) The role of mathematics is not to establish the truth value of specific statements as they relate to the real world. Rather, mathematics concerns itself with the truth value of ?
 - (h) The re-discovery of the writings of ancient Greek philosopher caused intellectuals in medieval times to argue against the science of the High Middle Ages and Christianity in general, causing a monk by the name of Thomas Aquinas to write a book in which he argued that the two forms of knowledge were compatible?
3. **Short Paragraph Answers:**
 - (a) To illustrate the need for rigor, identify a conjecture that defies our intuition but has recently been proven or, with the advent of technology, has been disproven.
 - (b) Briefly describe the role of the Muslims in the history of geometry. (Be sure to include how their conquest of much of the ancient world and the dictates of their own religion influenced their role.)
 - (c) Briefly explain how to argue from a picture in a way that guarantees the logical validity of your argument.
4. **Short Paragraph Answers with Choice:**
 - (a) For *two* (2) of the following contributors to geometry, briefly (in a sentence or two) describe their main contribution(s).
 - Thales (624-547 B.C.)
 - Hippocrates (460-375 B.C.)
 - Archimedes (287-212 B.C.)
 - Eratosthenes (274-194 B.C.)
 - (b) For three (3) of the following ideas, events, places, or people, briefly (in a sentence or two) describe their significance and/or contribution in the historical development of geometry (or mathematics in general).
 - Rope Stretchers
 - Ionian School in Miletus
 - Pythagorean School in Samos
 - Aristotelean vs. Platonic thought