

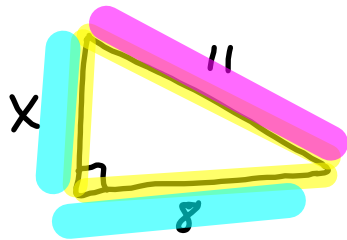
Geometry:

Right Triangle Trigonometry - Day 1

- Pythagorean Theorem.
- Trig Functions

## Pythagorean Theorem

Given a right triangle, it is used to find missing sides. Use 2 sides to find the 3rd side.



Ex: Find  $x$ .

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

where  $a$  &  $b$  are the legs.

&  $c$  is the Hypotenuse.

$$x^2 + 8^2 = 11^2$$

$$x^2 + 64 = 121$$

$-64$        $-64$

$$\sqrt{x^2} = \sqrt{57}$$

$$x = \sqrt{57} \approx 7.54$$

↑  
Actual  
Answer

↑ Just a Line  
Approximation.

Key info!

Roots undo

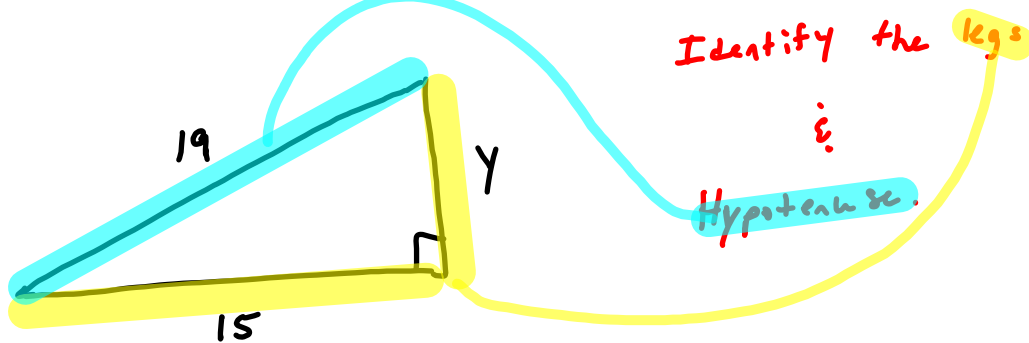
Powers

Square roots

undo squares.

# Right Triangle Trigonometry Day 1

Ex: solve for  $y$ .



Pythagorean Theorem:  $\text{leg}^2 + \text{leg}^2 = \text{Hypotenuse}^2$

$$y^2 + 15^2 = 19^2$$

$$y^2 + 225 = 361$$

-225      -225

$$\sqrt{y^2} = \sqrt{136}$$

Remember  $\sqrt{\square}$  Square roots undo squares.

$$y = \sqrt{136} \approx 11.6$$

Answer

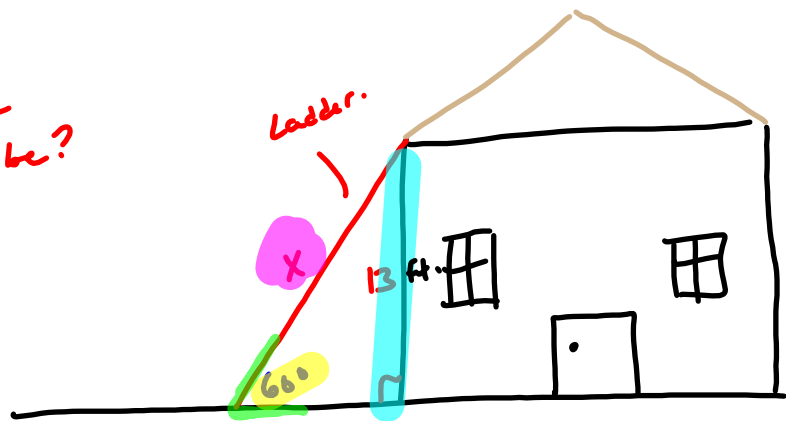
# Right Triangle Trigonometry Day 1

• Trig functions.



Use trig functions to find sides of a right triangle when you don't know 2 side lengths.

How long does the ladder need to be?  
(solve for x)



Sine of an angle is the ratio of its opposite side over the hypotenuse.

$$x \cdot \sin 60^\circ = \frac{13}{x} \cdot x$$

now solve for x.

$$\frac{x \cdot \sin 60^\circ}{\sin 60^\circ} = \frac{13}{\sin 60^\circ}$$

$$x = \frac{13}{\sin 60^\circ} \approx 15 \text{ ft.}$$

Homework:

Algebra 3 5.2 Homework Problems 1-8 Find the missing side length. (Printout)