Bell Ringer - Solve the quadratic.

$$2x^2 - 6x = 36$$

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$$2x^2 - 6x = 36$$

$$2x^2 - 6x - 36 = 0$$

$$2(x^2 - 3x - 18) = 0$$

$$2(x - 6)(x + 3) = 0$$

$$x = 6 \text{ and } -3$$

Chapter 12-5 Pythagorean Theorem Notes

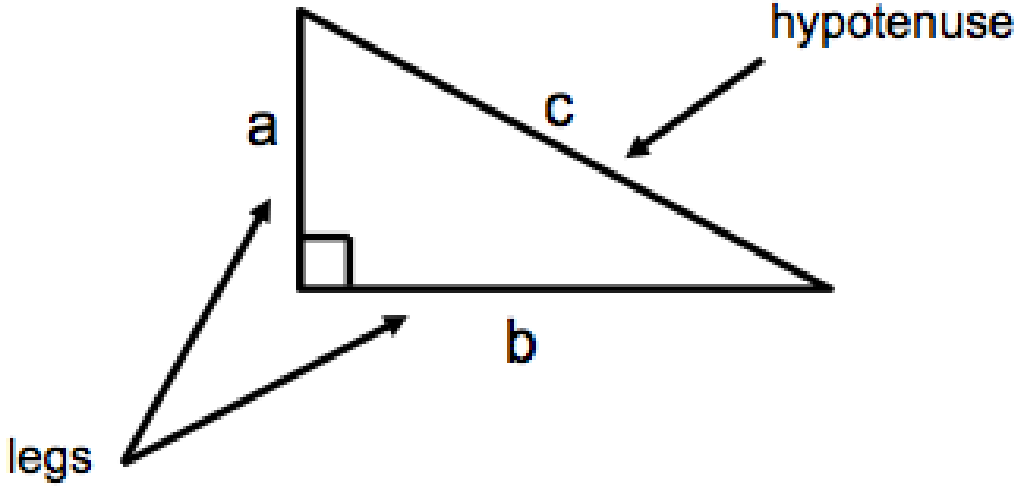
Pythagorean Theorem

- if given a right triangle exists, then $a^2 + b^2 = c^2$

Pythagorean Theorem Converse

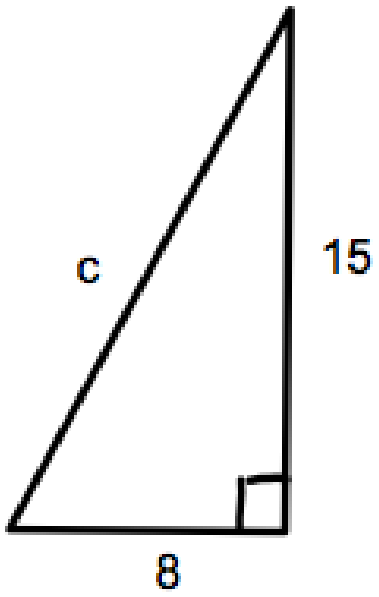
- if given $a^2 + b^2 = c^2$, then a right triangle exists.

Applies **only** to right triangles.



Find the unknown measurement.

1)



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

$$8^2 + 15^2 = c^2$$

$$64 + 225 = c^2$$

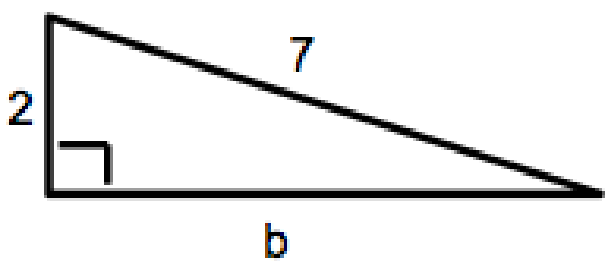
$$289 = c^2$$

$$\sqrt{289} = \sqrt{c^2}$$

$$17 = c$$

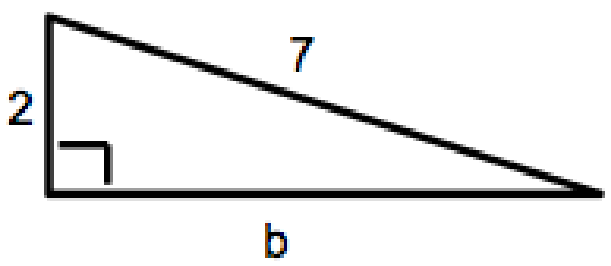
Find the unknown measurement. Leave in simplified radical form.

2)



Find the unknown measurement. Leave in simplified radical form.

2)



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

$$2^2 + b^2 = 7^2$$

$$4 + b^2 = 49$$

$$b^2 = 45$$

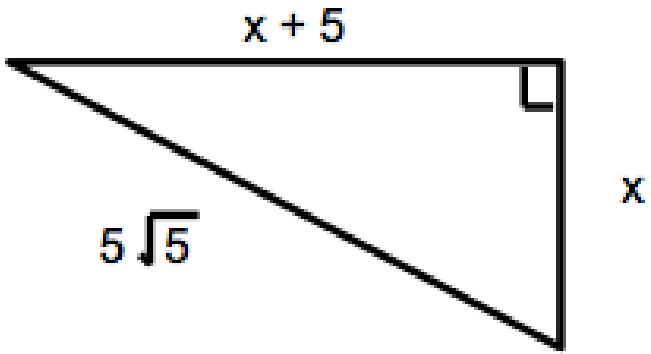
$$b = \sqrt{45}$$

$$b = \sqrt{9} \cdot \sqrt{5}$$

$$b = 3\sqrt{5}$$

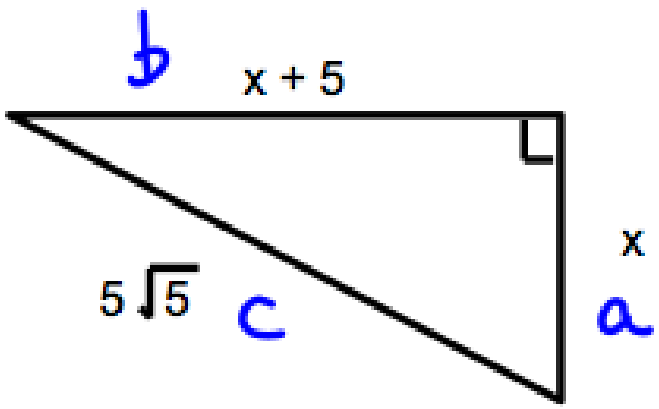
Find the measurement of each side.

3)



Find the measurement of each side.

3)



$$x^2 + (x+5)^2 = (5\sqrt{5})^2$$

$$x^2 + x^2 + 10x + 25 = 125$$

$$2x^2 + 10x - 100 = 0$$

$$2(x + 5x - 50) = 0$$

$$2(x+10)(x-5) = 0$$

$$x = -10 \text{ and } 5$$

Only 5 works as a solution.

Side measurements

$a = x = 5$

$b = x + 5 = 10$

$c = 5\sqrt{5}$

4) Are 8, 10, and 13 possible side lengths of a right triangle?

4) Are 8, 10, and 13 possible side lengths of a right triangle?

Need to use the converse.

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

$$8^2 + 10^2 \stackrel{?}{=} 13^2$$

$$64 + 100 \stackrel{?}{=} 169$$

$$164 \neq 169$$

Not possible to make a right triangle with these side lengths.