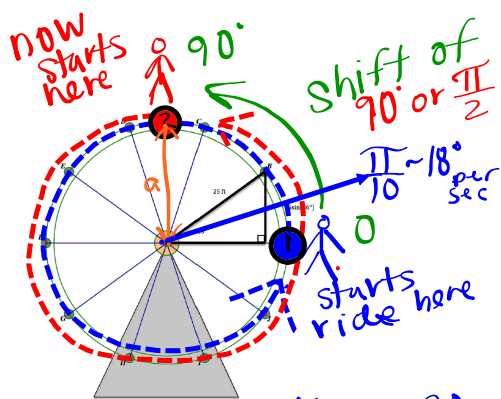


6.10

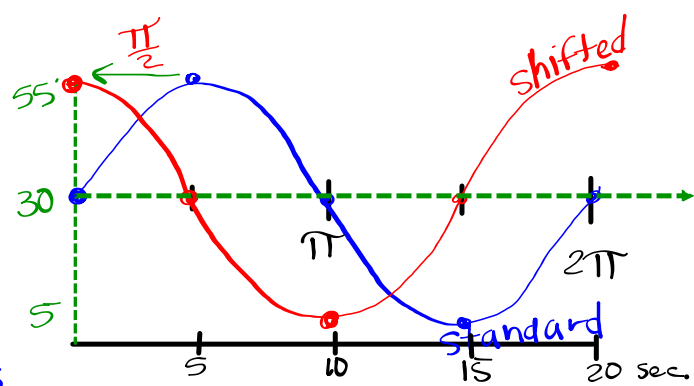


Speed: One rotation in 20secs.

degree  $\frac{360^\circ}{20\text{sec}} = 18^\circ$  per sec

radian  $\frac{2\pi}{20} = \frac{\pi}{10}$  every sec =  $b$

$$y = a \sin(bx - c) + d$$



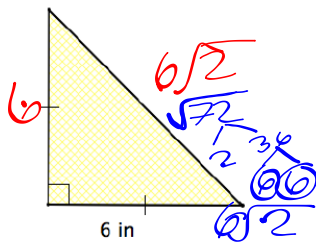
$$y = 25 \sin\left(\frac{\pi}{10}x + \frac{\pi}{2}\right) + 30$$

$$y = 25 \sin\left(\frac{\pi}{10}x\right) + 30$$

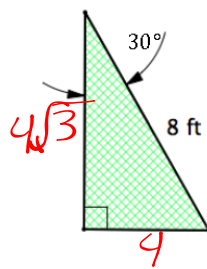
Fill in all of the missing measures in the triangles.

Quiz

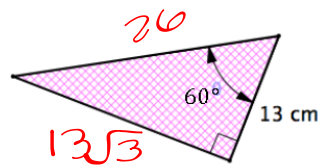
9.



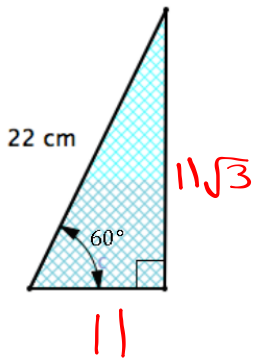
10.



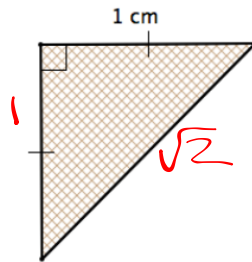
11.



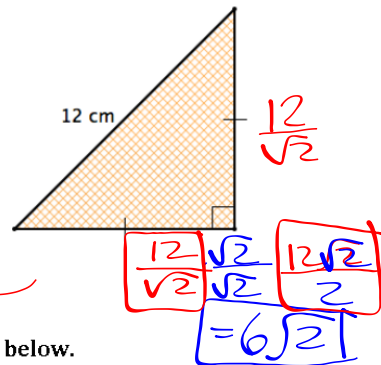
12.



13.



14.



Use an appropriate triangle from above to fill in the function values below.

Name \_\_\_\_\_

Trigonometric Functions | 6.10

**Ready, Set, Go!**

**Ready** Topic: Functions and their inverses

Indicate which of the following functions have an inverse that is a function. If the function has an inverse, sketch it in.

(Remember, the inverse will reflect across the  $y = x$  line. Sketch that in, too.) Finally, label each one as *even*, *odd*, or *neither*. Recall that an *even* function is symmetric with the  $y$ -axis, while an *odd* function is symmetric with respect to the origin.



1. *not a function*

2. *even* *odd* *not a function*

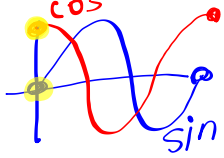
3. *not a function* *odd* *not a function*

4. *not a function* *even* *not a function*

*function* *neither*

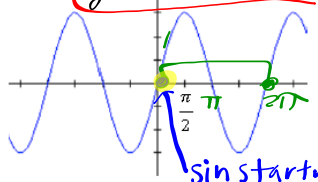
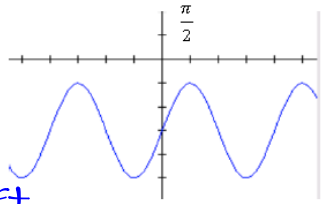
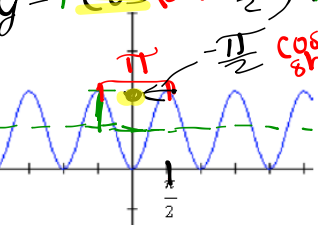
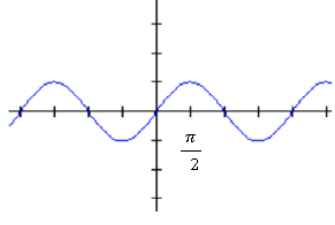
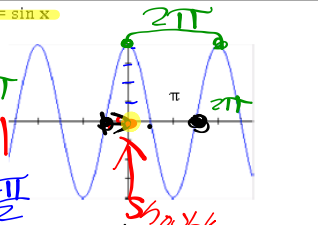
*y = x*

Detailed description: This section contains four coordinate planes labeled 1 through 4. Each plane shows a curve and a dashed line representing the inverse function, which is a reflection of the original curve across the line y=x. Graph 1 shows a curve that fails the vertical line test, with handwritten notes 'not a function' and a red 'X' on the curve. Graph 2 shows a curve symmetric about the y-axis, with handwritten notes 'even' and 'not a function'. Graph 3 shows a curve symmetric about the origin, with handwritten notes 'odd' and 'not a function'. Graph 4 shows a curve symmetric about the y-axis, with handwritten notes 'even' and 'not a function'. Graph 5 (labeled 3 in the image) shows a curve that is not symmetric about either axis, with handwritten notes 'function' and 'neither'. Graph 6 (labeled 4 in the image) shows a curve that is not symmetric about either axis, with handwritten notes 'not a function'. A dashed line labeled 'y=x' is drawn across the middle of the graphs.



$y = a \sin\left(\frac{b}{\text{period}}x + c\right) + d$   
*a*: amp radius  
*b*: speed  $b = \frac{2\pi}{\text{period}}$  (length of one rotation)  
*c*: phase shift (opposite)  
*d*: mid-line, vertical shift

Notes

<p>5. <math>y = \sin x</math></p> <p><math>a = 3</math>              period <math>= 2\pi</math>  <math>b = \frac{2\pi}{2\pi} = 1</math>              c = no shift              d = center @ 0</p>	<p><math>y = 3 \sin(x + 0) + 0</math>  <math>y = 3 \sin(x)</math></p>  <p>sin starts w/ no shift</p>	<p>6. <math>y = \sin x</math></p> 
<p>7. <math>y = \cos x</math></p> <p><math>a = 1</math>              period <math>= 2\pi</math>              Speed <math>= \frac{2\pi}{2\pi}</math>              c: The graph is shifted forward <math>\frac{\pi}{2}</math> to fix <math>-\frac{\pi}{2}</math>              d = 1</p>	<p><math>y = 1 \cos\left(x - \frac{\pi}{2}\right) + 1</math></p>  <p>cosine should start (or <math>+\frac{\pi}{2}</math>)</p>	<p>8. <math>y = \cos x</math></p> 
<p>9. <math>y = \sin x</math></p> <p><math>a = 4</math>              period: <math>2\pi</math>              Speed <math>= \frac{2\pi}{2\pi} = 1</math>              phase shift <math>-\frac{\pi}{2}</math>              d = 0</p>	<p><math>y = 4 \sin\left(x + \frac{\pi}{2}\right)</math></p>  <p>Should start <math>+\frac{\pi}{2}</math> fix it</p>	<p>10. The cofunction identity states that <math>\sin \theta = \cos(90^\circ - \theta)</math> and <math>\sin(\theta - 90^\circ) = \cos \theta</math>. How does this identity relate to the graph in #9?</p> <p>Explain where you would see this identity in a right triangle.</p>

Tells where it should be. Fixed. (describes how to get to zero)

Name \_\_\_\_\_

Trigonometric Functions | 6.10

Describe the relationships between the graphs of  $f$  (solid) and  $g$  (dotted). Then write their equations.

11. *Solid  $y =$*   
*dashed  $y =$*

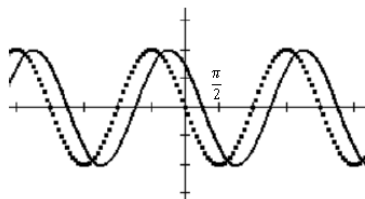
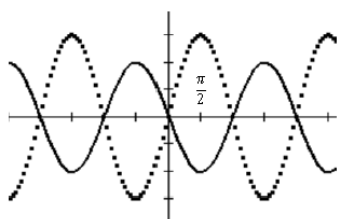
12. *Solid:  $y = 2 \cos(\frac{1}{2}x)$*   
*dashed:  $y = 2 \cos(2x)$*

$b = \frac{2\pi}{\frac{1}{2}} = 4$

$b = \frac{2\pi}{2} = \pi$

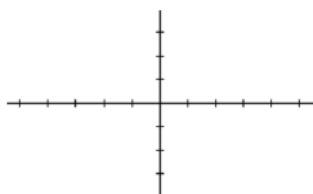
*dashed is 4 times faster*

13. This graph could be interpreted as a shift or a reflection. Write the equations both ways.



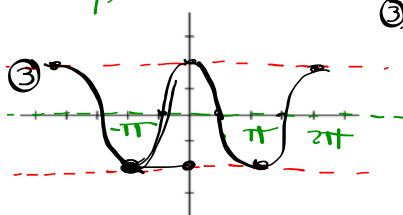
Sketch the graph of the function. (Include 2 full periods. Label the scale of your horizontal axis.)

15.  $y = 3 \sin(x - \frac{\pi}{2})$



16.  $y = -2 \cos(x + \pi) + 0$

*flip over x back π*



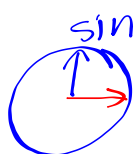
*standard*  
*① cos*

*②*

*speed*  
 $1 = \frac{2\pi}{\text{period}}$   
*period = 2π*

Go

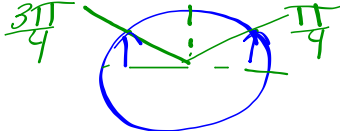
Topic: Trig ratios in the unit circle

Name two values for  $\theta$  (angles of rotation) that have the given trig ratio.  $0 < \theta \leq 2\pi$ .

$\rightarrow 45 = \frac{\pi}{4}$

17.  $\sin \theta = \frac{\sqrt{2}}{2}$

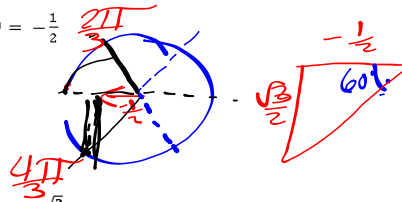
18.  $\cos \theta = \frac{\sqrt{2}}{2}$



20.  $\sin \theta = 0$

21.  $\sin \theta = -\frac{\sqrt{3}}{2}$

19.  $\cos \theta = -\frac{1}{2}$



22.  $\cos \theta = -\frac{\sqrt{3}}{2}$

23. For which angles of rotation does  $\sin \theta = \cos \theta$ ?