



Pythagorean Theorem

Math

Name _____ Class _____ Date _____

The Pythagorean Theorem describes the relationship between the lengths of the legs and the hypotenuse of a right triangle.

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

Leg of Right Triangle



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Leg of Right Triangle



Pythagorean Theorem

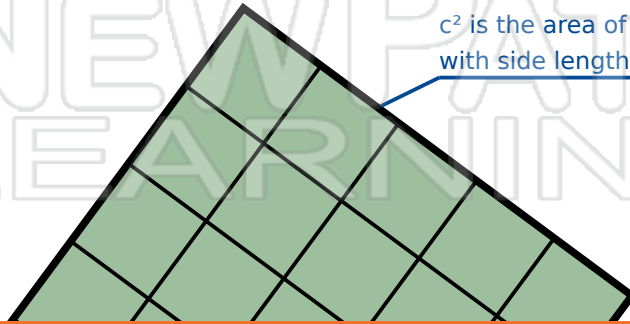
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The relationship $a^2 + b^2 = c^2$ can be shown visually



a^2 is the area of a square with side length a



c^2 is the area of a square with side length c



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The areas of a^2 and b^2 fit into c^2

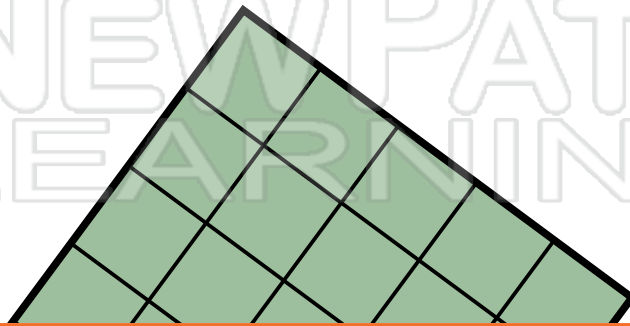


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Given the length of legs **a** and **b**, the length of the hypotenuse can be found using the formula $a^2 + b^2 = c^2$



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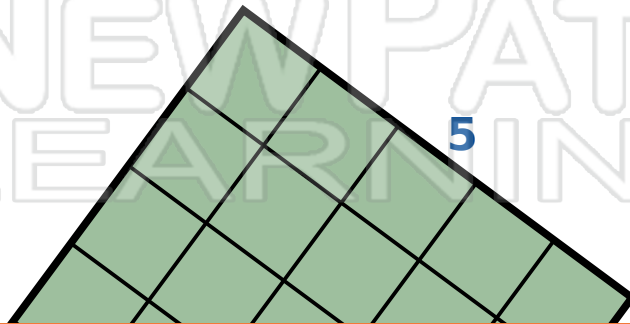


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Given the length of one leg and the length of the hypotenuse, the length of the other leg can be found using the formula $a^2 = c^2 - b^2$



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The Pythagorean Theorem will work for any right triangle.



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$$c = \sqrt{74}$$

$$c = 8.6023$$





Pythagorean Theorem

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The Distance Formula is a variant of the Pythagorean Theorem.

You may calculate the distance between two points using the the Distance Formula

The Distance Formula:

Given the two points $P_1(X_1, Y_1)$ and $P_2(X_2, Y_2)$, the distance between these points is given by the formula:

$$\text{distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

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$d \approx 7.2111$