

## Warm Up:

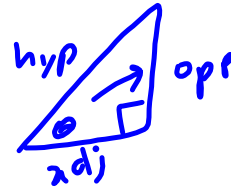
1. Write the general ratios for  $\sin\theta$ ,  $\cos\theta$  and  $\tan\theta$ .

$$\sin\theta = \frac{\text{opp}}{\text{hyp}} \quad \cos\theta = \frac{\text{adj}}{\text{hyp}} \quad \tan\theta = \frac{\text{opp}}{\text{adj}}$$

2. Your friend wants to solve a problem using trigonometry. He is struggling to identify the sides of a triangle. How would you describe "opposite" and "adjacent" to him?

3. Simplify  $\sqrt{18}$

$$\begin{array}{l} 18 \\ \wedge \\ 2 \quad 9 \\ \textcircled{3} \quad \textcircled{3} \end{array} \quad 3\sqrt{2}$$



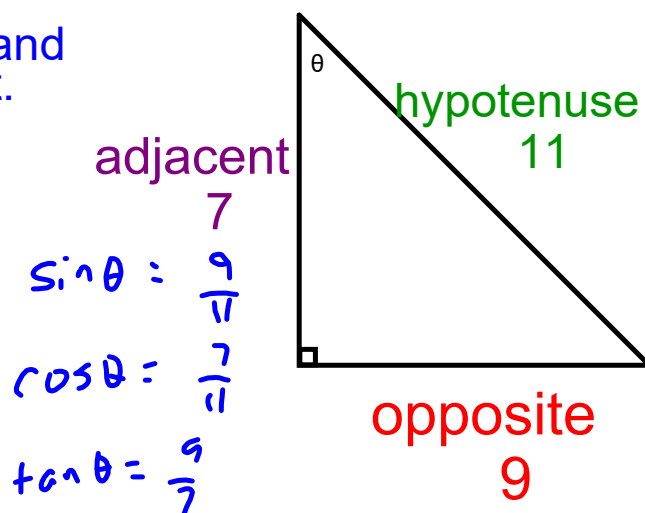
**Learning Goal:** Today I will learn how to solve for an unknown angle using trigonometry.

**Success Criteria:** I am able to choose the correct ratio and solve for an angle.

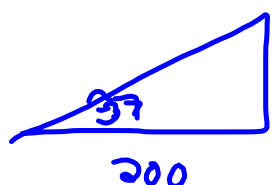
## 8.3 Trigonometry

## Review

Write the ratios for  $\sin\theta$ ,  $\cos\theta$  and  $\tan\theta$  using the diagram at right.



You visit Europe and decide to check out all the cathedrals. You are standing 200 feet away from Notre Dame in Paris and are looking up at the stained glass windows at a  $37^\circ$  angle. How far from the ground is the window?



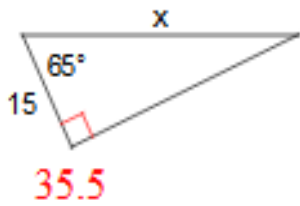
$$\tan 37 = \frac{x}{200}$$

$$x = 200 \tan 37$$

$$x = 150.7 \text{ ft}$$

Find the missing side. Round to the nearest tenth.

1)

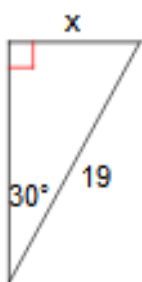


$$\cos 65 = \frac{15}{x}$$

$$x = 15 / \cos 65$$

35.5

3)

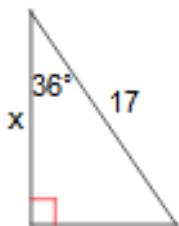


$$\sin 30 = \frac{x}{19}$$

$$19 \sin 30 = x$$

9.5

5)

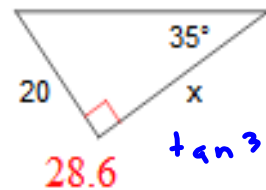


$$\cos 36 = \frac{x}{17}$$

$$17 \cos 36 = x$$

13.8

2)

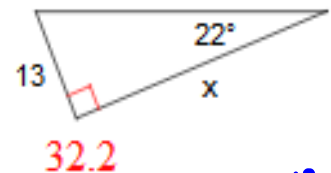


28.6

$$\tan 35 = \frac{20}{x}$$

$$x = 20 / \tan 35$$

4)

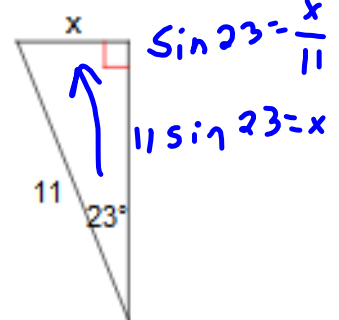


32.2

$$\tan 22 = \frac{13}{x}$$

$$x = 13 / \tan 22$$

6)



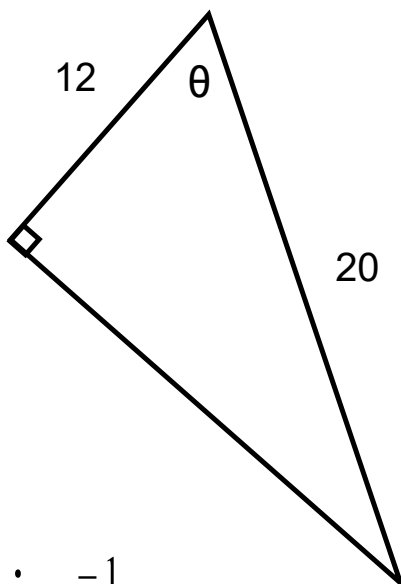
4.3

$$\sin 23 = \frac{x}{11}$$

$$11 \sin 23 = x$$

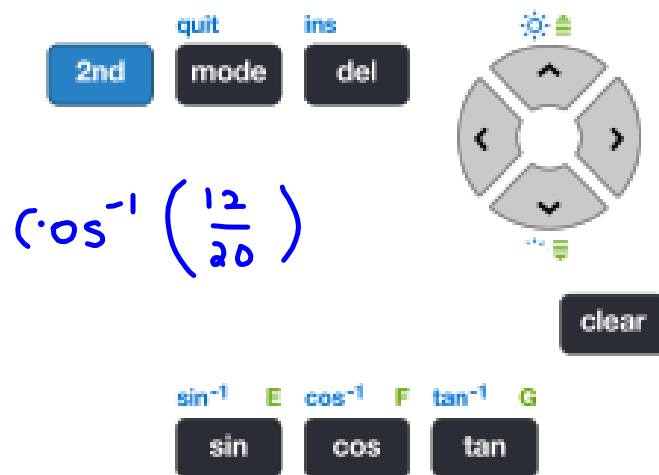
## Trigonometry

To find an angle if you know the side lengths, you have to use **inverse operations**.



$$\sin^{-1}$$

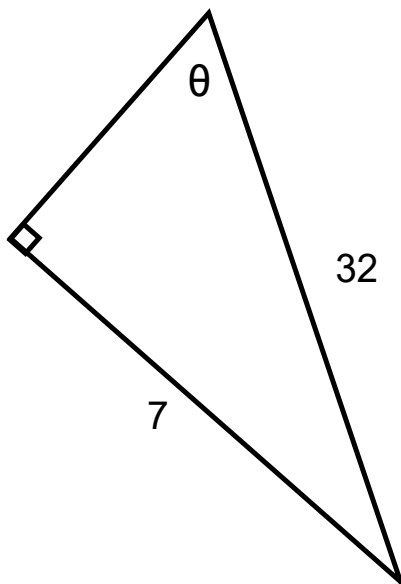
$$\cos^{-1} \quad \tan^{-1}$$



To get to the top row, you must hit 2nd then the button

## Trigonometry

To find an angle if you know the side lengths, you have to use inverse operations.



Which trig function are you using?

Set up the trig function with the ratio.

$$\sin \theta = \frac{7}{32}$$

Now using the inverse key, find the angle.

$$\sin^{-1}\left(\frac{7}{32}\right)$$

$$\theta = 12.6^\circ$$

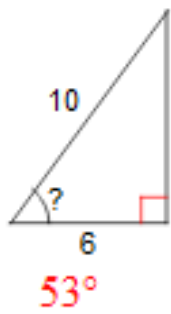


## Trigonometry

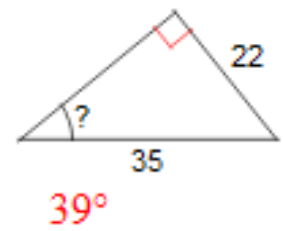
	To find a side	To find an angle
$\sin \theta$	$\sin \theta = \frac{O}{H}$	$\theta = \sin^{-1} \left( \frac{O}{H} \right)$
$\cos \theta$	$\cos \theta = \frac{A}{H}$	$\theta = \cos^{-1} \left( \frac{A}{H} \right)$
$\tan \theta$	$\tan \theta = \frac{O}{A}$	$\theta = \tan^{-1} \left( \frac{O}{A} \right)$

**Closure:** Today I learned how to set up a trigonometric ratio to solve for an angle.

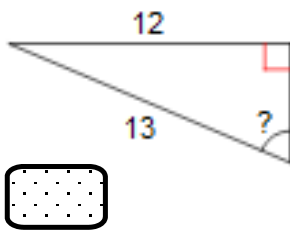
1)



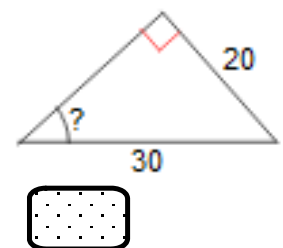
2)

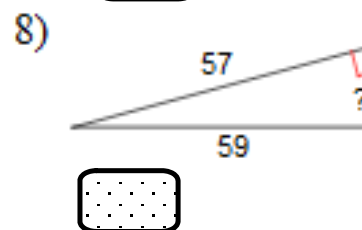
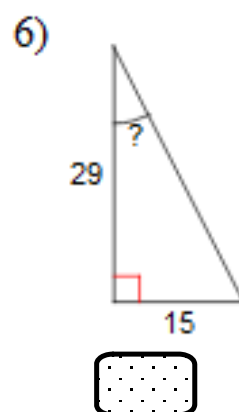
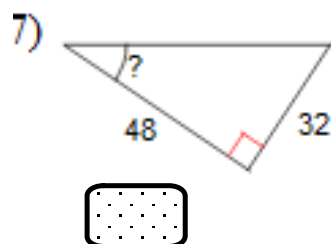
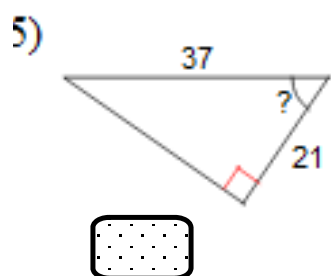


3)



4)

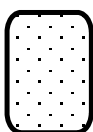




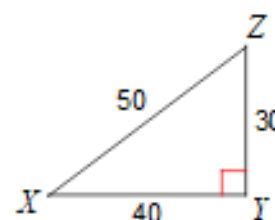
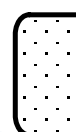
## Whiteboard Practice

Find the value of each trigonometric ratio.

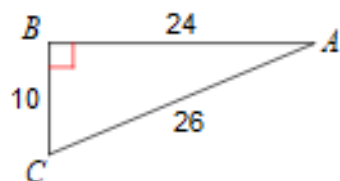
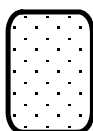
1)  $\sin X$



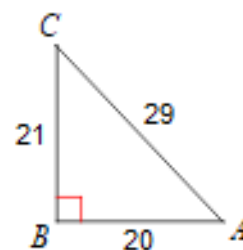
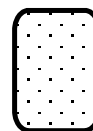
2)  $\sin X$



3)  $\cos C$

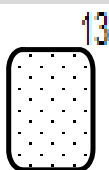
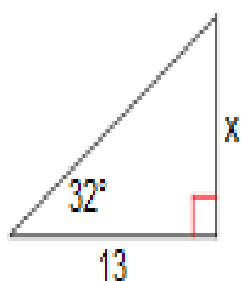


4)  $\tan A$

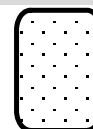
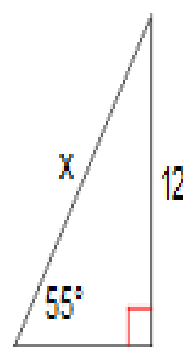


Find the missing side. Round to the nearest tenth.

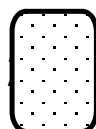
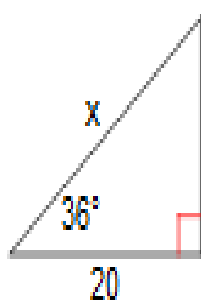
5)



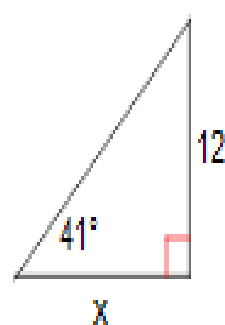
6)



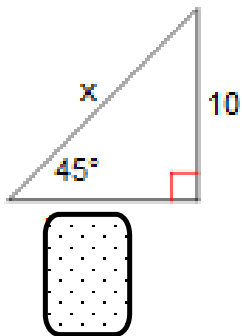
7)



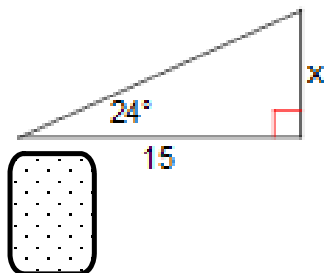
8)



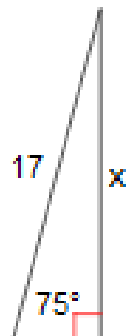
9)



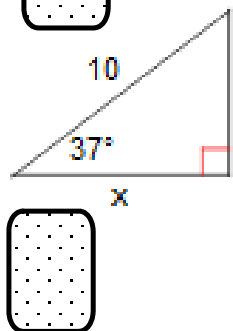
11)



10)

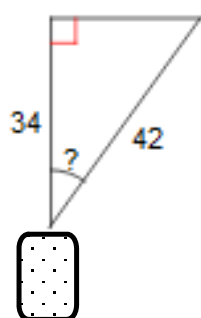


12)

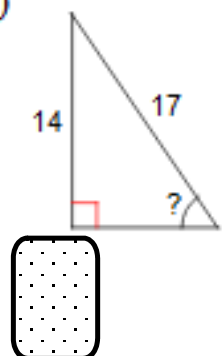


Find the measure of the indicated angle to the nearest degree.

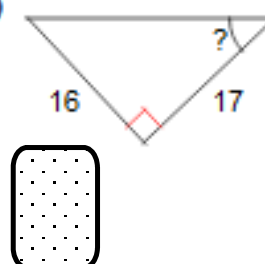
13)



15)



14)



16)

