The history of Mathematics science pioneered by ancient Greek.

Abstract

Greek mathematics refers to mathematical literature and concepts originating from the Archaic to the Hellenistic and Roman periods, which are mostly extant from the 7th century B.C. to the 4th century A.D. in the Eastern Mediterranean. Greek mathematicians resided in towns across the whole Eastern Mediterranean, from Italy to North Africa, yet they were unified by their culture and language. The term "mathematics" originates from Ancient Greek. The study of mathematics for its own purpose and the application of broad mathematical theories and proofs distinguish Greek mathematics from the mathematics of earlier cultures.

I. Introduction

Ancient Greek mathematicians made a monumental contribution to world philosophy and all practical disciplines that depend on an intellectual foundation, including geometry, engineering, astronomy, and design. Greek mathematicians, initially influenced by the Egyptians, would go on to make breakthroughs such as Pythagoras' theory of right-angled triangles and bring clarity and precision to age-old mathematical problems by focusing on the abstract. Their solutions provided the fundamental mathematical pillars upon which all subsequent mathematicians and scientists have built up until the present day.

Origins of Greek mathematics

The origins of Greek mathematics are not widely recorded. The Minoan and subsequent Mycenaean civilizations developed in Greece and Europe throughout the second millennium BCE. While these civilizations had writing and were capable of great engineering, such as four-story palaces with drainage and beehive graves, they left no mathematical texts behind. Though no direct proof exists, it is widely assumed that the adjacent Babylonian and Egyptian civilizations influenced the younger Greek tradition. Unlike the flowering of Greek literature from 800 to 600 BC, nothing is known about Greek mathematics in this early period—nearly all of the material was handed down via subsequent writers starting in the mid-4th century BC.

Archaic and Classical periods

Apparently, Greek mathematics originated with Thales of Miletus (c. 624–548 BC). It is widely accepted that he was one of the Seven Wise Men of Greece, but very little is known about his life and activities. According to Proclus, he proceeded to Babylon to study mathematics and other disciplines, where he developed the evidence for what is now known as Thales' Theorem.

Equally mysterious is Pythagoras of Samos, who allegedly visited Egypt and Babylon before settling in Croton, Magna Graecia, and establishing a cult. Pythagoreans believed that "everything is a number" and actively sought mathematical relationships between numbers and objects. Many subsequent discoveries, like the building of the five regular solids, were attributed to Pythagoras. However, Aristotle declined to ascribe anything to

Pythagoras and instead emphasised the collective activity of the Pythagoreans.

It has been traditional to assign over half of the content of Euclid's Elements to the Pythagoreans, along with the discovery of irrationals to Hippassus and the first effort to square the circle to Hippocrates of Chios. Archytas, who solved the issue of doubling the cube, established the harmonic mean, and probably contributed to optics and physics, may have been the group's finest mathematician. Theodorus, Theaetetus, and Eudoxus were other active mathematicians during this time period who were not affiliated with any one school.

During the Classical era, philosophers were also interested in Greek math. Plato, who started the Platonic Academy, talks about math in a number of his dialogues. Plato was not a mathematician, but he seems to have been influenced by Pythagorean ideas about numbers and to have thought that the elements of matter could be broken down into geometric solids. He also thought that the universe was held together not by physical or mechanical forces, but by its shapes. Aristotle, who started the Peripatetic school, used math to explain a lot of his ideas. For example, he used geometry to explain his theory about rainbows and the theory of proportions to explain how motion works. Much of what was known about ancient Greek math at this time came from records that Aristotle mentioned in his own writings.

Hellenistic and Roman periods

The Hellenistic period started in the fourth century BC with Alexander the Great's conquest of the eastern Mediterranean, Egypt, Mesopotamia, the Iranian plateau, Central Asia, and portions of India, resulting in the spread of Greek language and culture. Greek became the language of academia across the Hellenistic globe, and Classical mathematics fused with Egyptian and Babylonian mathematics to become Hellenistic mathematics.

During the Hellenistic and early Roman periods, Greek mathematics and astronomy reached their pinnacle, and much of the work represented by scholars such as Euclid (fl. 300 BC), Archimedes (c. 287-212 BC), Apollonius (c. 240-190 BC), Hipparchus (c. 190-120 BC), and Ptolemy (c. 100-170 AD) was of a very advanced level. There is also evidence of mixing mathematical knowledge with technological or practical applications, as shown in the building of analogue computers like the Antikythera mechanism, Eratosthenes' (276 - 194 BC) exact measurement for the circumference of the Earth, or Hero's mechanical achievements (c. 10–70 AD).

Several Hellenistic learning institutions arose during this time, the most notable of which was the Musaeum in Alexandria, Egypt, which drew academics from all across the Hellenistic world (mostly Greek, but also Egyptian, Jewish, Persian, Phoenician, and even Indian scholars). Despite their small number, Hellenistic mathematicians regularly corresponded with one another; publishing included passing and duplicating someone else's work among peers.

Later mathematicians include Diophantus (circa 214–298 AD), who wrote about polygonal numbers and a work on pre-modern algebra (Arithmetica), Pappus of Alexandria (circa 290–350 AD), who put together the

Collection, a collection of many important results, and Theon of Alexandria (circa 335–405 AD) and his daughter Hypatia (circa 370–415 AD), who edited Ptolemy's Almagest and Except for Diophantus, none of these mathematicians are known for their original works. Instead, they are known for their commentaries and explanations. These commentaries have kept important parts of lost works or historical references that, without the original documents, are more valuable because they are so rare.

The majority of Greek mathematical works have been preserved by the centuries-long copying of manuscripts; nonetheless, ancient pieces have been discovered in Greece, Egypt, Asia Minor, Mesopotamia, and Sicily.

Accomplishments

Greek mathematics is a significant time in the history of mathematics, being crucial in terms of geometry and the concept of formal proof. Greek mathematicians also made contributions to number theory, mathematical astronomy, combinatorics, mathematical physics, and, on occasion, concepts similar to integral calculus.

Eudoxus of Cnidus created a proportion theory that resembles the present theory of real numbers based on the Dedekind cut, which was established by Richard Dedekind, who recognised Eudoxus as an influence.

Archimedes used the notion of the endlessly tiny in a manner that foreshadowed current conceptions of integral calculus. He could achieve solutions to questions with an arbitrary degree of precision while describing the bounds within which the answers resided using a strategy based on a kind of proof by contradiction. This methodology is known as the method of exhaustion, and he used it in numerous of his writings, including estimating the worth of (Measurement of the Circle). Archimedes demonstrated in Quadrature of the Parabola that the area contained by a parabola and a straight line equaled 4/3 the area of a triangle with equal base and height using an infinite geometric series whose total was 4/3. Archimedes addressed the idea that the number of grains of sand was too enormous to count in The Sand Reckoner by attempting to name how many grains of sand the cosmos might hold, establishing his own counting technique based on the myriad, which represented 10,000.

The theory of conic sections, which was predominantly established during the Hellenistic era, may be the most distinctive output of Greek mathematics. The techniques used made no explicit use of algebra or trigonometry, both of which first appeared around the time of Hipparchus.
Ancient Greek mathematics was not restricted to theoretical works, but was also applied in practical tasks such as commercial transactions and land measurement, as indicated by preserved writings in which computational techniques and practical concerns played a more prominent part.

Conclusion
Ancient Greeks provided great contributions to many sciences particularly in Mathematics. Indeed, these contributions helped us in current times such as the huge uses and applications of the rule of Pythagoras. In addition to the accomplishments of Archimedes, he Archimedes investigated the spiral (Archimedes Spiral) and discovered

formulae for the volumes of the parabola, ellipse, and hyperbolic paraboloid. He devised a clever way for expressing very huge numbers. Notably, Greek Mathematics reached its peak in the silver age, where ancient Greek mathematics entered its Silver Age between 250 and 350 A.D. During this time, Diophantus made significant strides in algebra, specifically indeterminate analysis. The term for this is Diophantine Analysis. A Diophantine equation is identical to a polynomial.
After the end of this period of ancient Greece, scientific and mathematical advancements cease.

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