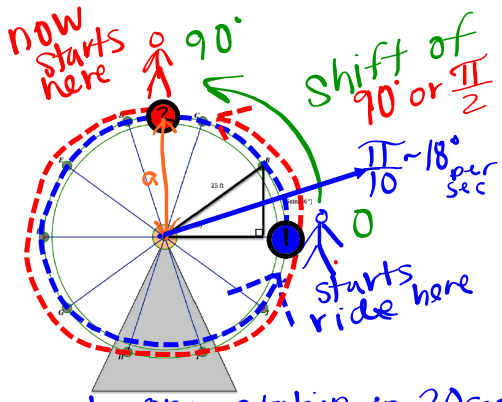
6.10

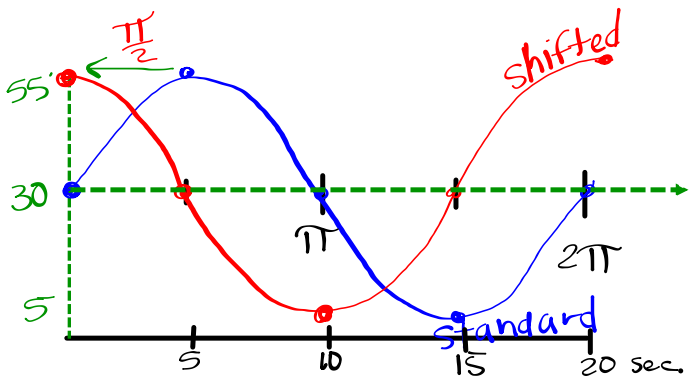
$y = a\sin(bx - c) + d$



Speed: One rotation in 20secs.

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

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



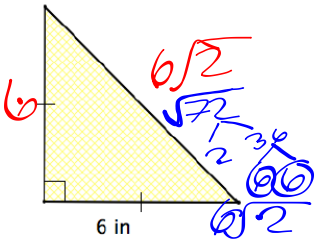
$y = 25\sin\left(\frac{\pi}{10}x + \frac{\pi}{2}\right) + 30$

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

Fill in all of the missing measures in the triangles.

Quiz

9.



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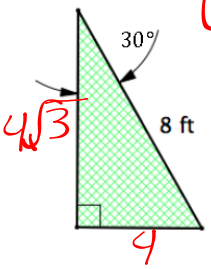
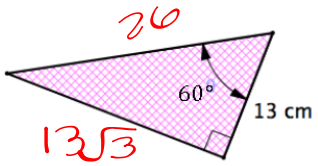
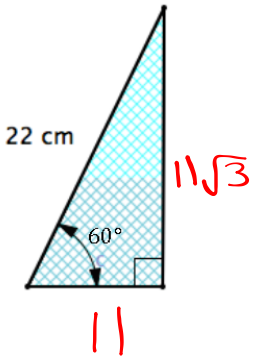


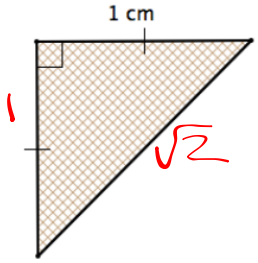
11.



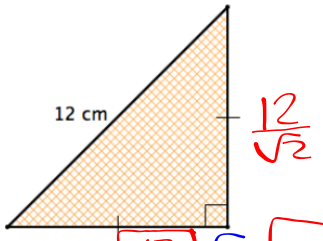
12.



13.



14.



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

Name Trigonometric Functions | 6.10

Ready, Set, Go!

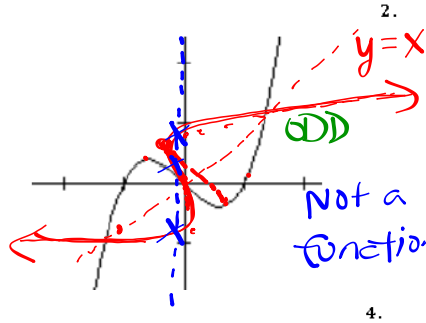
Ready Topic: Functions and their inverses

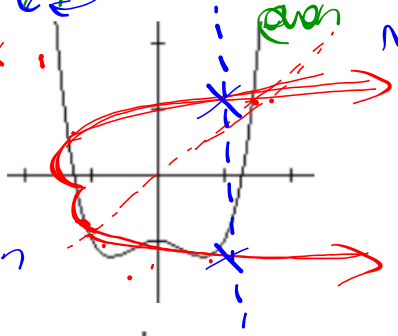
Indicate which of the following functions have an inverse that is a function. If the function has an inverse, sketch it in. (Remember, the inverse will reflect across the y = x line. Sketch that in, too.) Finally, label each one as *even*, *odd*, or *neither*. Recall that an *even* function is symmetric with the y-axis, while an *odd* function is symmetric with respect to the origin.

1. not a function

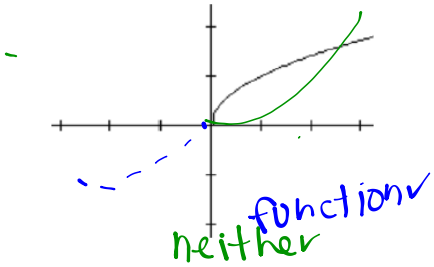
even

2. odd

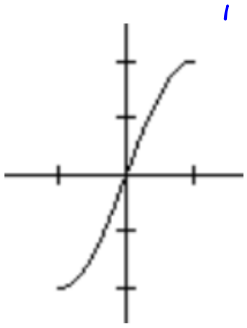


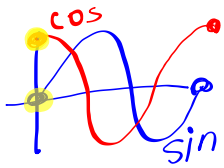


3.



4.





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

a: amp, radius

b: speed, $b = \frac{2\pi}{\text{period}}$ (length of one rotation)

c: phase shift (opposite)

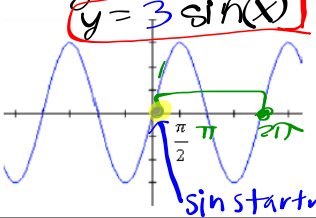
d: mid-line, vertical shift

Notes

5. y = sin x

$y = 3\sin(1x + 0) + 0$

$y = 3\sin(x)$



a = 3

period = 2π

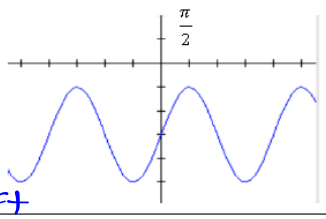
$b = \frac{2\pi}{2\pi} = 1$

c = no shift

d = center @ 0.

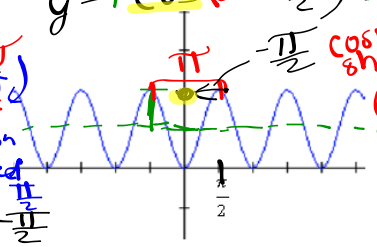
sin start w/ no shift

6. y = sin x



7. y = cos x

$y = 1\cos(1x - \frac{\pi}{2}) + 1$



a = 1

period: π

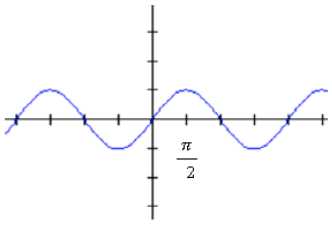
speed $\frac{2\pi}{\pi}$

c: The graph is shifted forward $\frac{\pi}{2}$ to fix $-\frac{\pi}{2}$

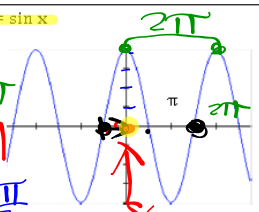
cosine should start (or $+\frac{\pi}{2}$)

d = 1

8. y = cos x



9. y = sin x



a = 4

period: 2π

speed $= \frac{2\pi}{2\pi} = 1$

phase shift $-\frac{\pi}{2}$

d = 0

should start $+\frac{\pi}{2}$ fix it

10. The cofunction identity states that $\sin\theta = \cos(90° - \theta)$ *and* $\sin(\theta - 90°) = \cos\theta$. How does this identity relate to the graph in #9?

Explain where you would see this identity in a right triangle.

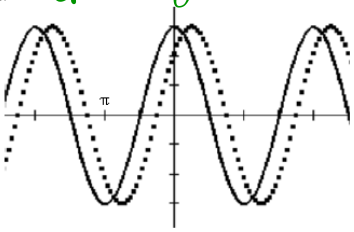
$y = 4\sin(x + \frac{\pi}{2})$

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

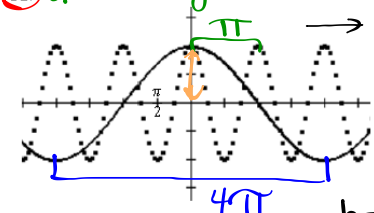
Name Trigonometric Functions | 6.10

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

11. solid $y =$ dashed $y =$



12. solid: $y = 2\cos\left(\frac{1}{2}x\right)$ dashed: $y = 2\cos(2x)$

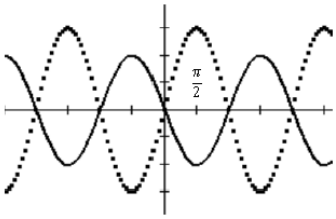


$\rightarrow b = \frac{2\pi}{\pi} = 2$

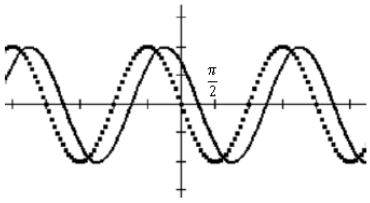
$b = \frac{2\pi}{4\pi} = \frac{1}{2}$

dashed is 4 times faster

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

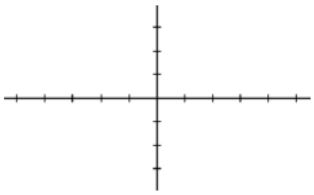


14.



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

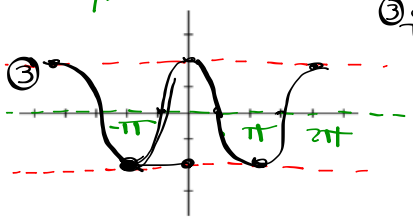
15. $y = 3\sin\left(x - \frac{\pi}{2}\right)$



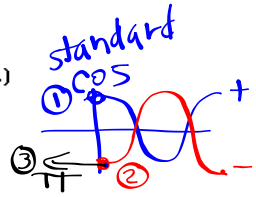
16. $y = -2\cos(x + \pi) + 0$

flip over x ↓ back π

1



standard cos



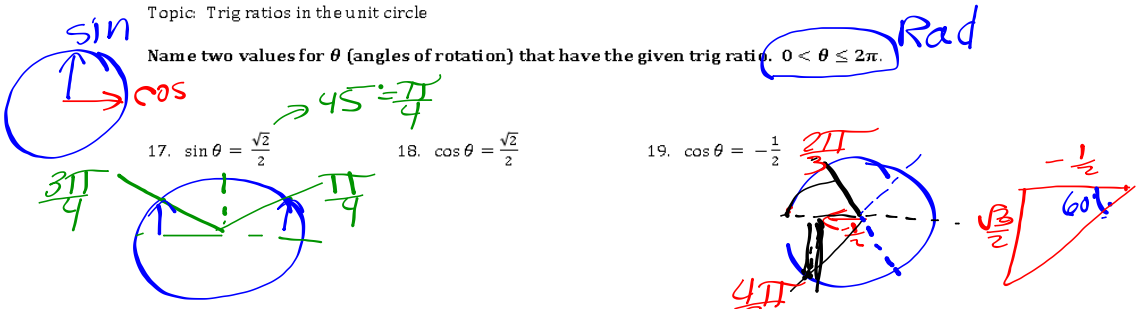
speed $1 = \frac{2\pi}{?}$

period $= 2\pi$

Go

Topic: Trig ratios in the unit circle

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



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

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

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

20. $\sin\theta = 0$

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

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

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