Name \_\_\_\_\_

## Date \_\_\_\_\_

Proof of the Pythagorean Theorem and its Converse - Guided Lesson Explanation

## Explanation#1

Plug in 5, 5, and 9 into the Pythagorean theorem. Use the smaller numbers for a and b and the largest number for c. If it results in a true equation, it is a right triangle.

$$a^{2} + b^{2} = c^{2}$$
  
 $5^{2} + 5^{2} = 9^{2}$   
 $25 + 25 = 81$   
 $50 = 81$ 

This is false, it's not a right triangle.

## Explanation#2

In a right triangle,  $a^2 + b^2 = c^2$ , where a and b are the lengths of the legs and c is the length of the hypotenuse. This is called the Pythagorean theorem.



Use the Pythagorean theorem, with a = 8 and b = 10.

Pythagorean theorem plug in a 8 and b 10

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

$$8^{2} + 10^{2} = c^{2}$$

$$64 + 100 = c^{2}$$

$$164 = c^{2}$$

$$164 = c$$

$$12.80 = c$$
He is 12.80 blocks from home.

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## Explanation#3

We use the same setup as #1. Plug in 9, 12, and 15.

Use the smaller numbers (9, 12) for a and b and the largest number (15) for c.

 $a^{2} + b^{2} = c^{2}$   $9^{2} + 12^{2} = 15^{2}$  81 + 144 = 225225 = 225

This is true; it's a right triangle.

