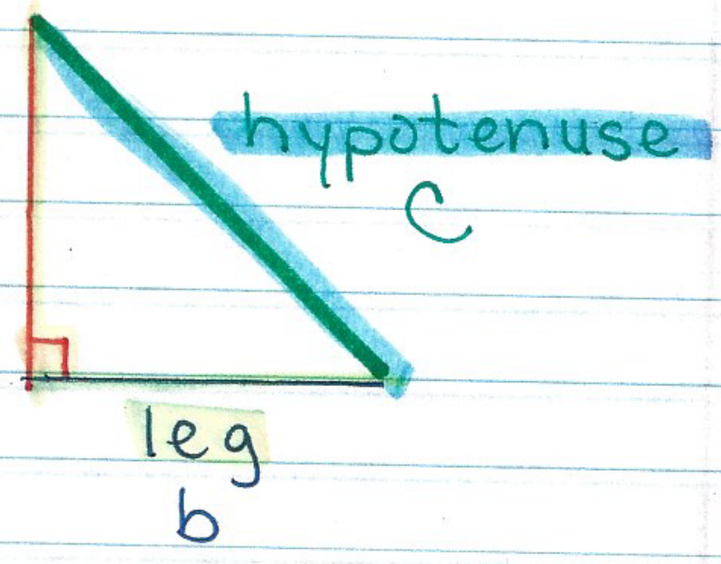
7.3 The Pythagorean Theorem p. 302

The sides of a right triangle have special names.

The legs form the right angle



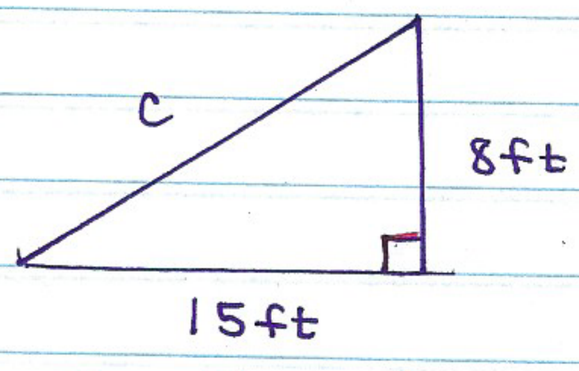
The hypotenuse is across from the right angle and is always the longest side of a right triangle.

The pythagorean Theorem (a math rule) states that, in any right triangle, the sum of the squares of the lengths of the legs is equal to the square of the length of the hypotenuse (as we proved yesterday)

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

Find the length of the hypotenuse:

1)



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

$8^2 + 15^2 = c^2$

$64 + 225 = c^2$

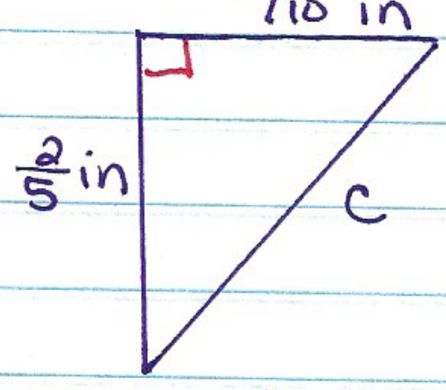
$289 = c^2$

$\sqrt{289} = c^2$

$17 = c$

17 ft

2)



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

$\left(\frac{2}{5}\right)^2 + \left(\frac{3}{10}\right)^2 = c^2$

$\frac{4}{25} + \frac{9}{100} = c^2$

$\frac{16}{100} + \frac{9}{100} = c^2$

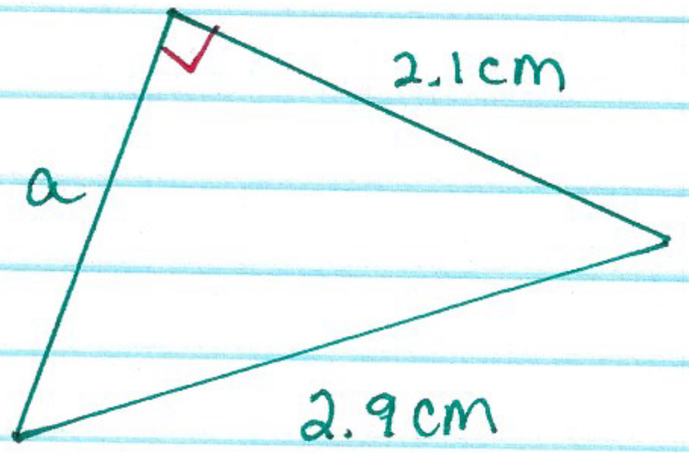
$\frac{25}{100} = c^2$

$\sqrt{\frac{25}{100}} = c \quad \frac{5}{10} = c \quad = \frac{1}{2}$

$\frac{1}{2}$ in

Find the missing length of the triangle.

3)



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

$a^2 + (2.1)^2 = 2.9^2$

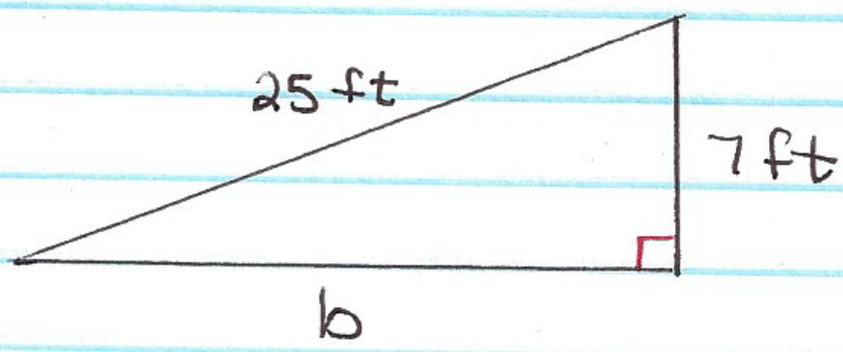
$a^2 + 4.41 = 8.41$

$-4.41 \quad -4.41$

$a^2 = 4$

$a = 2\text{cm}$

4)



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

$7^2 + b^2 = 25^2$

$49 + b^2 = 625$

$-49 \quad -49$

$b^2 = 576$

$b = \sqrt{576}$

$b = 24\text{ ft}$

5) $c = 34\text{ yd}$

$a = 16\text{ yd}$

$b = ?$

$b = 30\text{ yd}$

6) $b = 9.6\text{ m}$

$c = 10.4\text{ m}$

$a = ?$

$a = 4\text{m}$