



# PYTHAGOREAN THEOREM

## INTRODUCTION

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# TOPIC OUTLINE

## Pythagorean Theorem



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## Statement I

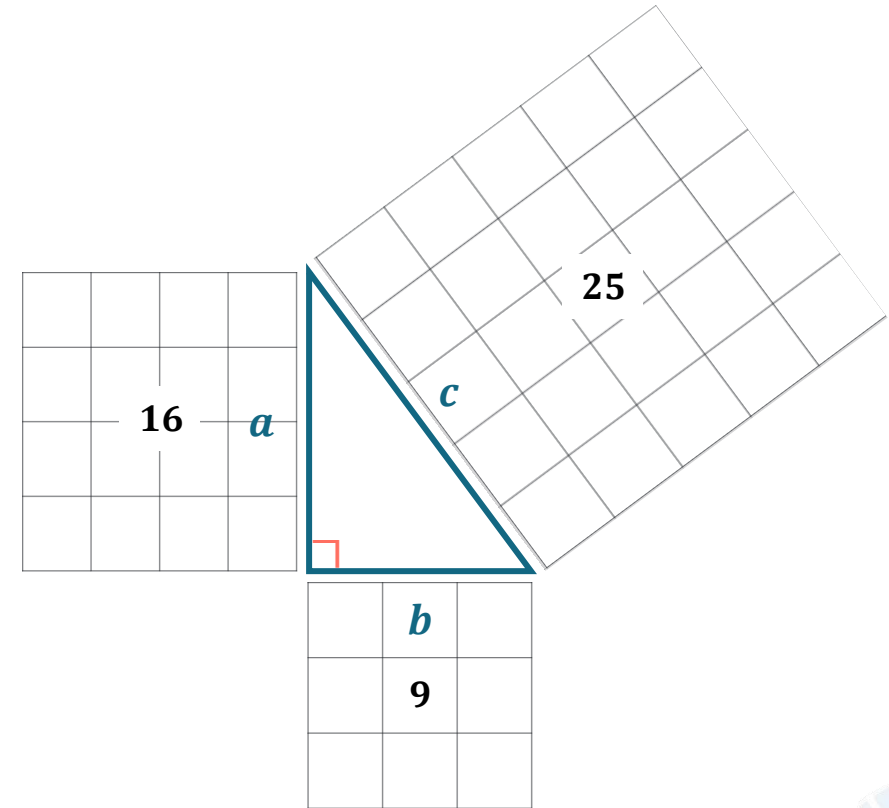
If  $a$  and  $b$  are the lengths of the legs of a right triangle, and  $c$  is the length of its hypotenuse, then

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

## Statement II

If the positive numbers  $a$ ,  $b$ , and  $c$  satisfy  $a^2 + b^2 = c^2$ , then a triangle with these side lengths has a **right angle** opposite the side with length  $c$ .

## Right Triangle

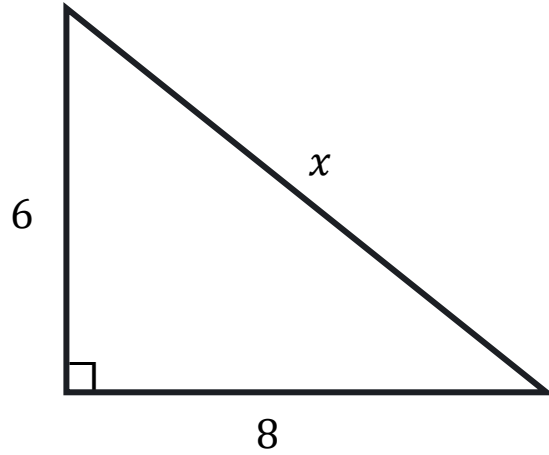


## EXERCISE

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Find the value of  $x$  in the given right triangle.

Solution

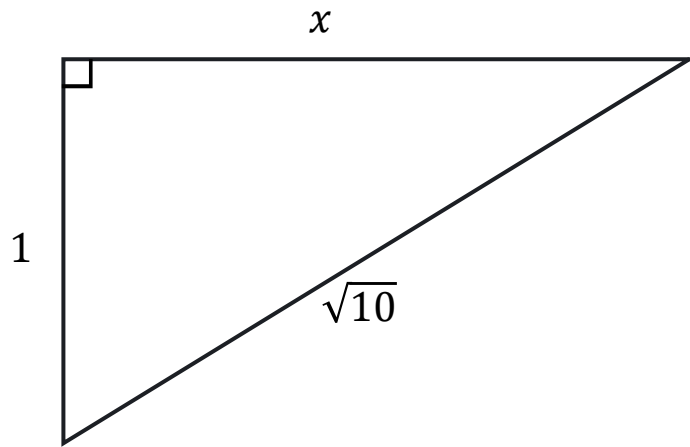


## EXERCISE

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Compute the length of the missing side of the given right triangle.

Solution



## EXERCISE

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Show that a triangle with sides 3, 4, and 5 is a right triangle.

Solution



## EXERCISE

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In a right triangle, one leg measures 1 unit, and the hypotenuse measures 3 units. Determine the length of the other leg.

Solution





## EXERCISE

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In an isosceles right triangle, the hypotenuse has a length of 1 unit. Determine the length of one of the legs of the triangle.

Solution



## EXERCISE

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A rectangular lot measures 12 meters in length and 9 meters in width. Tom walks diagonally across the lot from point A (one corner) to point B (the opposite corner), while Mark walks along the perimeter, following the two sides of the rectangle from point A to point B. How much farther does Mark walk than Tom?

Solution



# SEATWORK

