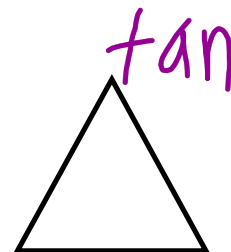
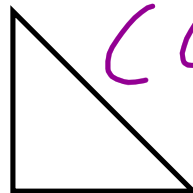


Trigonometry: comes from two Greek terms, trigon, meaning angle, and metron, meaning measure.

Each angle in a triangle has 3 different relationships with the sides of the triangle. In math we call these relationships sine, cosine, and tangent. These relationships between sides are actually ratios, or fractions.

sin



## Trigonometric Ratios

Trigonometric Ratios: is a ratio of the length of two sides of a right triangle.

The three most common trig ratios are **SINE**, **COSINE**, and **TANGENT**. We remember these ratios by the following acronym.

SOH

CAH .

TOA

i  
no  
sa  
n

$$\underline{\sin}(\theta) = \frac{\underline{\text{opp.}}}{\underline{\text{hyp.}}}$$

$$\underline{\cos}(\theta) = \frac{\underline{\text{adj}}}{\underline{\text{hyp.}}}$$

$$\underline{\tan}(\theta) = \frac{\underline{\text{opp.}}}{\underline{\text{adj.}}}$$

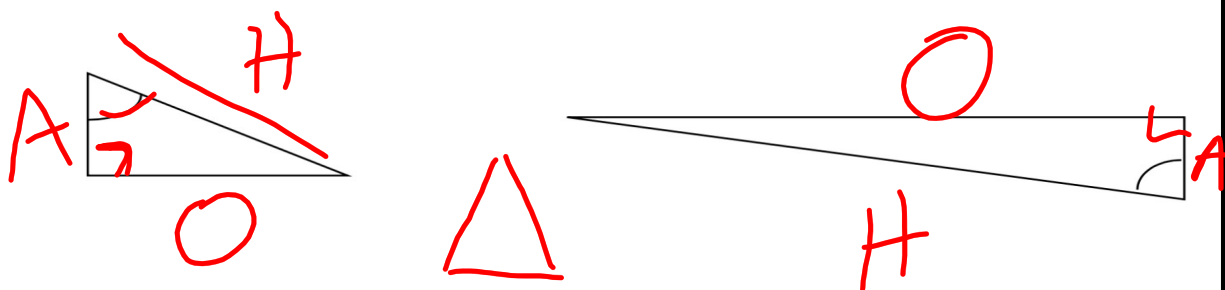
$\theta$  - angle opp - opposite

hyp - hypotenuse adj - adjacent

Vocabulary

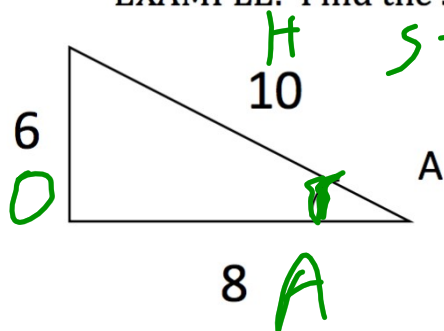
- opposite --- the side leg across from the angle **O**
- adjacent --- the side leg next to the angle **A**
- hypotenuse --- the side across from the right angle **H**

Label the sides of the triangle for the given angle.



# SOH - CAH - TOA

EXAMPLE: Find the sine, cosine, and tangent of angle  $\angle A$ .



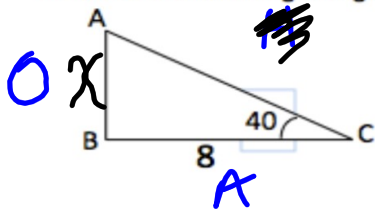
$$\text{Sin } A = \frac{6}{10}$$

$$\text{Cos } A = \frac{8}{10}$$

$$\text{Tan } A = \frac{6}{8}$$

If you know one side and you know one angle, then you can use these with sine, cosine, or tangent to figure out the missing sides.

1. Given the following triangle, find the length of side  $\overline{AB}$ .



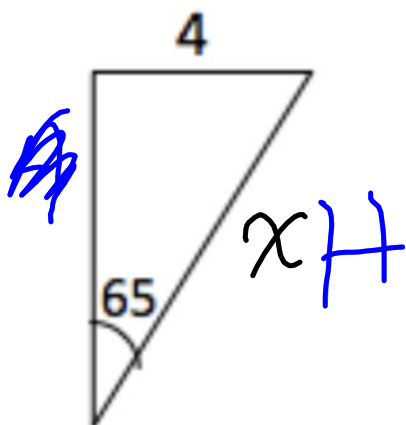
~~SOH-CAH-TOA~~

$$\tan(40) = \frac{x}{8}, x$$

USING NSOLVE: Menu -> Alg(3) -> NSolve()

$$x = 6.71$$

2. Find the hypotenuse.



~~SOH CAH TOA~~

$$\sin(65) = \frac{4}{x}$$

$$x = 4.41$$