

D3 9.4/9.5  
2/25

**Trigonometry**  
**Sine, Cosine and Tangent Ratios**

Feb 18-7:52 AM

Naming the sides of the triangle.

**Opposite Leg**, **Adjacent Leg**, and **Hypotenuse**.  
 "next to" "across R angle"

The name of the legs is dependent on the angle that you are looking at

From A

From B

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A **trigonometric ratio** is a ratio of the lengths of two sides in a right triangle.

A ratio is a fraction.

$$\frac{\text{side length}}{\text{side length}}$$

There are **3** common Trigonometric Ratios:

They will always be related to an angle

1.) Sine

2.) Cosine

3.) Tangent

They have abbreviations ...

sin

cos

tan

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Trigonometric Ratios Defined:

SOH CAH TOA

Sine A =  $\frac{\text{opposite}}{\text{hypotenuse}}$

Cosine A =  $\frac{\text{adjacent}}{\text{hypotenuse}}$

Tangent A =  $\frac{\text{opposite}}{\text{adjacent}}$

Feb 18-8:26 AM

Sine = opposite/hypotenuse

Cosine = adjacent/ hypotenuse

Tangent = opposite/adjacent

Feb 18-7:58 AM

**Example**  
 Find Sin, Cos, and Tan, of  $\angle A$

SOH - CAH - TOA

Sin A =  $\frac{5}{13}$

Cos A =  $\frac{12}{13}$

Tan A =  $\frac{5}{12}$

PUT YOUR BONY FINGER ON angle A  
 LABEL YOUR SIDES

Feb 18-8:28 AM

SOH CAH TOA

Sin C =  $\frac{7}{25}$   
 Cos C =  $\frac{24}{25}$   
 Tan C =  $\frac{7}{24}$

Sin A =  $\frac{24}{25}$   
 Cos A =  $\frac{7}{25}$   
 Tan A =  $\frac{24}{7}$

Feb 28-12:11 PM

TOYO:

Find Sin, Cos, Tan for Angle A and Angle C

SOH CAH TOA

Sin A =  $\frac{11}{12}$   
 Cos A =  $\frac{4}{12}$   
 Tan A =  $\frac{11}{4}$

Sin C =  $\frac{4}{12}$   
 Cos C =  $\frac{11}{12}$   
 Tan C =  $\frac{4}{11}$

Feb 20-10:33 AM

Bonus

Sin A =  $\frac{4}{5}$   
 Cos A =  $\frac{3}{5}$   
 tan A =  $\frac{4}{3}$

(1st) Solve for 3<sup>rd</sup> side  
 $c^2 = 25$      $a^2 + b^2 = c^2$   
 $c = 5$      $3^2 + 4^2 = c^2$   
 $9 + 16 = c^2$

Feb 20-10:35 AM

Grid Work

Feb 20-10:35 AM

Homework: Worksheet D

Feb 20-10:35 AM