

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  $B$ .

$$\frac{opp}{h} = \frac{5}{13}$$

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

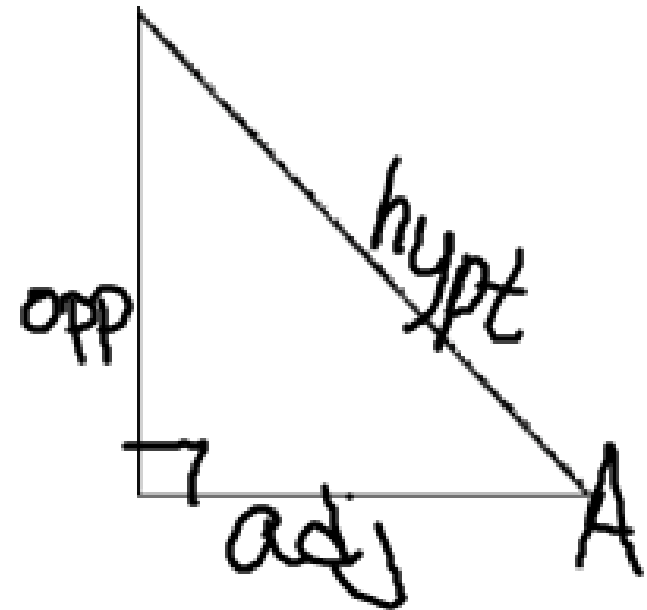
There are three main trigonometric ratios.

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

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

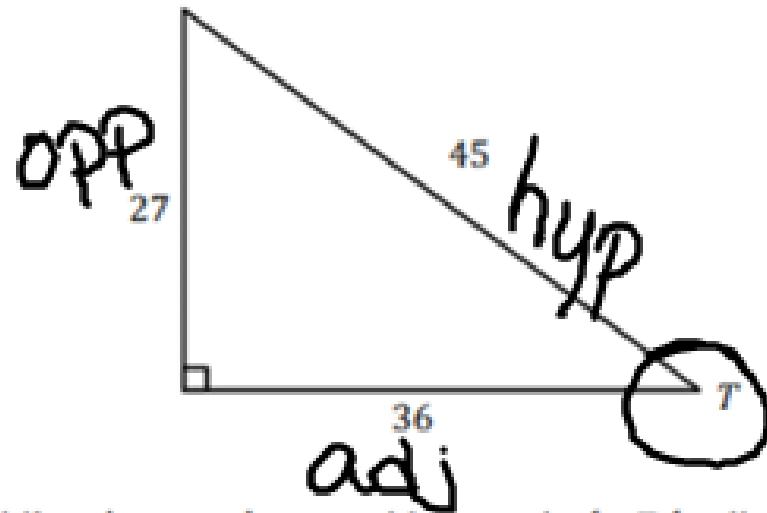
$$(tan) \underline{\text{Tangent}} = \frac{\text{leg opposite to the angle}}{\text{leg adjacent to the angle}}$$

Sohcahtoa  
o p p s o p n p j  
p s o p n p j



**Let's Practice!**

1. Consider the figure below.



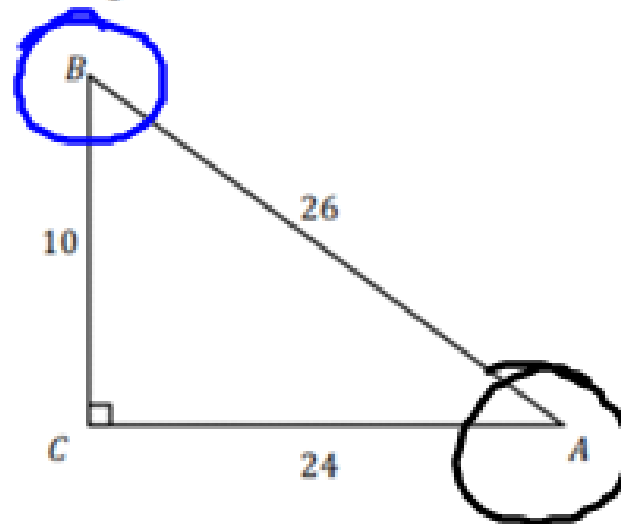
Find the sine, cosine, and tangent of  $\angle T$  for the figure.

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

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

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

2. Consider the figure below.



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

$$\sin A = \frac{o}{h} = \frac{10}{26} = \frac{5}{13}$$

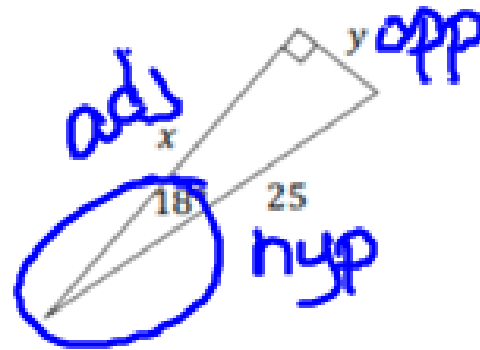
b. Find  $\cos B$  for the above triangle.

$$\cos B = \frac{a}{h} = \frac{10}{26} = \frac{5}{13}$$

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

Same values  
 $\sin A = \cos B$

3. Consider the following figure.



$$\sin 18 = \frac{y}{25}$$

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

cosine

$$25 \sin 18$$

$$y = 7.7$$

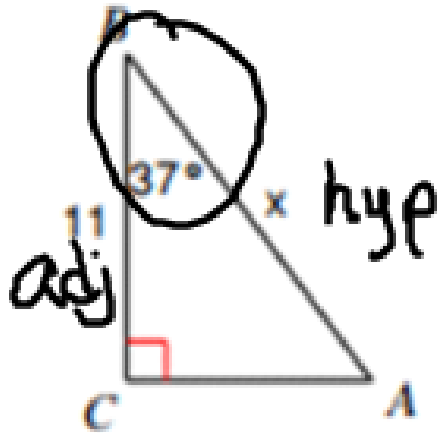
b. Write an equation to find  $x$  in the above figure.

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

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

$$25 \cos 18 = x$$

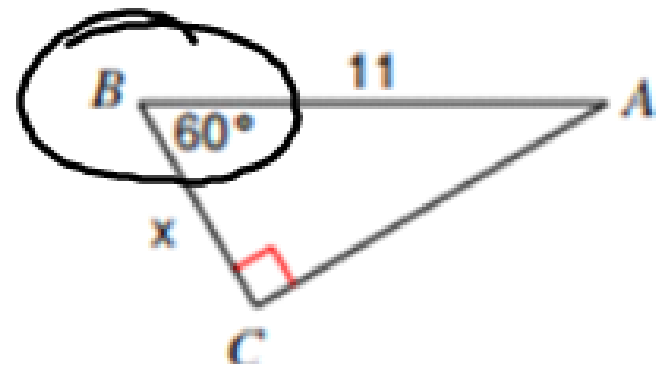
$$x = 23.8$$



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

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

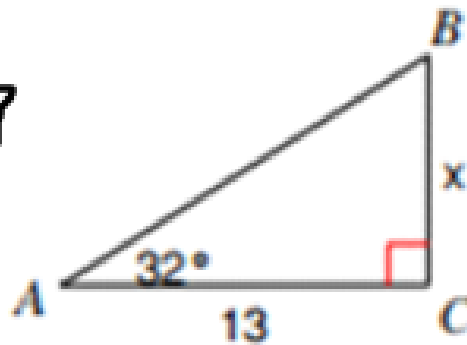
$$x = 13.8$$



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

$$11 \cos 60 = x$$

$$5.5 = x$$

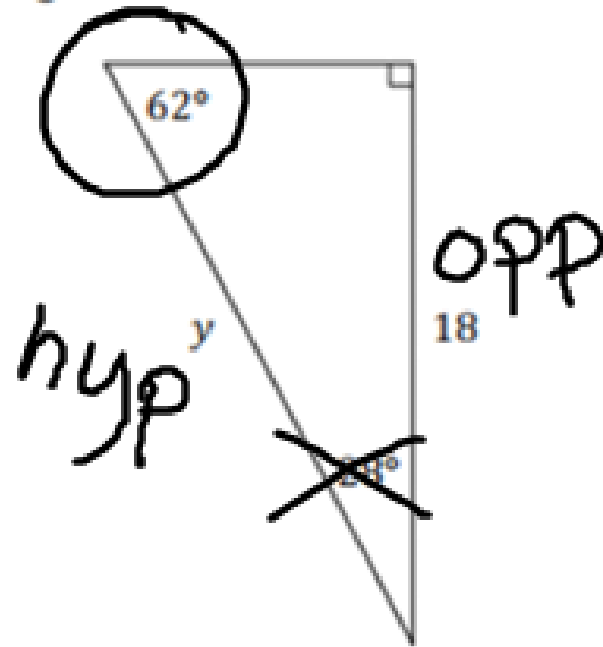


$$\tan 32 = \frac{x}{13}$$

$$13 \tan 32 = x$$

$$8.1233$$

Consider the figure below.



Determine the value of y.

$$\sin 62 = \frac{18}{y}$$

$$\frac{y \sin 62 = 18}{\sin 62} \frac{1}{\sin 62}$$
$$= 20.4$$