

Section 1.2

Greek Number Theorists

Who: Pythagoras, Euclid, Eratosthenes, Diophantus

What: The birth of number theory

When: 582 BC to 284 AD

With the rise of the Greek civilization, essentially just a collection of small “city-states” along the rocky shores of the eastern Mediterranean Sea, we see the beginnings of abstract learning. The people were relatively safe from attackers (due to the terrain), wealthy (prime location for trade with rest of the world), and had exposure to most knowledge of earlier civilizations (especially Egypt and Babylon). From these roots, a culture developed in which knowledge was pursued to better understand philosophical issues.

Pythagoras spent his early days traveling, spending time in Egypt, the Far East, and perhaps even a Babylonian prison. During this time, he became fascinated by numbers and their meanings/properties. In his later life, he returned to Greece, and founded a society/school/cult in which he instructed others in the “quadrivium”; namely, arithmetic, music, astronomy, and geometry. [To this the “trivium” of rhetoric, grammar, and logic was added in the Middle Ages forming the European base of a liberal arts education.] Of particular interest to the Pythagoreans were the mythical properties of the integers. They also initiated the study of amicable numbers, perfect numbers, deficient/abundant numbers, figurate numbers, and Pythagorean triples.

Alexander the Great established the city Alexandria (named for himself) and wanted it to be the center of intellectual activity. The first mathematician at the academy there was Euclid. He wrote perhaps the second most influential book of all time after the Bible. *The Elements* by Euclid has been translated into more languages than any book other than the Bible and it was the standard geometry text for the next 2000 years. Think about that.

Eratosthenes, or “beta”, was a very diverse contributor to mankind. He was acclaimed as a geographer, mathematician, astronomy, historian, poet, and athlete.

The last great Greek mathematician before the “decline” of the culture was Diophantus. His text *Arithmetica* was a treatise on number theory and it was in a Latin translation that Fermat made his famous note.