

**Right Triangle Trig/SOHCAHTOA**-used to find side lengths when we have 1 side length and 1 angle measure

• What you need to know:

$\ominus$  "theta" symbol that is used to represent an angle (degree meas)

• Sin Sine Cos cosine Tan Tangent

• On a right triangle we need to identify 3 sides in relation to the angle "theta"

Hypotenuse (across the  $90^\circ \angle$ )

Opposite side (across the  $\angle$  given/ $\theta$ )

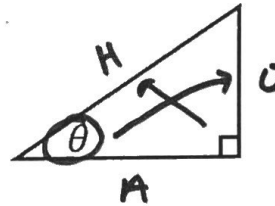
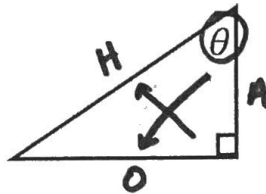
Adjacent side (next to the  $\angle$  given/ $\theta$ )

**SOH CAHTOA**

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$



Identify the Hypotenuse, Opposite side, and Adjacent side in relation to the angle "theta"

Trigonometric ratios as fraction and decimal

Directions: Write each trigonometric ratio as a simplified fraction.

1)  $\sin C$   $\frac{SO}{H}$   $\frac{4}{5} = .8$

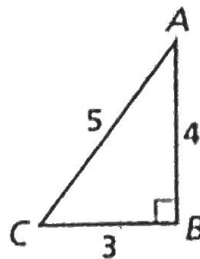
2)  $\tan A$   $\frac{TO}{A}$   $\frac{3}{4} = .75$

3)  $\cos A$   $\frac{CA}{H}$   $\frac{4}{5} = .8$

4)  $\cos C$   $\frac{CA}{H}$   $\frac{3}{5} = .6$

5)  $\tan C$   $\frac{TO}{A}$   $\frac{4}{3} = 1.3\bar{3}$

6)  $\sin A$   $\frac{SO}{H}$   $\frac{3}{5} = .6$



\* make sure calculator is in degrees not radians!

Directions: Use your calculator to find each trigonometric ratio. Round to the nearest hundredth.

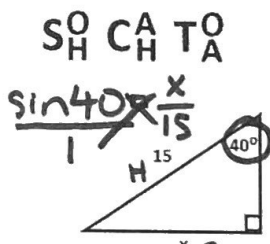
7)  $\tan 67^\circ \approx 2.36$

8)  $\sin 23^\circ \approx .39$

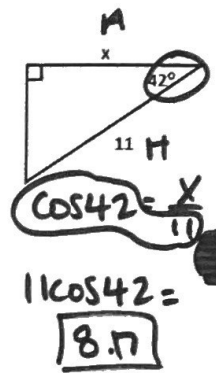
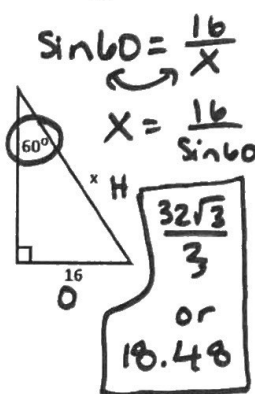
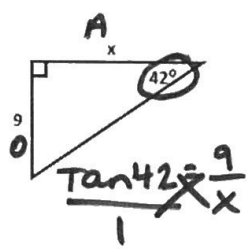
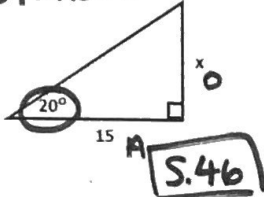
9)  $\cos 49^\circ \approx .66$

Now that we understand the set up, let's practice. Find x.

\*  $\theta$  is never the  $90^\circ$  angle.



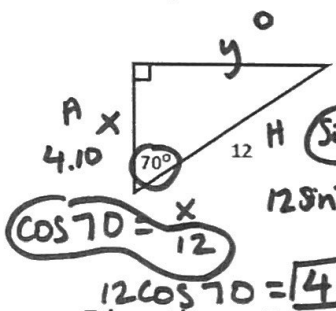
$\tan 20^\circ = \frac{x}{15}$   
 $15 \tan 20^\circ = x$



$x = 15 \sin 40^\circ \approx 9.64$

$x = 15 \tan 20^\circ \approx 5.46$

Find all missing sides:

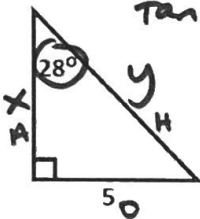


$\sin 70^\circ = \frac{y}{12}$

$12 \sin 70^\circ = 11.28$

$\cos 70^\circ = \frac{x}{12}$

$12 \cos 70^\circ = 4.10$

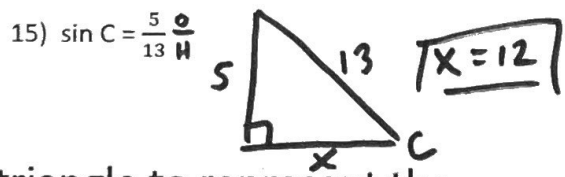
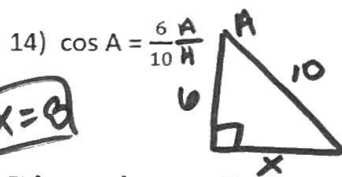


$9 = x \tan 42^\circ$   
 $\frac{9}{\tan 42^\circ} = x$   
 $x = 10$

$\tan 28^\circ = \frac{5}{x}$   
 $\frac{5}{\tan 28^\circ} = 9.40$

$\sin 28^\circ = \frac{5}{y}$   
 $\frac{5}{\sin 28^\circ} = 10.65$

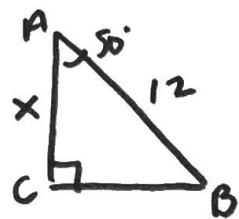
Directions: Draw a triangle to represent the trigonometric ratio. Then find the missing side.



\* Use Pyth. Theorem.

Directions: Draw a triangle to represent the situation. Then find the missing side.

16) A, B, & C are the vertices of a right triangle. Angle A = 50 degrees, and Angle C is the right angle. AB = 12. Find AC.



$\cos 50^\circ = \frac{x}{12}$