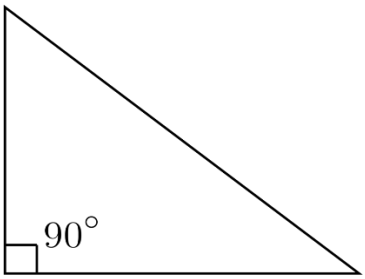
Right Triangles

*A right triangle consists of one side that has an angle measurement of 90˚.



*The long side opposite the 90˚ is the hypotenuse. The lengths of all sides can be related through the Pythagorean theorem which states that the sum of the squares of the two non-hypotenuse sides will equal the square of the hypotenuse.

$$A^2 + B^2 = C^2$$

Or, as it relates to the right triangle: $(\text{Side 1})^2 + (\text{Side 2})^2 = \text{Hypotenuse}^2$

So, if you know the lengths of two sides of a right triangle, you can solve for the length of the third side.

Example 1: If the shorter (non-hypotenuse sides) of a right triangle are 4 cm and 3 cm, what is the length of the hypotenuse?

$(4)^2 + (3)^2 = C^2$

$16 + 9 = C^2$

$25 = C^2$

$\sqrt{25} = C$

$5 = C$ The length of the hypotenuse is 5 cm.

Example 2: If the hypotenuse of a right triangle has a length of 16 inches and one of the other sides has a length of 8 inches, what is the length of the third side?

$(8)^2 + B^2 = 16^2$

$64 + B^2 = 256$

$B^2 = 192$

$B = \sqrt{192}$

$B = \sqrt{64}\sqrt{3} = 8\sqrt{3}$ The length of the missing side is $8\sqrt{3}$ inches.