

Pythagorean Theorem



Definition:

Pythagorean Theorem states that: "The area of the square built upon the hypotenuse of a right triangle is equal to the sum of the areas of the squares upon the remaining sides."

History:

Who: Pythagoras (569-500 B.C.E.)

Where: Born in the island of Samos in Greece

What: Pythagoras of Samos was a famous Greek mathematician and philosopher. He is known best for the proof of the important Pythagorean theorem. He made a great impact on mathematics, theory of music and astronomy.

His beliefs (Source: <https://kids.kiddle.co/Pythagoras>)

Pythagoras' most important belief was that the physical world was mathematical and that numbers were the real reality.

1. that at its deepest level, reality is mathematical in nature,
2. that philosophy can be used for spiritual purification,
3. that the soul can rise to union with the divine,
4. that certain symbols have a mystical significance, and
5. that all brothers of the order should observe strict loyalty and secrecy.

Pythagorean Theorem:

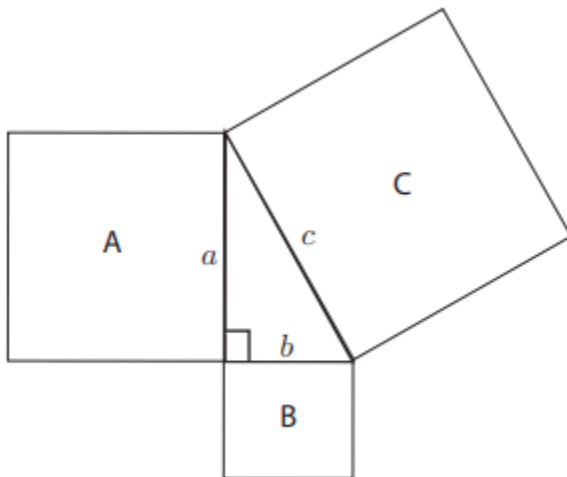
The theorem refers to a right-angled triangle. The side opposite the right-angle is the longest side and is called the hypotenuse.



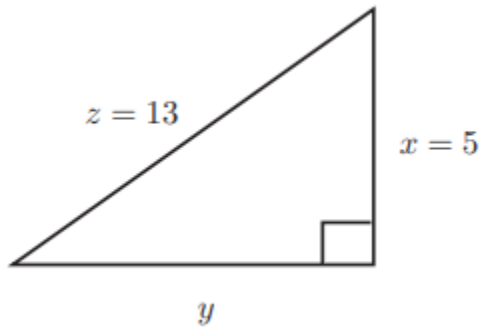
What the theorem says: the area of the square on the hypotenuse is equal to the sum of the areas of the squares on the two shorter sides.

The figure below shows the squares drawn on the hypotenuse and on the two shorter sides.

Area A + Area B = Area C - this can also be written as $a^2 + b^2 = c^2$



Example:



$$x^2 + y^2 = z^2$$

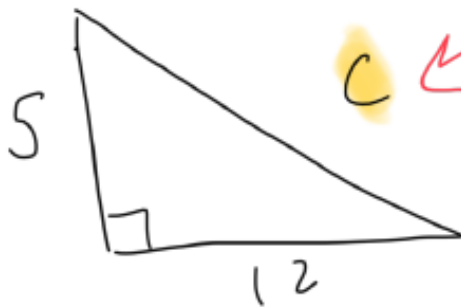
$$5^2 + y^2 = 13^2$$

$$25 + y^2 = 169$$

$$y^2 = 144$$

$$y = \sqrt{144} = 12$$

Try this:



Answer

$$a^2 + b^2 = c^2$$
$$5^2 + 12^2 = c^2$$
$$25 + 144 = c^2$$
$$25 + 144 = 169 \rightarrow 169 = c^2$$
$$c^2 = 169$$
$$c = \sqrt{169}$$
$$c = 13$$