

CONCORD SPARK TUTORING

PYTHAGOREAN THEOREM



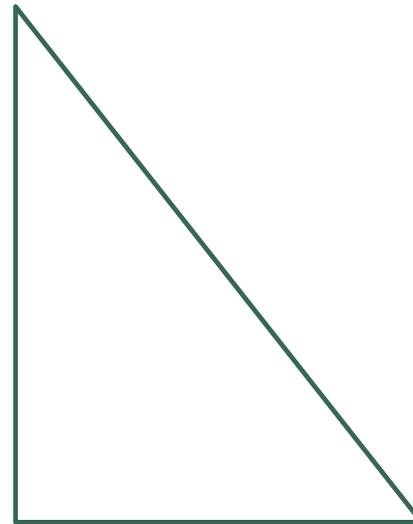
The Pythagorean Theorem is easy to remember. If a right triangle has sides x , y and h where h is the hypotenuse, then: $x^2 + y^2 = h^2$.

HISTORY

- Pythagoras of Samos
 - Ancient Greek Philosopher (c. 570 – c. 495 B.C.)
 - Believed in *metempsychosis*, the belief that souls are immortal and move onto new human bodies after death
 - Credited with various mathematical and scientific discoveries, some of which include:
 - - Pythagorean Theorem
 - - The Five Regular Solids
 - - Theory of Proportions
 - - Sphericity of the Earth

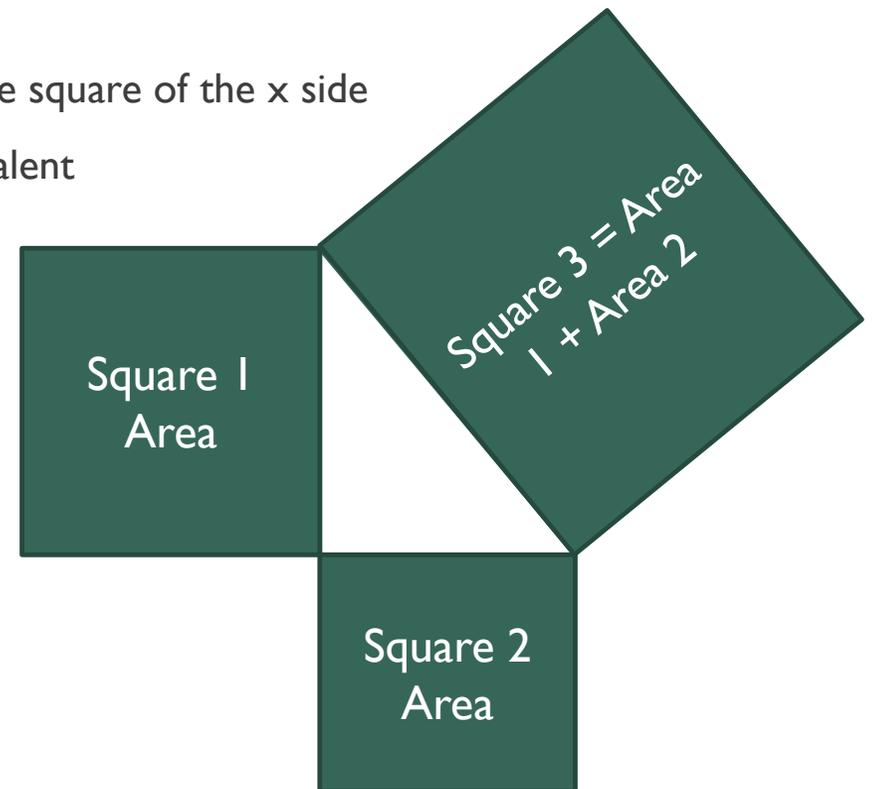
A RIGHT TRIANGLE

- A triangle contains three angles. A right triangle is one that specifically contains a ninety degree angle as one of its three angles.
- This forms two sides which are perpendicular to each other.
- The one side that is 'slanted' is termed the hypotenuse.
- In this presentation, the other two sides will be referred to as the 'y' side and 'x' side.



DEFINITION

- The Pythagorean Theorem states that:
 - In a right triangle, the area of the square whose side is the hypotenuse equals the sum of the squares on the other two sides of the triangle.
 - In other words, the square of the hypotenuse = the square of the y side + the square of the x side
 - The figure shown demonstrates this theory. The square with Area 3 is equivalent to the sums of the area of squares 1 and 2.
 - In algebraic terms, we can state the theory as either:
 - $x^2 + y^2 = h^2$
 - Or, if we take the square root of both sides, we get:
 - $\sqrt{x^2 + y^2} = h$



USES

- When do we use the Pythagorean Theorem?
- Anytime we need to find the length of any of a right triangle's sides.
- This most often comes into play when dealing with trigonometric problems.
 - For example, if you are given the length of the hypotenuse and then are asked to find the exact ratio value for the sine of the triangle, you would:
 - Use the Pythagorean Theorem to determine the length of the 'y' side
 - State the trigonometric ratio of the sine of the angle as: $\frac{y}{h}$

THE END

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