The Contribution Of Greek And Roman Civilization To The Development Of Mathematics

When the empire of the Greek began to spread all over the world especially into Asia, the Greeks were so clever and smart that they could adopt and adapt useful factors or elements from the communities they invaded. In fact they adapted many elements of mathematics from both the Babylonians and the Egyptians. However , the Greek began at once to develop and to make important contributions in the field of mathematics . One of these contributions is one of the most outstanding revolutions on mathematics during the Hellenistic Period .

The Hellenistic period had a period in ancient history in which Greek culture was rich in many aspects of civilization at that time. It started after the death of Alexander the Great in 323 BC, and lasted about 200 years in Greece and about 300 years in the Middle East

What are these contributions ?

Philosophy and Mathematics

The most famous figure of the 6th Century BCE mathematicians was definitely Pythagoras of Samos , a Greek island in the Aegean Sea, close to the coast of western Turkey. Indeed, Pythagoras is believed to be the first to coin both the words “philosophy” (“love of wisdom“) and “mathematics” . He was perhaps the first to know that geometric elements corresponded with numbers so he could construct or build a complete system of mathematics Pythagoras’s Theorem (or the Pythagorean Theorem) is one of the best known of all mathematical theorems.

Thales’ Intercept Theorem

Geometry was the most relevant aspect that controlled the Greek Mathematics . One of the cleverest mathematicians was Thales of Miletus . He was a Greek mathematician, astronomer and pre-Socratic philosopher from Miletus in Ionia, Asia Minor. He is usually considered to be the first to lay down guidelines for the abstract development of geometry.

Thales founded what has become known as Thales’ Theorem. This theory says if a triangle is drawn within a circle with the long side as a diameter of the circle, then the opposite angle will always be a right angle. Besides , he is known as Thales’ Theorem or the Intercept Theorem, about the ratios of the line segments that are created if two intersecting lines are intercepted by a pair of parallels (and, by extension, the ratios of the sides of similar triangles).

Attic or Herodianic numerals

The ancient Greek numeral system, known as Attic or Herodianic numerals, was fully developed by about 450 BCE, and in regular use possibly as early as the 7th Century BCE. It was a base 10 system similar to the earlier Egyptian one (and even more similar to the later Roman system), with symbols for 1, 5, 10, 50, 100, 500 and 1,000 repeated as many times needed to represent the desired number. Addition was done by totaling separately the symbols (1s, 10s,

100s, etc) in the numbers to be added, and multiplication was a laborious process based on successive doublings (division was based on the inverse of this process).

Three geometrical problems

These three geometrical problems were profoundly influential and effective on future geometry and paved the way to many useful and outstanding discoveries . Despite the fact that their actual solutions had to wait until the nineteenth Century . Three geometrical problems in particular could be solved by purely geometric means using only a straight edge and a compass, date back to the early days of Greek geometry: “the squaring (or quadrature) of the circle”, “the doubling (or duplicating) of the cube” and “the trisection of an angle”. Hippocrates of Chios was one such Greek mathematician who applied himself to these problems during the 5th Century BCE .His influential book “The Elements”, dating to around 440 BCE, was the first compilation of the elements of geometry, and his work was an important source for Euclid‘s later work.

Zeno’s Paradox of Achilles and the Tortoise

The most famous of his paradoxes is that of Achilles and the Tortoise, which describes a theoretical race between Achilles and a tortoise. Achilles gives the much slower tortoise a head start, but by the time Achilles reaches the tortoise’s starting point, the tortoise has already moved ahead. By the time Achilles reaches that point, the tortoise has moved on again, etc, etc, so that in principle the swift Achilles can never catch up with the slow tortoise. These paradoxes are based on the infinite divisibility of space and time, and rest on the idea that a half plus a quarter plus an eighth plus a sixteenth, etc, etc, to infinity will never quite equal a whole.

As just seen through the previous examples , the most important contributions of the Greeks , especially the figures Pythagoras, Plato and Aristotle , were all influential . They used the idea of the proof and the deductive method of using logical steps to prove or disprove theorems from initial assumed axioms. Plato who is best known for his description of the five Platonic solids established his famous Academy in Athens in 387 BCE . Aristotle’s work on logic was regarded as definitive for over two thousand years.