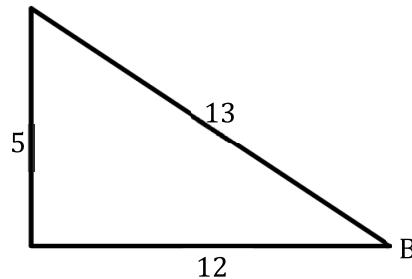
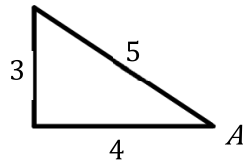


## Section 8 – Topic 8 Introduction to Trigonometry – Part 1

In previous lessons, we learned that the lengths of the sides of a right triangle have a certain relationship, which allows us to use the \_\_\_\_\_.

Consider the following right triangles.



For angle  $A$ , find the ratio of the opposite leg to the hypotenuse.  $\frac{\textit{Opposite}}{\textit{Hypotenuse}} = \text{---}$

Find the same ratio for angle  $B$ .  $\text{---} = \text{---}$

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

Let's examine the three main trigonometric ratios. Complete each of the statements below with the most appropriate answer.

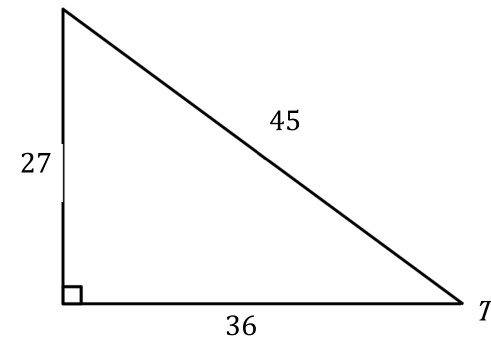
$$\text{---} = \frac{\textit{leg opposite to the angle}}{\textit{hypotenuse}}$$

$$\text{---} = \frac{\textit{leg adjacent to the angle}}{\textit{hypotenuse}}$$

$$\text{---} = \frac{\textit{leg opposite to the angle}}{\textit{leg adjacent to the angle}}$$

### **Let's Practice!**

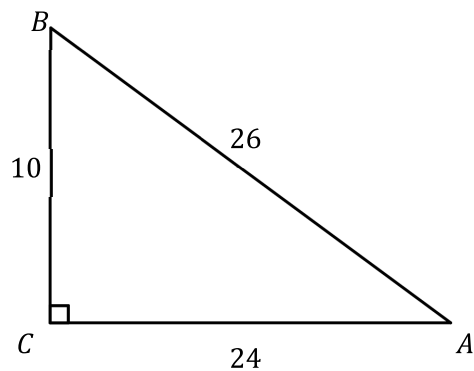
1. Consider the figure below.



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

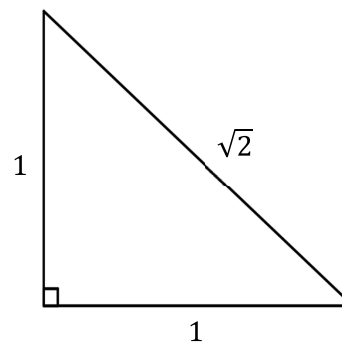
**Try It!**

2. Consider the figure below.



- a. Find  $\sin A$  for the above triangle.
- b. Find  $\cos B$  for the above triangle.
- c. What do notice about the values of  $\sin A$  and  $\cos B$ ?

Now, let's consider the figure below.



The triangle above is a special right triangle known as the \_\_\_\_\_ triangle. We know that the two non-right angles measure \_\_\_\_\_.

Write proportions for  $\sin$ ,  $\cos$ , and  $\tan$  of the acute angles of the triangle.

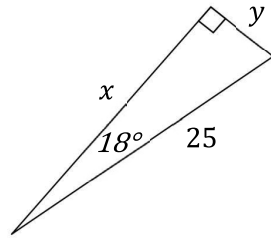
Use a calculator to verify the proportions.

If there is an unknown length, we can set up an equation to find it.



**Let's Practice!**

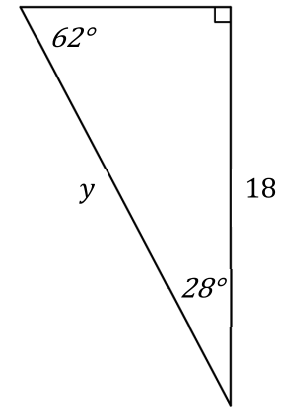
3. Consider the following figure.



- Which trigonometric function should you use to find the value of  $x$ ?
- Write an equation to find  $x$  in the above figure.
- Find the value of  $x$  in the above figure.

**Try It!**

4. Consider the figure below.



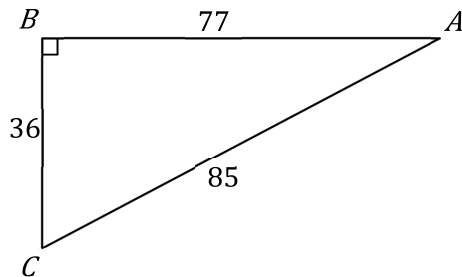
Determine the value of  $y$ .

**Section 8 – Topic 9**  
**Introduction to Trigonometry – Part 2**

Given the lengths of sides, we can use “trig” functions to find missing angles by using their inverses:  $\sin^{-1}$ ,  $\cos^{-1}$ , and  $\tan^{-1}$ .

**Let's Practice!**

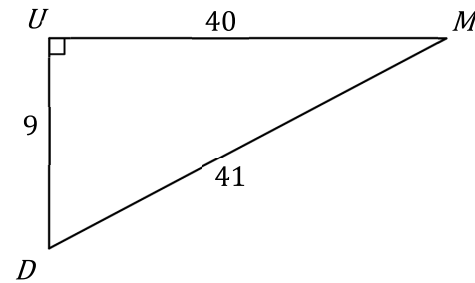
1. Consider the triangle below.



Find  $\cos C$ ,  $\sin A$ ,  $m\angle A$  and  $m\angle C$  for the above triangle.

**Try It!**

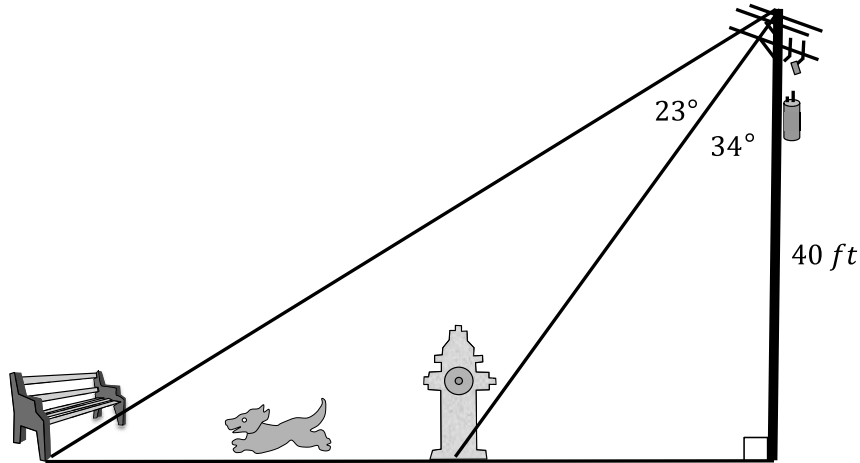
2. Consider the triangle below.



Find  $\tan M$ ,  $\cos D$ ,  $m\angle D$  and  $\sin M$  for the above triangle.

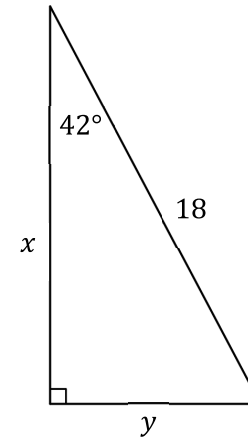
### BEAT THE TEST!

1. The picture below shows the path that Puppy Liz is running. The electrical post is 40 feet tall. Puppy Liz usually starts at the bench post and runs until she gets to the fire hydrant, rests, and then she runs back to the bench. How far does Puppy Liz run to get to the fire hydrant?



Puppy Liz runs  feet.

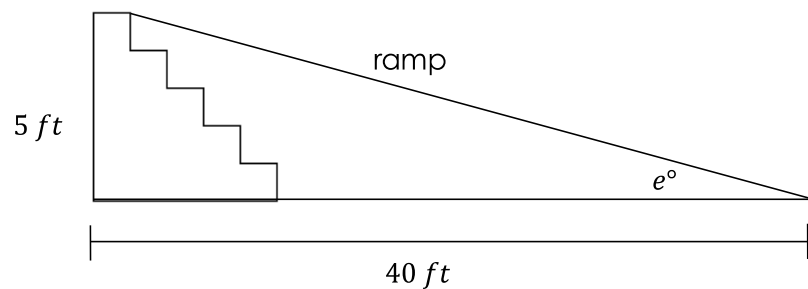
2. Consider the triangle below.



Which of the following measurements represents the perimeter and area of the triangle above?

- (A) Perimeter: 80.55 units  
Area: 43.42 square units
- (B) Perimeter: 43.42 units  
Area: 80.55 square units
- (C) Perimeter: 21.71 units  
Area: 161.03 square units
- (D) Perimeter: 161.03 units  
Area: 21.71 square units

3. Yandel will place a ramp over a set of stairs at the backyard entrance so that one end is 5 feet off the ground. The other end is at a point that is a horizontal distance of 40 feet away, as shown in the diagram. The angle of elevation of the ramp is represented by  $e^\circ$ . Each step of the stair is one foot long.



What is the angle of elevation to the nearest tenth of a degree?