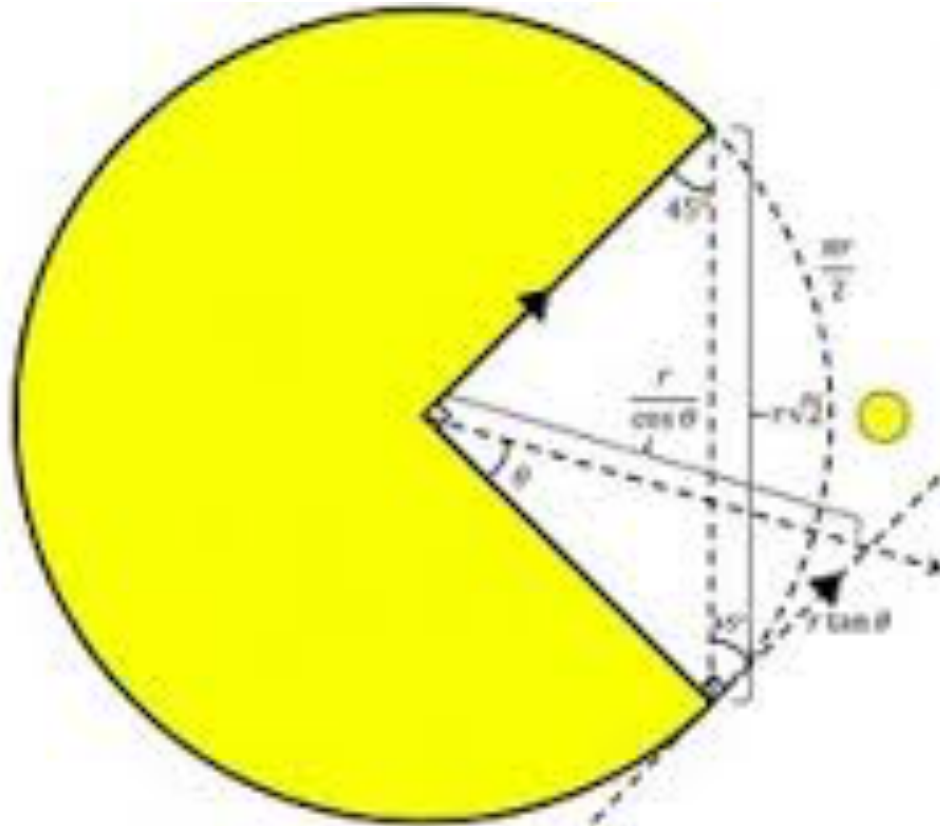


# Trigonometric Ratios



TrigoNOMNOMNOMetry

By the end of this lesson, I will be able to answer the following questions...

1. What are sine, cosine and tangent - and how do I use them?
2. How do I use my calculator to find sine, cosine and tangent?
3. What are  $\sin^{-1}$ ,  $\cos^{-1}$ , and  $\tan^{-1}$  and how do I use them?

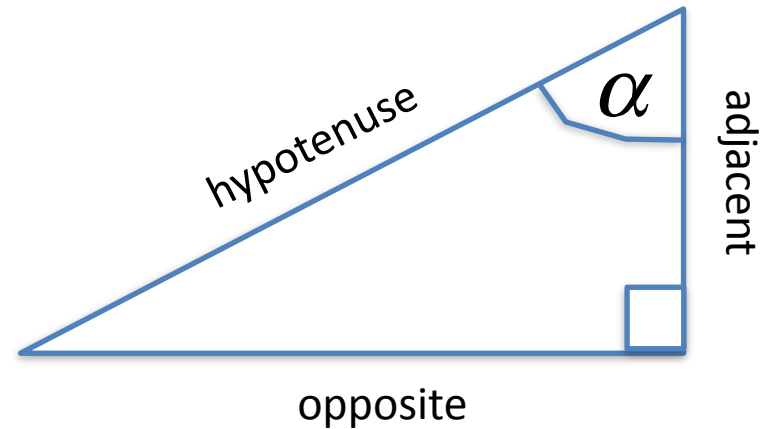
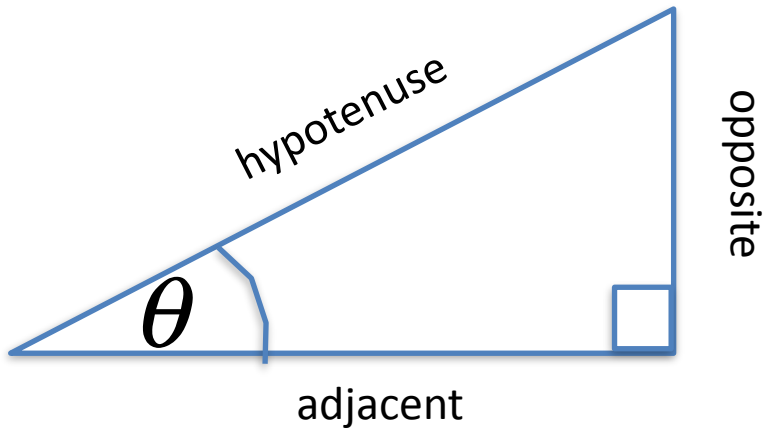
# Vocabulary

$$\text{Sine} = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\text{Cosine} = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\text{Tangent} = \frac{\text{opposite}}{\text{adjacent}}$$

$\theta \rightarrow$  Theta     $\alpha \rightarrow$  Alpha     $\beta \rightarrow$  Beta



# Prerequisite Skills with Practice

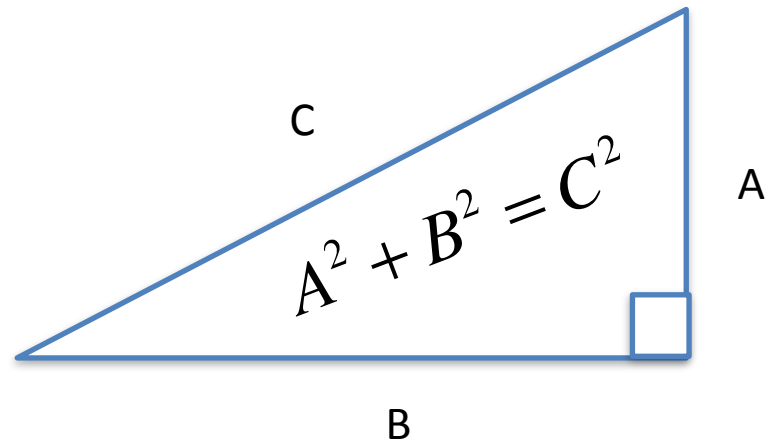
## Calculator Exercise

$$\sin 48^\circ$$

$$\cos 70^\circ$$

$$\tan 23^\circ$$

## Pythagorean Theorem



SEE VIDEO ON PlottsMath FOR EXTRA EXAMPLES!!



Defining Sine, Cosine and Tangent.

$$\sin A =$$

$$\cos A =$$

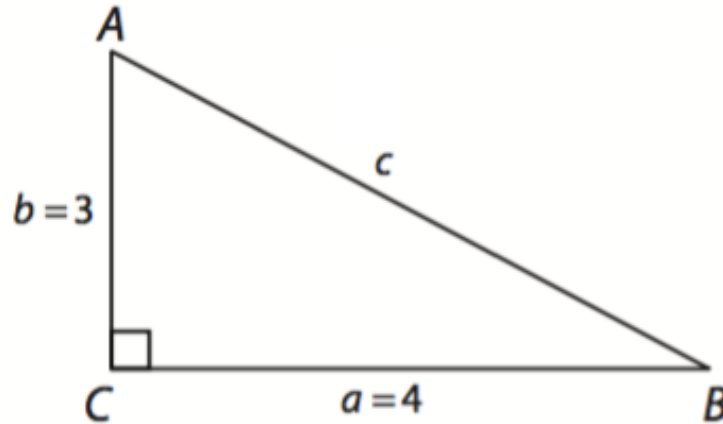
$$\tan A =$$

$$\sin B =$$

$$\cos B =$$

$$\tan B =$$

Find the sine, cosine, and tangent ratios for  $\angle A$  and  $\angle B$  in  $ABC$ . Convert the ratios to decimal equivalents.



How does the Calculator get THAT?

$$\sin A =$$

$$\cos A =$$

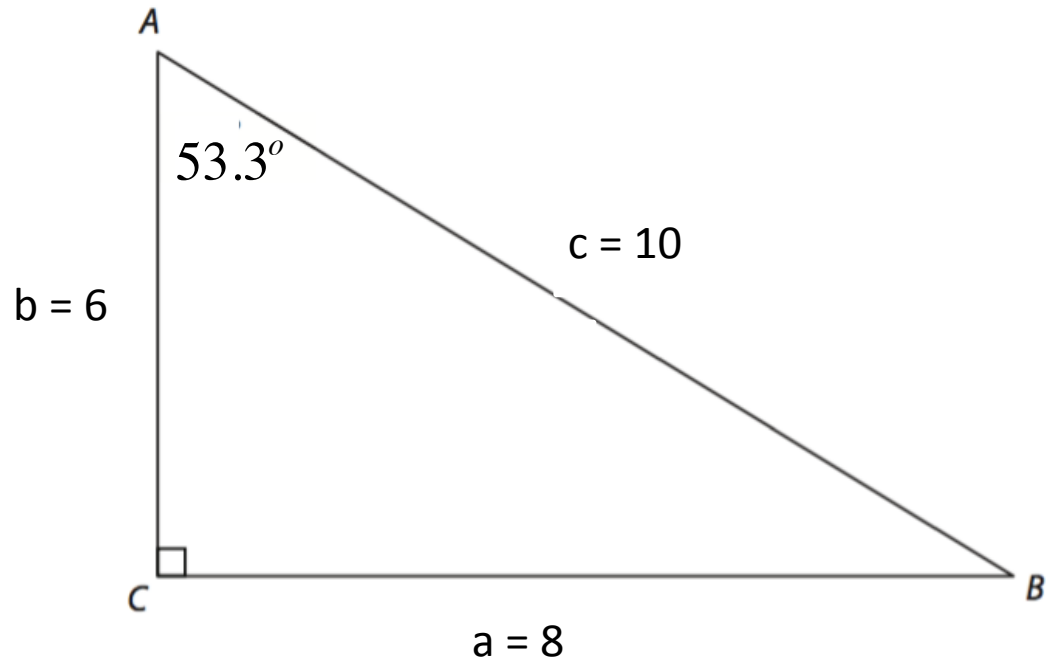
$$\tan A =$$

$$\sin B =$$

$$\cos B =$$

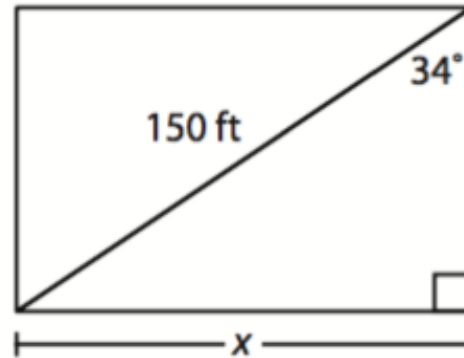
$$\tan B =$$

Given the triangle below, set up the three trigonometric ratios of sine, cosine, and tangent for the angle given. Compare these ratios to the trigonometric functions using your calculator.

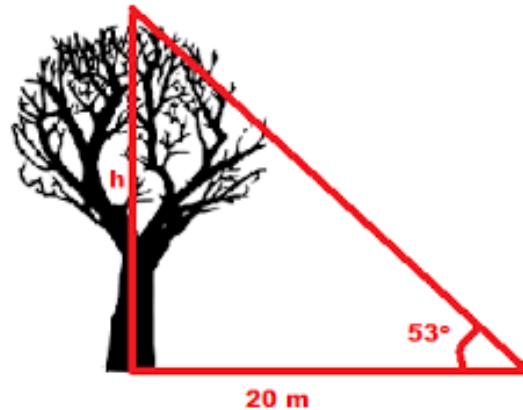


Solving word problems  
and diagrams

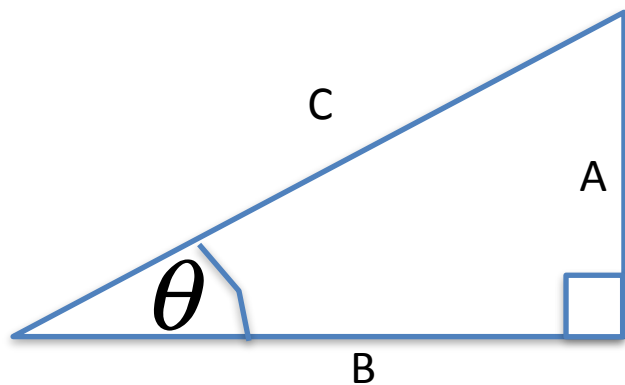
Leo is building a concrete pathway 150 feet long across a rectangular courtyard, as shown below. What is the PERIMETER of the courtyard,  $x$ , to the nearest thousandth?



Find the height of the  
tree using trigonometry



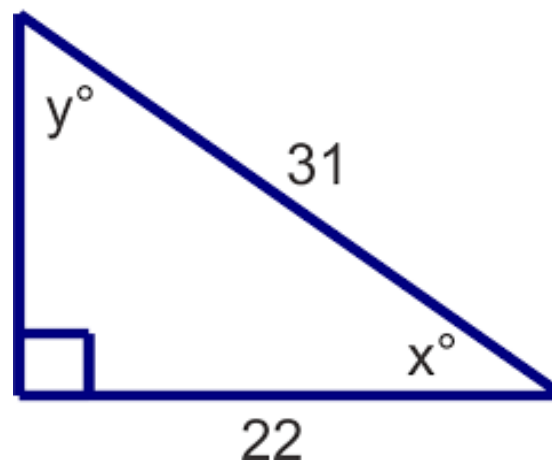
How do I find unknown angles of right triangles using trig?



$$\sin(\theta) = \frac{A}{C} \Rightarrow \theta = \sin^{-1}\left(\frac{A}{C}\right)$$

$$\cos(\theta) = \frac{B}{C} \Rightarrow \theta = \cos^{-1}\left(\frac{B}{C}\right)$$

$$\tan(\theta) = \frac{A}{B} \Rightarrow \theta = \tan^{-1}\left(\frac{A}{B}\right)$$

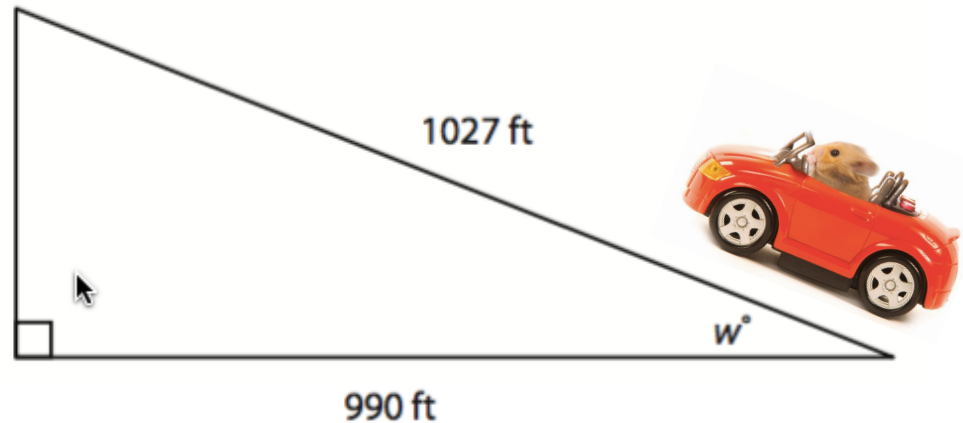


Find the degree measures of “x” and “y”



How do I find unknown angles of right triangles using trig?

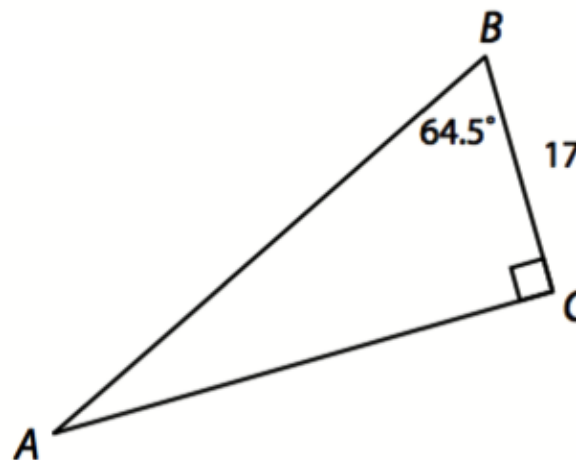
A hamster drives 1,027 feet up a hill that has a constant slope. When the hamster reaches the top of the hill, he has traveled a horizontal distance of 990 feet. At what angle did the hamster drive to reach the top? Round your answer to the nearest degree.



Solving a Triangle - Finding ALL sides lengths and angles

Building triangles from descriptions

Solve the right triangle below. Round sides to the nearest thousandth.



In  $TRY$ ,  $\angle Y$  is a right angle and  $\tan T = \frac{8}{15}$ . What is  $\sin R$ ? Express the answer as a fraction and as a decimal.

# THE END



Visit [PlottsMath](#) for assignment details