Entry #: 4

SINE, COSINE, & TANGENT

TRIGONOMETRY of Right Triangles

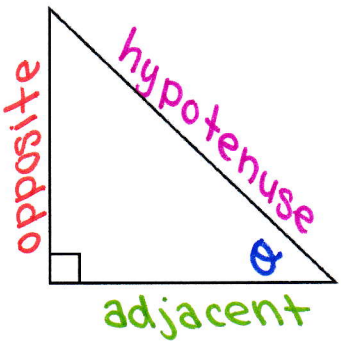
Trigonometric functions can help us find missing side lengths of right triangles.

The three trigonometric functions are sine, cosine, and tangent.

Trigonometric functions can be used if we know one angle measure (besides the right angle) and at least one side length of the right triangle.

The input of a trigonometric function is an angle measure and the output is a ratio of side lengths (of right Δ).

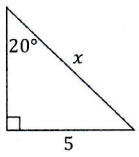
TRIGONOMETRIC RATIOS of Right Triangles



$\sin(\theta) =$	$\frac{\text{opposite}}{\text{hypotenuse}}$
$\cos(\theta) =$	$\frac{\text{adjacent}}{\text{hypotenuse}}$
$\tan(\theta) =$	$\frac{\text{opposite}}{\text{adjacent}}$

SOH - CAH - TOA

Examples: Solve for the variable.

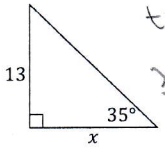
1. 

$\sin(20°) = \frac{5}{x}$

$\frac{x\sin(20°)}{\sin(20°)} = \frac{5}{\sin(20°)}$

$x = \frac{5}{\sin(20°)}$

$x \approx 14.62$

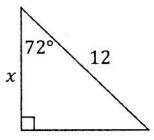
2. 

$\tan(35°) = \frac{13}{x}$

$\frac{x\tan(35°)}{\tan(35°)} = \frac{13}{\tan(35°)}$

$x = \frac{13}{\tan(35°)}$

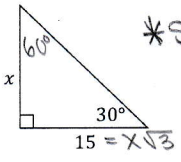
$x \approx 18.57$

3. 

$\cos(72°) = \frac{x}{12}$

$x = 12\cos(72°)$

$x \approx 3.71$

4. 

*Special right Δ!

$x = 5\sqrt{3}$

$x = \frac{15}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$= \frac{15\sqrt{3}}{3}$

$= 5\sqrt{3}$