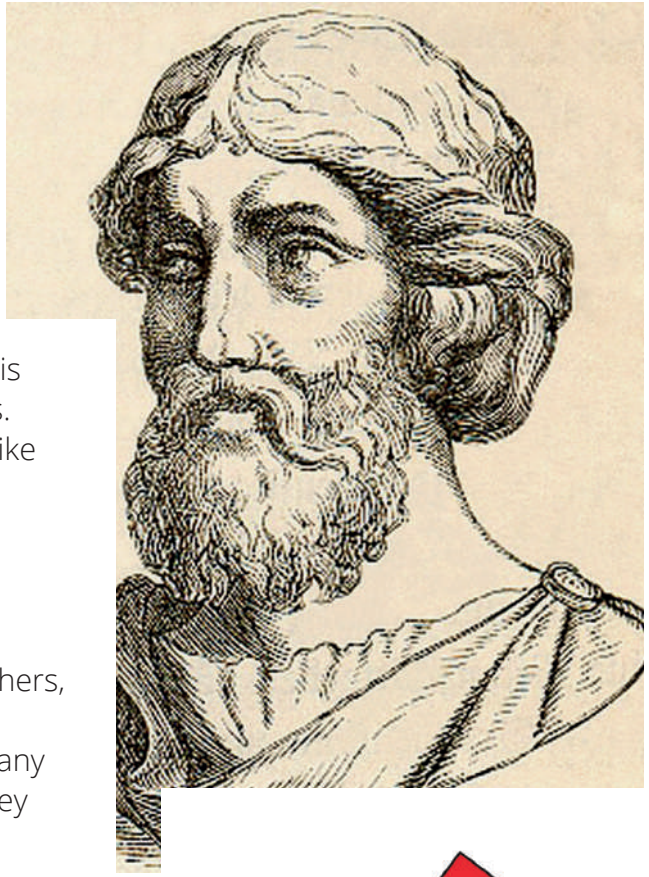
Pearson **Year 7 Term 1** Famous Mathematicians

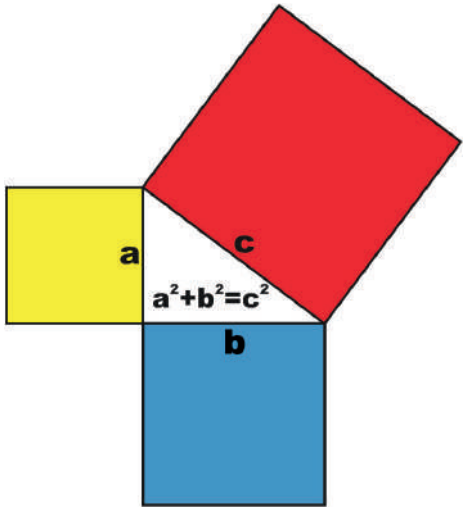
Pythagoras



Pythagoras of Samos was a famous Greek mathematician and philosopher (c. 570 – c. 495 BC). He is known best for the proof of the important Pythagorean theorem, which is about right angle triangles. He started a group of mathematicians, called the Pythagoreans, who worshiped numbers and lived like monks. He had an influence on Plato.

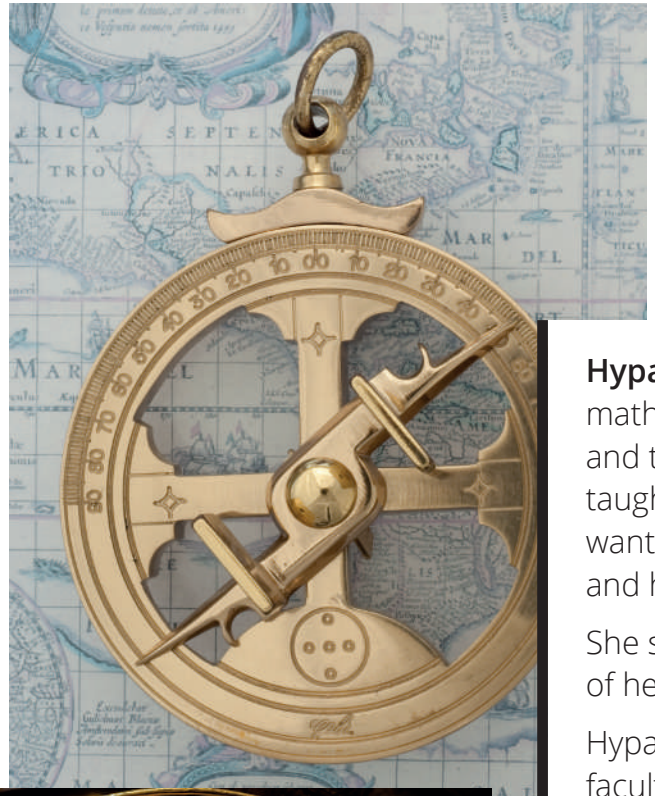
He had a great impact on mathematics, theory of music and astronomy. His theories are still used in mathematics today. He was one of the greatest thinkers of his time.

Pythagoras was born in Samos, a little island off the western coast of Asia Minor. There is not much information about his life. It is said that he had a good childhood. Growing up with two or three brothers, he was well educated. He did not agree with the government and their schooling, so he moved to Crotone and set up his own cult (little society) of followers under his rule. His followers did not have any personal possessions, and they were all vegetarians. Pythagoras taught them all, and they had to obey strict rules.



Questions:

1. Where was Pythagoras born?
2. Approximately how old was Pythagoras when he died?
3. Did he have any siblings?
4. What is Pythagoras' Theorem?
5. Which letter stands for the longest side in the right angled triangle?
6. Which two letters stand for the shorter sides in the triangle?
7. Pythagoras had a great impact on mathematics, and which other two areas?
8. Pythagoras moved to Crotone and set up a cult. What does cult mean?
9. His followers lived like monks and were vegetarians. What does this mean?
10. Pythagoras was born in 570 BC. What does BC mean?



Year 8 Term 1 Famous Mathematicians

Hypatia

Hypatia was a fortunate child, raised by her father, Theon of Alexandria, who was a teacher of mathematics at the Museum of Alexandria and a keeper of the library in Egypt. He was her tutor and teacher; he trained Hypatia in the fields of arts, literature, science and philosophy. She was also taught to work on her speech, which gave her the gift of being a great speaker. Hypatia's father also wanted to make sure she was physically fit and her physical education consisted of rowing, swimming and horseback riding.

She studied for some time in Athens where her talent for mathematics was proved; she excelled in all of her studies and became the greatest philosopher of her time.

Hypatia became a brilliant public speaker and scholar, and she followed her father on the library's faculty. There she wrote on mathematics and astronomy. She did work on algebraic equations and conic sections. She invented the astrolabe for ship navigation and devices for measuring the density of fluids.

Questions:

1. Who was Hypatia's tutor?
2. What did he teach Hypatia?
3. Where is Alexandria?
4. What did Hypatia do to keep fit?
5. Where is Athens?
6. Hypatia was brilliant at two things – what were they?
7. She wrote about two things – what were they?
8. In mathematics, she did work on algebraic equations and what else?
9. What did Hypatia invent?
10. What does density mean? Can you give an example of something that is very dense?

Pearson **Year 9 Term 1** Famous Mathematicians

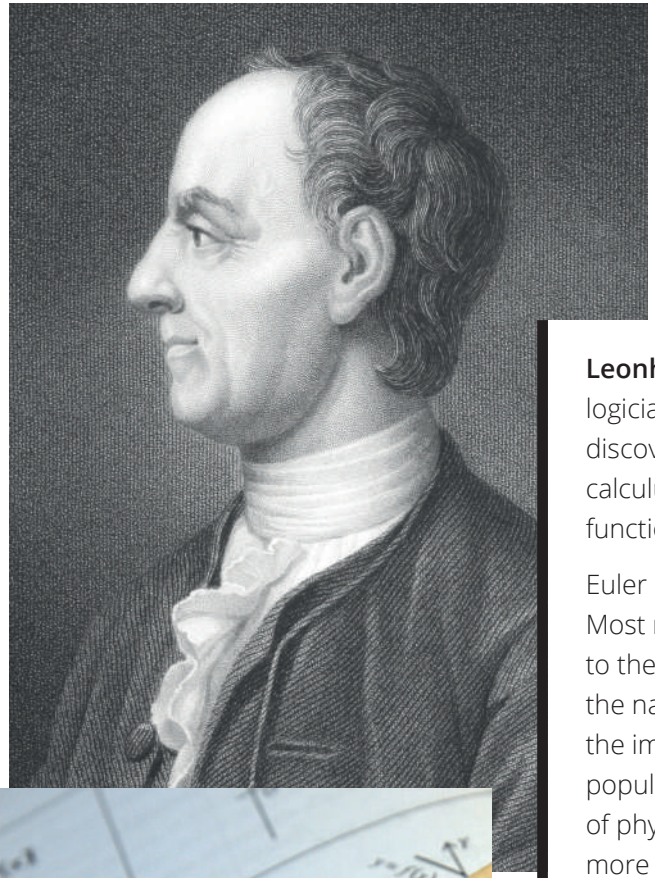
Cardano

Gerolamo Cardano 24 September 1501 – 21 September 1576 was an Italian polymath, whose interests and proficiencies ranged through those of mathematician, physician, biologist, physicist, chemist, astrologer, astronomer, philosopher, writer, and gambler. He was one of the most influential mathematicians of the Renaissance, and was one of the key figures in the foundation of probability and the earliest introducer of the binomial coefficients and the binomial theorem in the Western world. He wrote more than 200 works on science.

Cardano partially invented and described several mechanical devices including the combination lock, the gimbal consisting of three concentric rings allowing a supported compass or gyroscope to rotate freely, and the Cardan shaft with universal joints, which allows the transmission of rotary motion at various angles and is used in vehicles to this day. He made significant contributions to hypocycloids, published in *De proportionibus*, in 1570. The generating circles of these hypocycloids were later named Cardano circles or cardanic circles and were used for the construction of the first high-speed printing presses.

Questions:

1. How old was Cardano when he died?
2. He was proficient in many areas. What does proficient mean?
3. What does Renaissance mean?
4. He was one of the key figures in the foundation of probability. What is probability?
5. What is the probability of an event that is certain?
6. Cardano partially invented the combination lock. What could a combination lock be used for?
7. What does concentric mean?
8. What is rotary motion?
9. How might rotary motion be used in vehicles?
10. He contributed to the generation of hypocycloids, which were used to build the first high-speed printing press. Do we benefit from this now? How?

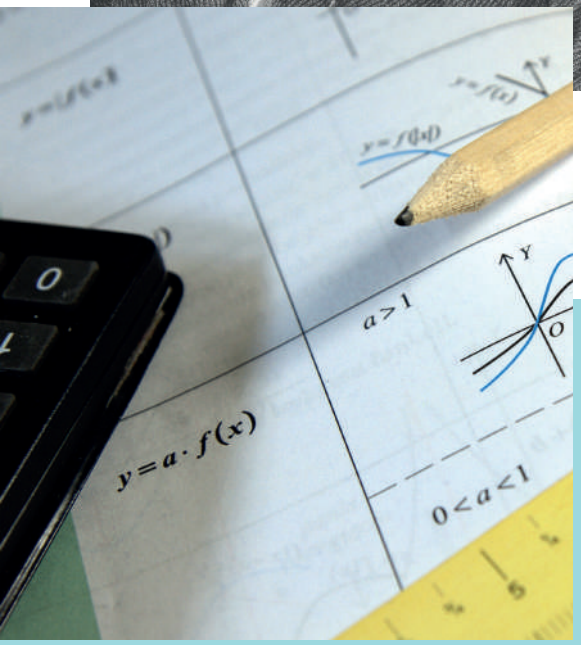


Year 10 Term 1 Famous Mathematicians

Euler

Leonhard Euler (15 April 1707 – 18 September 1783) was a Swiss mathematician, physicist, astronomer, geographer, logician and engineer who founded the study of graph theory and topology and made pioneering and influential discoveries in many other branches of mathematics such as analytic number theory, complex analysis, and infinitesimal calculus. He introduced much of modern mathematical terminology and notation, including the notion of a mathematical function.

Euler introduced and popularised several notational conventions through his numerous and widely circulated textbooks. Most notably, he introduced the concept of a function and was the first to write $f(x)$ to denote the function f applied to the argument x. He also introduced the modern notation for the trigonometric functions, the letter e for the base of the natural logarithm (now also known as Euler's number), the Greek letter Σ for summations and the letter i to denote the imaginary unit. The use of the Greek letter π to denote the ratio of a circle's circumference to its diameter was also popularised by Euler, although it originated with Welsh mathematician William Jones, Euler also revolutionised the field of physics by reformulating Newton's classic laws of physics into new laws that could explain the motion of rigid bodies more easily, and made significant contributions to the study of elastic deformations of solid objects. He also came up with Euler's formula, which links the number of faces, edges and vertices in a 3D shape. It is written F + V = E + 2.



Questions:

1. How old was Euler when he died?
2. What country did he live in?
3. What is a function?
4. What are the three main trigonometrical functions?
5. What is the Greek letter Σ used for in Maths?
6. What does circumference and diameter mean? Use a diagram to answer.
7. What is the formula connecting circumference, diameter and π?
8. Euler worked on Newton's laws of Physics. Can you state any of them?
9. What is Euler's formula?
10. What do F, V and E stand for?