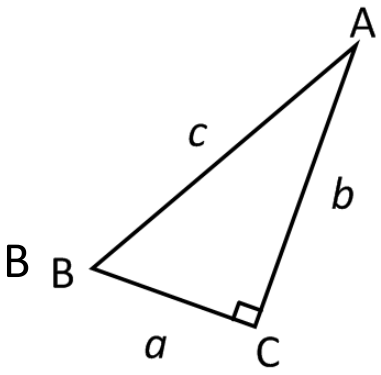
8.2 The Pythagorean Theorem



(Conventionally, we call the side across from a labeled angle by the same letter name as the angle, but with a lowercase letter.)

For any **right triangle**, the lengths of the sides are related by the equation

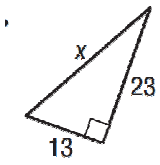
$$a^2 + b^2 = c^2,$$

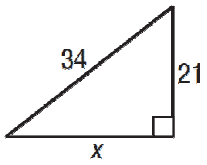
where *a* and *b* are the measures of the **legs** and *c* is the measure of the hypotenuse.

How do we use the Pythagorean Theorem?

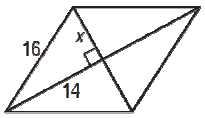
1. Find the missing 3rd side of a right triangle.
2. Determine whether a right triangle is formed by 3 specified measures.
3. Locate a **Pythagorean triple**

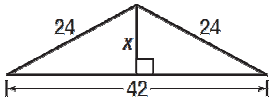
1. Find the missing side of each right triangle using the Pythagorean Theorem.





Find *x*, using the Pythagorean Theorem.





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2. Determine whether each set of measures can be the measures of the sides of a right triangle. Key = make sure you **always** use the longest side as your *c* value!

9, 40, 41

24, 32, 40

$\frac{\sqrt{4}}{7}, \frac{2\sqrt{3}}{7}, \frac{4}{7}$

$\frac{9}{5}, \frac{12}{5}, 3$

A **Pythagorean Triple** is a set of 3 **integer** side measures that forms a right triangle.

3. State whether any of the right triangles found in the previous set is a Pythagorean Triple.