Maths presentation

Pythagoras Theorem

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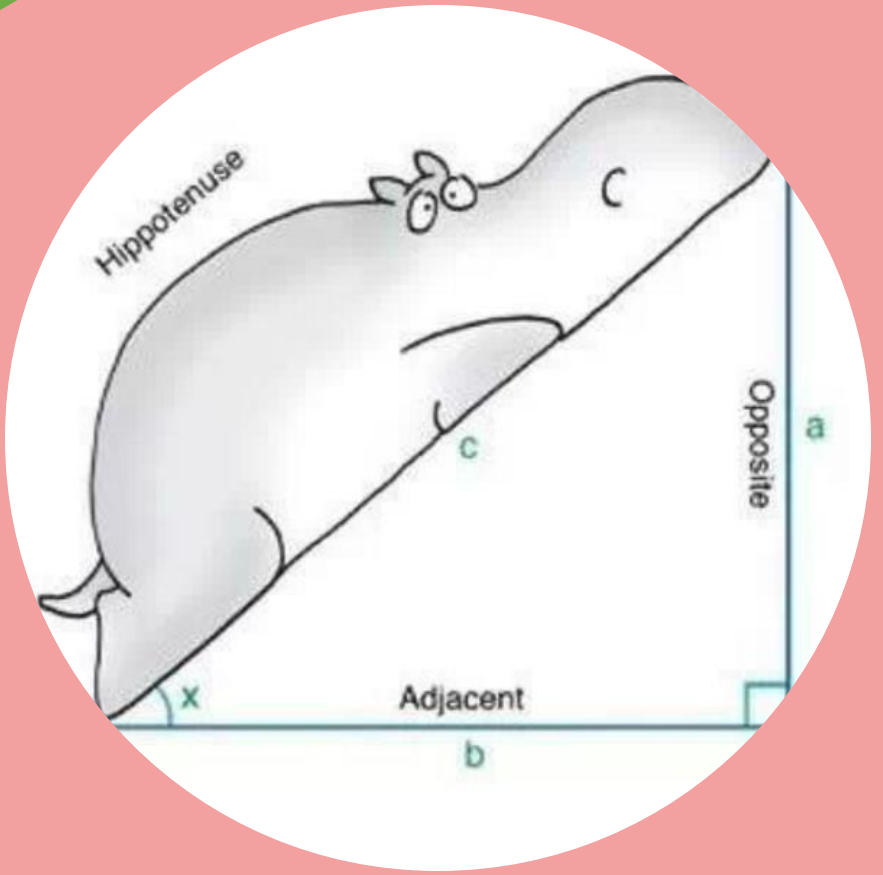
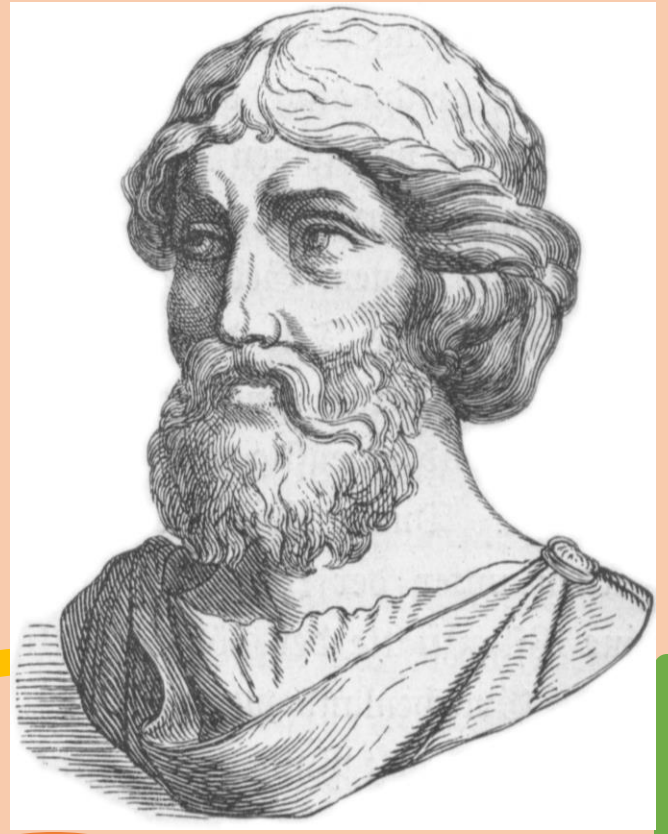
The history of the Pythagorean Theorem

- The Pythagorean theorem got its name from the ancient Greek mathematician Pythagoras, who was the first to provide the proof of this theorem . But it is believed that people noticed the special relationship between the sides of a right triangle, long before Pythagoras. This theorem helps us to figure out the length of the sides of a right triangle. The formula for it is $c^2 = a^2 + b^2$
- '*In any right triangle, the area of the square whose side is the hypotenuse (*the hypotenuse is the side opposite the 90 degrees angle in a right angle triangle , it is always the longest side*) is equal to the sum of the areas of the squares whose sides meet at a right angle.*



History of Pythagoras

- **Pythagoras of Samos** was a famous Greek mathematician. He was born in Samos, a little island off the western coast of Asia Minor. Growing up he had three brothers and was well educated. He is known best for the proof of the important Pythagorean theorem, which is about right -angle triangles. He has started a group of mathematicians, which were called the Pythagoreans. The worshipped numbers and lived like monks. Pythagoras has had a great impact on mathematics, the theory of music and astronomy. Pythagoras is most famous for his theorem. He said that the length of the longest side of the right-angle triangle called the hypotenuse squared would equal the sum of the other sides squared. And so $a^2 + b^2 = c^2$ was born.

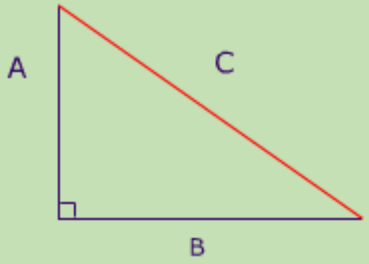


More on Pythagoras

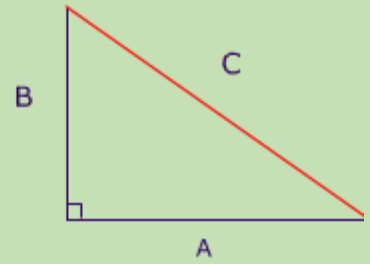
- Pythagoras had followers. A whole group of mathematicians signed up to be his pupils, to learn everything he knew, and to help him solve the great riddles of the universe. But this was more than just a group of people who liked math—it was a full-blown religion.
- Numbers, Pythagoras believed, were the elements behind the entire universe. He taught his followers that the world was controlled by mathematical harmonies that made up every part of reality. More than that, though, these numbers were sacred—almost like gods.
- The Pythagoreans had sacred numbers. Seven was the number of wisdom, 8 was the number of justice, and 10 was the most sacred number of all. The Pythagoreans had a symbol called the Tetractys. It was a triangle with 10 points across four rows, meant to symbolize the organization of space and the universe. Ten, they believed, was the number of the highest order, which contained the course of all mortal things. And they literally worshiped it. Every part of math was holy. What happened to it?

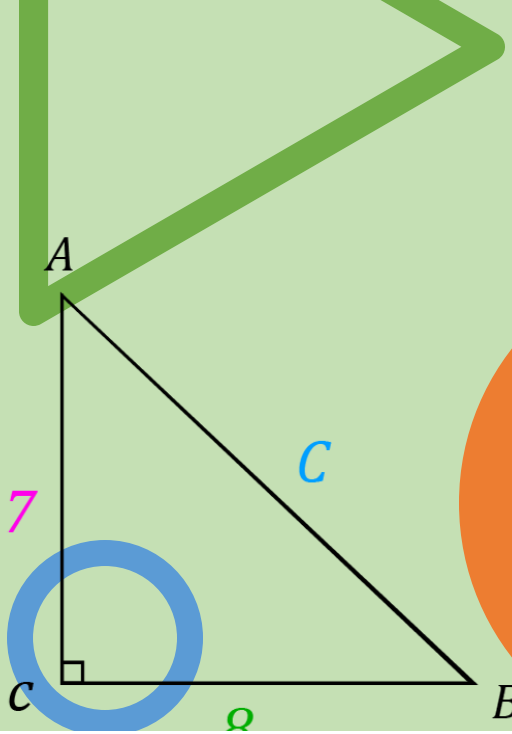
Examples of the theorem

$A^2 + B^2 = C^2$



$A^2 + B^2 = C^2$





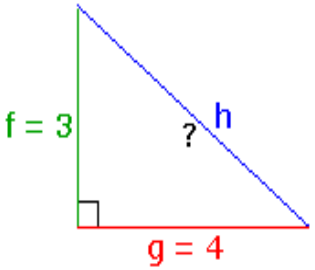
$a^2+b^2=c^2$

$8^2+7^2=c^2$

$64+49=c^2$

$113=c^2$

$c=\sqrt{113}$



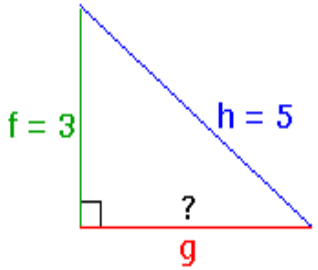
$h^2 = f^2 + g^2$

$h^2 = (3)^2 + (4)^2$

$h^2 = 9 + 16$

$h^2 = 25$

$h = 5$



$h^2 = f^2 + g^2$

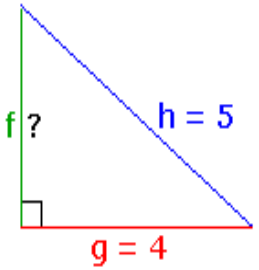
$g^2 = h^2 - f^2$

$g^2 = (5)^2 - (3)^2$

$g^2 = 25 - 9$

$g^2 = 16$

$g = 4$



$h^2 = f^2 + g^2$

$f^2 = h^2 - g^2$

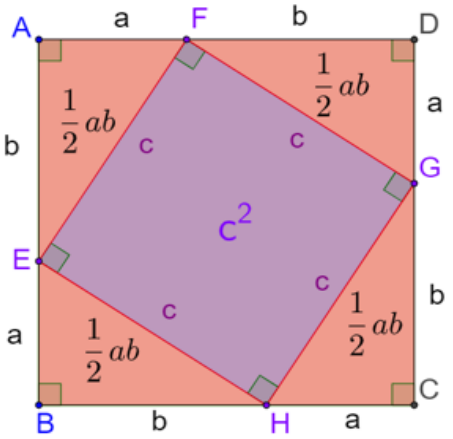
$f^2 = (5)^2 - (4)^2$

$f^2 = 25 - 16$

$f^2 = 9$

$f = 3$

Proof of Pythagorean Theorem



Area of square ABCD = $(a+b)^2$

Area of 4 triangles = $4\left(\frac{1}{2}ab\right) = 2ab$

Area of square EFGH = c^2

Area of ABCD = Area of EFGH + Area of triangles

$$(a+b)^2 = c^2 + 2ab$$

$$(a+b)(a+b) = c^2 + 2ab$$

$$a^2 + 2ab + b^2 = c^2 + 2ab$$

$$a^2 + b^2 = c^2$$