Bell Ringer - Solve the equation.

$$\frac{1}{2}x = \sqrt{2x-3}$$

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$$\left(\frac{1}{2}x\right)^2 = \left(\sqrt{2x-3}\right)^2$$

$$\left(\frac{1}{4}x^2 = 2x - 3\right) \cdot 4$$

$$x^2 = 8x - 12$$

$$x^2 - 8x + 12 = 0$$

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

$$x = 6 \text{ and } 2$$

Chapter 12-5 Pythagorean Theorem Notes - Day 2

Quick Review

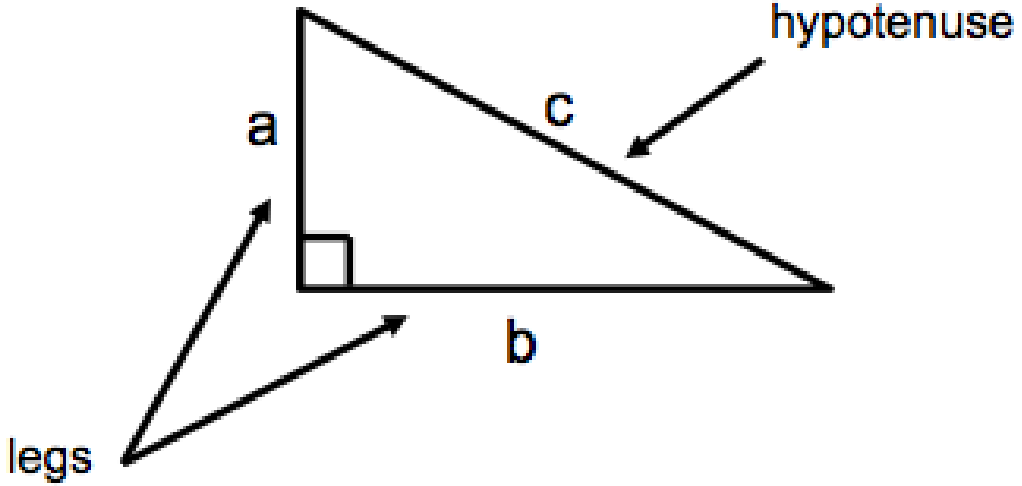
Pythagorean Theorem

- 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.



1) What is $(2\sqrt{7})^2$?

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$2 \cdot \sqrt{7} \cdot 2 \cdot \sqrt{7}$

$4 \cdot 7$

28

2) A bird flies 9 miles south and then 40 miles west. How many miles away is the bird from where it started?

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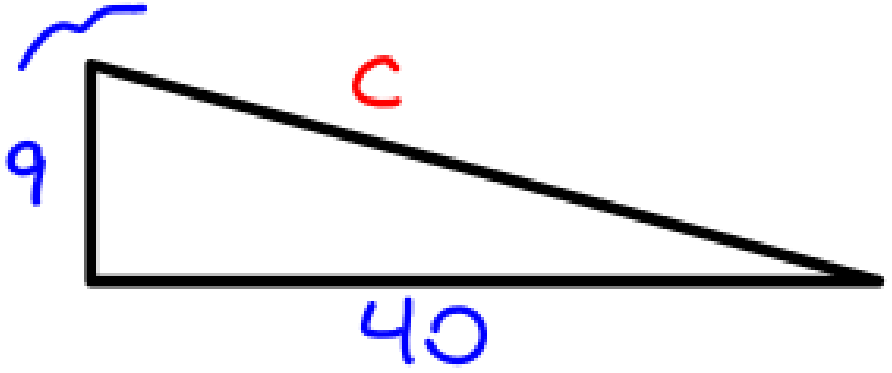

41 miles

$$9^2 + 40^2 = c^2$$

$$81 + 1600 = c^2$$

$$\sqrt{1681} = \sqrt{c^2}$$

$$41 = c$$

3) Are 6/7, 4/3, and 5/3 possible side lengths of a right triangle?

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Hint: clear the fractions by multiplying by a common denominator.

$$\frac{6}{7}\cdot\frac{21}{1} + \frac{4}{3}\cdot\frac{21}{1} = \frac{5}{3}\cdot\frac{21}{1}$$

$$18 + 28 = 35$$

$$a^2 + b^2 \stackrel{?}{=} c^2$$

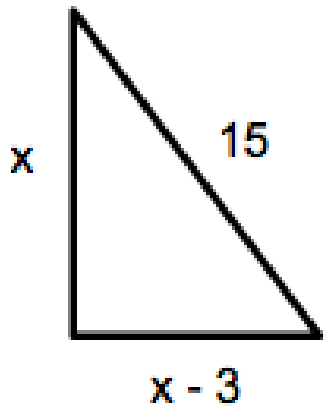
$$18^2 + 28^2 \stackrel{?}{=} 35^2$$

$$324 + 784 \stackrel{?}{=} 1225$$

$$1108 \neq 1225$$

Not possible

4) Solve for x; then find the side lengths.



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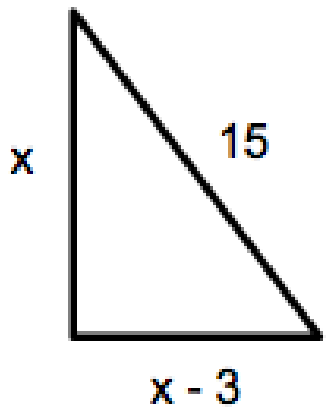

$$x^2 + (x-3)^2 = 15^2$$

$$x^2 + x^2 - 6x + 9 = 225$$

$$2x^2 - 6x - 216 = 0$$

$$2(x^2 - 3x - 108) = 0$$

$$2(x-12)(x+9) = 0$$

$x = 12$ and -9

only 12 is a solution

side lengths

$x = 12$

$x - 3 = 9$