Pythagorean Theorem in Action Guided Lesson Explanation

1. If this is a right triangle it will work out when the Pythagorean Theorem is applied to it. This means it will flow in the formula:

$leg^2 + leg^2 = hypotenuse^2$

$16^2 + 14^2 = 22^2$

Now we just need to see if the math works out.

$16^2 + 14^2 = 22^2$
$256 + 196 = 484$
$452 = 484$ (This is not true.)

Since our values are not true, **it is not a right triangle.**

2. We are told it is a right triangle. This means that the Pythagorean Theorem can be used to find all the side.

$leg^2 + leg^2 = hypotenuse^2$ **We can use simple algebra to arrange this.**

$hypotenuse^2 - leg^2 = missing\ leg^2$ **We just drop our values in now.**

$27^2 - 17^2 = missing\ leg^2$

$729 - 289 = missing\ leg^2$

$440 = missing\ leg^2$ If we take the square root of both sides, we will solve it.

$\sqrt{440} = \sqrt{missing\ leg^2}$

$20.98 = missing\ leg$

3. We can see from the right triangle that we are provided that 75 is the measure of the hypotenuse and 42 is the measure of a leg. To find the missing leg, we can apply the same formula, we previously used, since it is a right triangle.

$leg^2 + leg^2 = hypotenuse^2$ As we did previously, we can rearrange it for our needs.

$hypotenuse^2 - leg^2 = missing\ leg^2$ We can now put our data into it.

$75^2 - 42^2 = missing\ leg^2$

$5{,}625 - 1{,}764 = missing\ leg^2$

$3{,}861 = missing\ leg^2$

$\sqrt{3{,}861} = \sqrt{missing\ leg^2}$

$62.14 = missing\ leg$