Early Greek Mathematics

From around 600 BC, mathematics and astronomy flourished in the Greek-speaking world of the eastern Mediterranean. During this time, the Greeks developed the concept of deductive logical reasoning that became their hallmark, especially in geometry.

In 585 BC, **Thales of Miletus** predicted a solar eclipse. In geometry he applied congruent triangles to navigation at sea. He is credited with proving that two angles of an isosceles triangle are equal and that a circle is bisected by a diameter.

Around 572 BC, **Pythagoras** was born on the Aegean island of Samos, and he emigrated to the Greek seaport of Crotona (now in Italy) where he founded a brotherhood to further the study of mathematics, philosophy, and the natural sciences. The Pythagoreans reportedly believed that “All is number,” emphasizing the “mathematical arts” of arithmetic, geometry, astronomy, and music. He gives his name to the **Pythagorean theorem** on right-angled triangles, although Pythagorean triples were known in Mesopotamia 1000 years earlier.

Democritus (c. 460–370 BC) was also interested in geometry, investigating cones and pyramids by splitting them into “indivisible” sections by parallel planes. He is mainly known for proposing that matter consists of small indivisible particles called atoms.

From 500 to 300 BC, Athens was the intellectual centre of Greece. In 480 BC, the Acropolis, the “highest city of ancient kings,” was devastated by a Persian invasion. When the city was rebuilt, the **Parthenon** was added: constructed on mathematical principles, it is surrounded by columns of white marble.

Around 387 BC, **Plato** founded his Academy, which soon became the focus for mathematical and philosophical study. Over the entrance was inscribed: “Let no-one ignorant of geometry enter here.” Plato believed that mathematics and philosophy provided the finest training for those holding positions of responsibility in the state. In his *Republic*, he expounded on the Pythagoreans’ mathematical arts, justifying their importance for the “philosopher-ruler.” His *Timaeus* includes a discussion of the five regular solids.

Aristotle joined the Academy at the age of 17 and stayed there for 20 years until Plato’s death in 347 BC. Fascinated by logical questions, he systematized the study of logic and deductive reasoning; in particular, he discussed syllogisms, and alluded to a proof that $\sqrt{2}$ is irrational. In Raphael’s fresco *The School of Athens*, Plato and Aristotle are pictured on the steps of the Academy; Plato is holding a copy of *Timaeus* while Aristotle carries his *Ethics*.

Thales

Pythagoras

Pythagorean theorem

Democritus

Parthenon

Plato and Aristotle

➤ Please send all submissions to the Stamp Corner Editor,

Robin Wilson, Pembroke College,

Oxford, OX1 1DW, UK

e-mail: rj.wilson@open.ac.uk