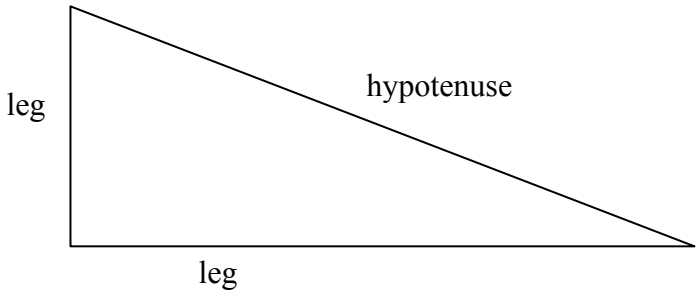
Pythagorean Theorem Notes Name_____

Pythagorean Theorem: $leg^2 + leg^2 = hypotenuse^2$

Uses: Only used with *right triangles*!

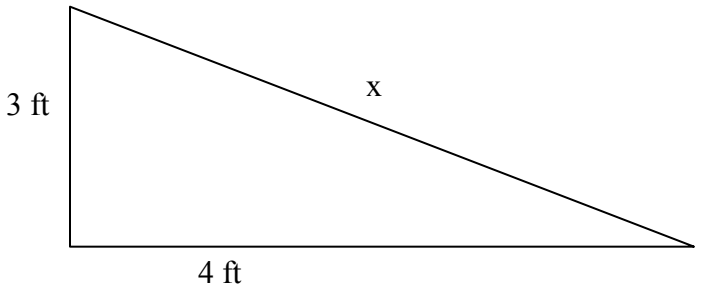
- To figure out **if a triangle is a right triangle**.
- To **find the length of one side** of a *right* triangle if the other two side lengths are known.

It is important to know what the sides of a right triangle are called. The two sides that form the right angle are called legs. The longest side, across from the right angle, is called the hypotenuse.



Once you know this, you simply plug numbers into the formula and solve the equation.

Example 1--hypotenuse length unknown



$leg^2 + leg^2 = hypotenuse^2$

$3^2 + 4^2 = x^2$ (plug numbers into formula)

$9 + 16 = x^2$ (simplify)

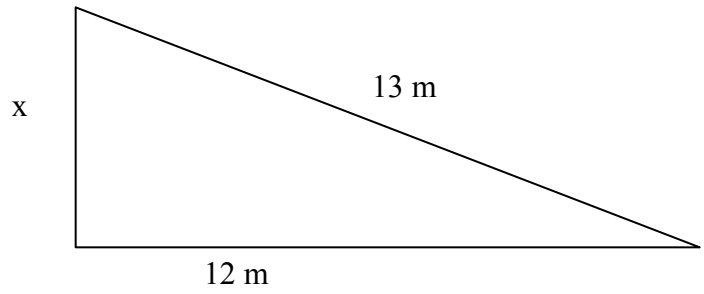
$25 = x^2$ (add)

$\sqrt{25} = \sqrt{x^2}$ (take the square root of both sides)

$5 = x$

$x = 5\,ft$

Example 2--leg length unknown



$leg^2 + leg^2 = hypotenuse^2$

$x^2 + 12^2 = 13^2$ (plug numbers into formula)

$x^2 + 144 = 169$ (simplify)

$-144 \quad -144$ (subtract 144 from both sides)

$x^2 = 25$

$\sqrt{x^2} = \sqrt{25}$ (take the square root of both sides)

$x = 5$ meters