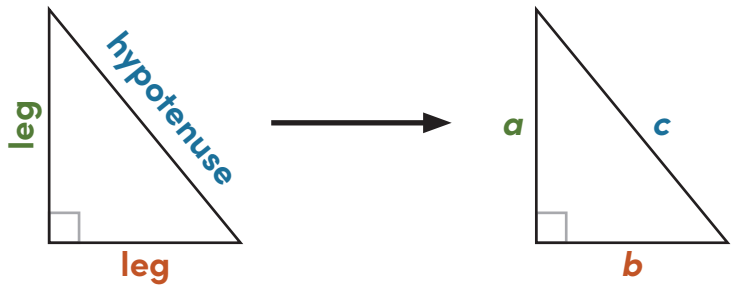
Pythagorean Theorem

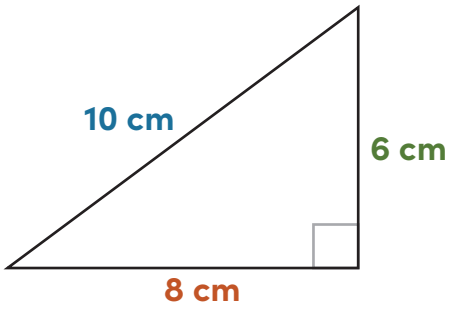
The **Pythagorean theorem** states that in a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs.



Equation:

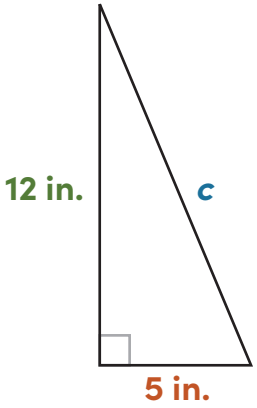
$$a^2 + b^2 = c^2$$

The Pythagorean theorem holds true for **all** right triangles.



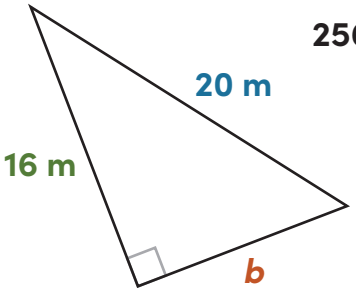
$$a^2 + b^2 = c^2$$
$$6^2 + 8^2 = 10^2$$
$$36 + 64 = 100$$
$$100 = 100 \checkmark$$

You can use the Pythagorean theorem to find a missing hypotenuse of a right triangle:



$$12^2 + 5^2 = c^2$$
$$144 + 25 = c^2$$
$$169 = c^2$$
$$\sqrt{169} = c$$
$$13 = c$$
$$c = 13 \text{ in.}$$

You can use the Pythagorean theorem to find a missing leg of a right triangle:



$$16^2 + b^2 = 20^2$$
$$256 + b^2 = 400$$
$$b^2 = 400 - 256$$
$$b^2 = 144$$
$$b = \sqrt{144}$$
$$b = 12 \text{ m}$$