

For angle  $A$ , find the ratio of the opposite leg to the hypotenuse.

$$\frac{\text{Opposite}}{\text{Hypotenuse}} = \frac{3}{5}$$

Find the same ratio for angle  $B$ .  $\frac{o}{h} = \frac{5}{13}$

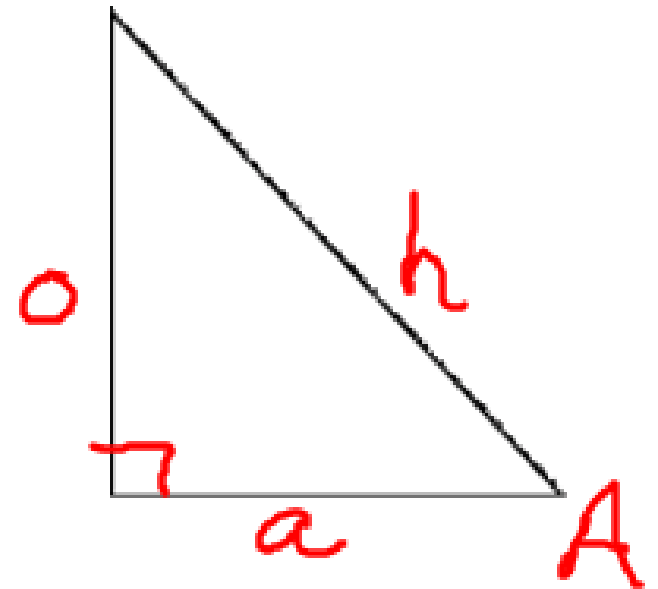
The ratio of the lengths of any 2 sides of a right triangle is a trigonometric ratio.

There are three main trigonometric ratios.

$$(sin) \underline{\text{Sine}} = \frac{\text{leg opposite to the angle}}{\text{hypotenuse}}$$

$$(cos) \underline{\text{Cosine}} = \frac{\text{leg adjacent to the angle}}{\text{hypotenuse}}$$

$$(tan) \underline{\text{Tangent}} = \frac{\text{leg opposite to the angle}}{\text{leg adjacent to the angle}}$$



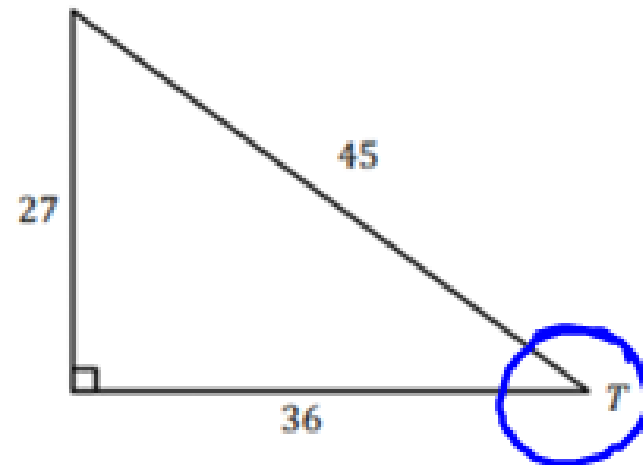
**Let's Practice!**

1. Consider the figure below.

$$\sin = \frac{27}{45} = \frac{3}{5}$$

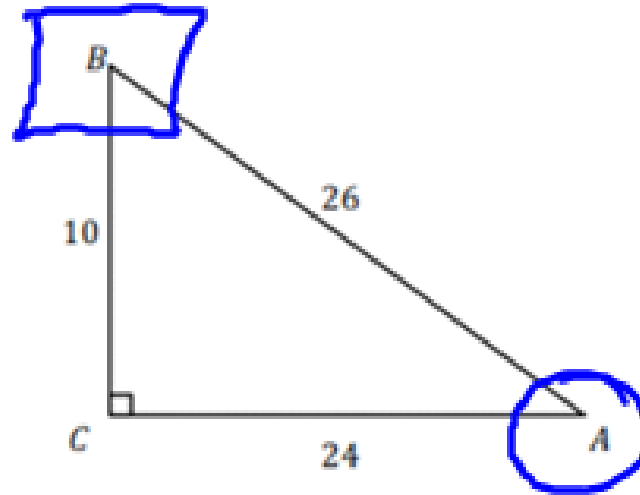
$$\cos = \frac{36}{45} = \frac{4}{5}$$

$$\tan = \frac{27}{36} = \frac{3}{4}$$



Find the sine, cosine, and tangent of  $\angle T$  for the figure.

2. Consider the figure below.



a. Find  $\sin A$  for the above triangle.

$$\frac{10}{26} = \frac{5}{13}$$

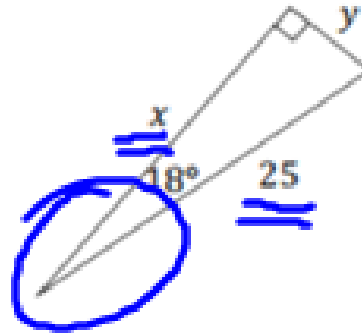
b. Find  $\cos B$  for the above triangle.

$$\frac{10}{26} = \frac{5}{13}$$

c. What do notice about the values of  $\sin A$  and  $\cos B$ ?

They are the same

3. Consider the following figure.



a. Which trigonometric function should you use to find the value of  $x$ ?

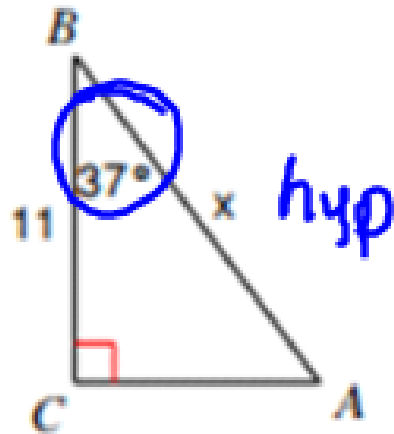
$$\cos 18$$

b. Write an equation to find  $x$  in the above figure.

$$\cos 18 = \frac{x}{25}$$

c. Find the value of  $x$  in the above figure.

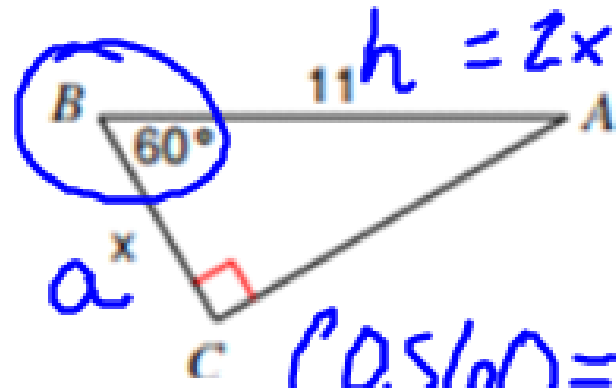
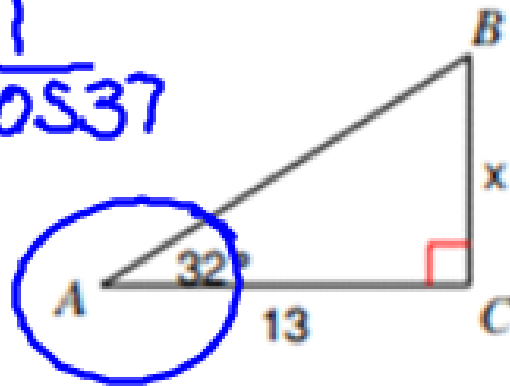
$$25 \cos 18 = x$$
$$x = 23.8$$



$$\cos 37 = \frac{11}{x}$$

$$\frac{x \cos 37}{\cos 37} = \frac{11}{\cos 37}$$

$$x = 13.8$$



$$\cos 60 = \frac{x}{11}$$

$$11 \cos 60 = x$$

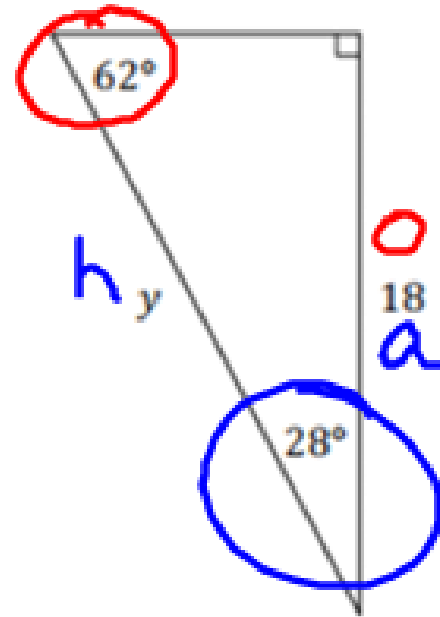
$$x = 5.5$$

$$\tan 32 = \frac{x}{13}$$

$$13 \tan 32 = x$$

$$8.1 = x$$

Consider the figure below.



$$\begin{aligned}\cos 28 &= \frac{18}{y} \\ y \frac{\cos 28}{\cos 28} &= \frac{18}{\cos 28} \\ y &= 20.4\end{aligned}$$

$$\begin{aligned}\sin 62 &= \frac{18}{y} \\ \frac{y \sin 62}{\sin 62} &= \frac{18}{\sin 62}\end{aligned}$$

Determine the value of  $y$ .