

Write your questions and thoughts here!

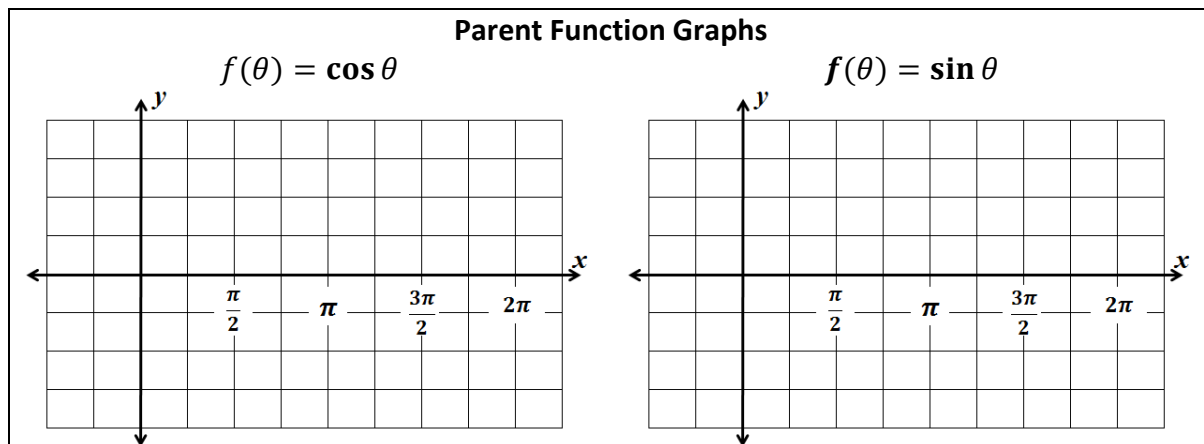
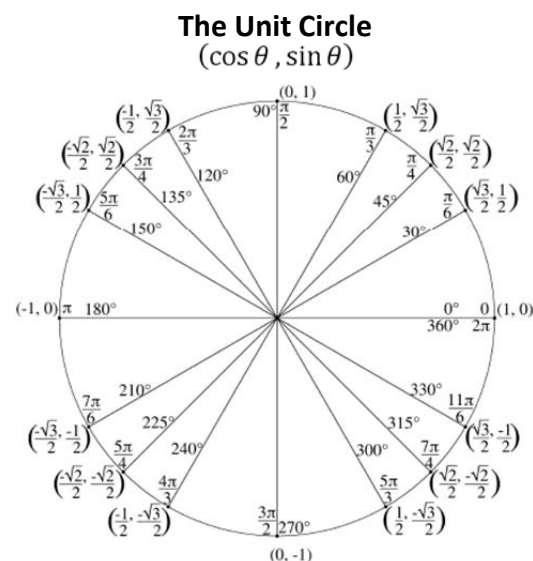
The graphs of sine and cosine look like _____. They are called _____.

$$f(\theta) = \cos \theta$$

θ	$f(\theta)$
0	
$\frac{\pi}{2}$	
π	
$\frac{3\pi}{2}$	
2π	

$$f(\theta) = \sin \theta$$

θ	$f(\theta)$
0	
$\frac{\pi}{2}$	
π	
$\frac{3\pi}{2}$	
2π	

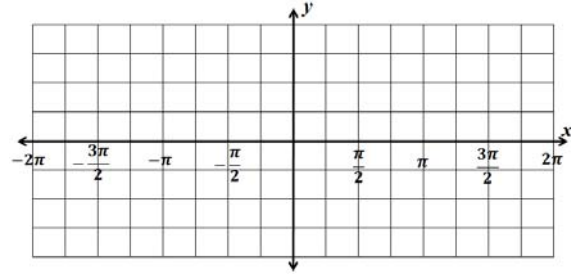
Standard equations: $f(\theta) = a \cos(b\theta)$ $f(\theta) = a \sin(b\theta)$ **Amplitude** = The maximum displacement or distance moved by a point on a vibrating body or wave measured from its equilibrium position.**Period** (cycle) = The change in θ values required for the function to complete one full cycle.**Frequency** = The reciprocal of period. The number of cycles the graph completes after one θ value.

10.1 Graphing Sine and Cosine

Write your questions and thoughts here!

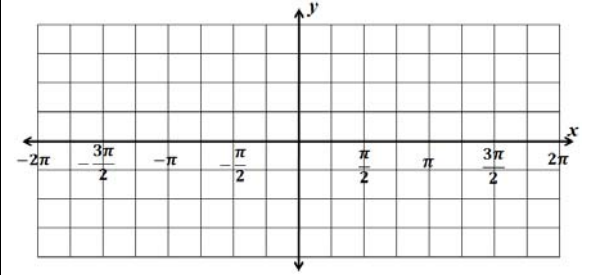
1. $f(\theta) = 3 \sin 2\theta$

Amp: Period: Freq:



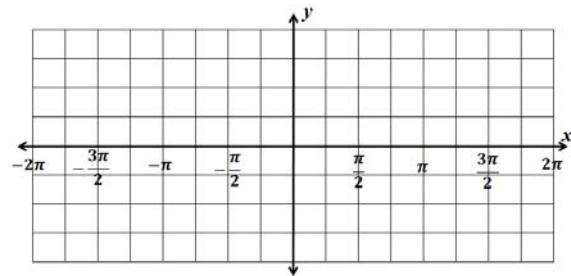
2. $g(\theta) = -2 \cos \frac{1}{2}\theta$

Amp: Period: Freq:



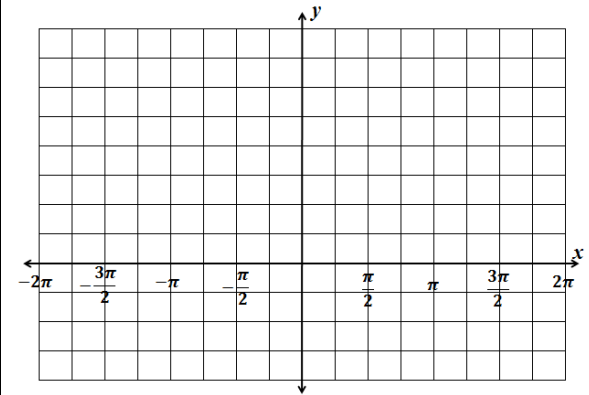
3. $y = 2 \sin \frac{1}{2}x + 1$

Amp: Period: Freq:



4. $y = 3 - 4 \cos 2x$

Amp: Period: Freq:

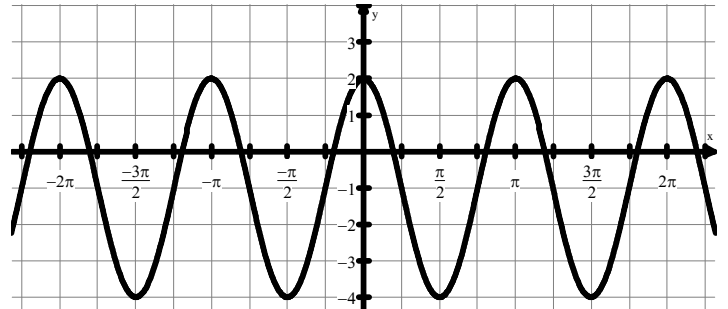


Use the given information to create a *sine* function.

5.
Amplitude: 5
Period: 4π
Vertical Shift: down 4

6.
Amplitude: 3
Period: $\frac{2}{3}$
Vertical Shift: up 1

7. Write a **cosine** function of the graph.



Now summarize what you learned!

10.1 Practice – Graphing Sine and Cosine

Name: _____

Pre-Calculus

For 1-3, identify the amplitude, period, frequency and vertical shift of each function.

1. $f(\theta) = 13 \sin 2\theta - 7$

Amp: _____ Period: _____

Freq: _____ Vert. Shift: _____

2. $g(t) = 5 - 6 \cos(\pi t)$

Amp: _____ Period: _____

Freq: _____ Vert. Shift: _____

3. $h(\theta) = -24 \sin(8\pi\theta)$

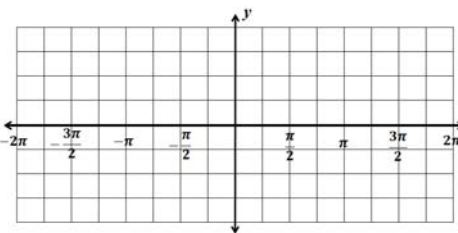
Amp: _____ Period: _____

Freq: _____ Vert. Shift: _____

For 4-15, identify the given information and graph the trig function.

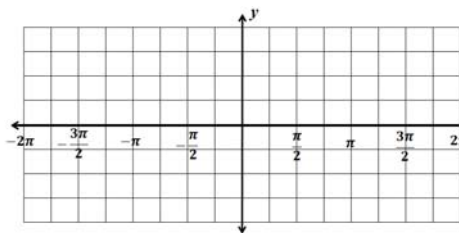
4. $f(\theta) = 3 \sin \theta$

Amp: _____ Period: _____ Freq: _____



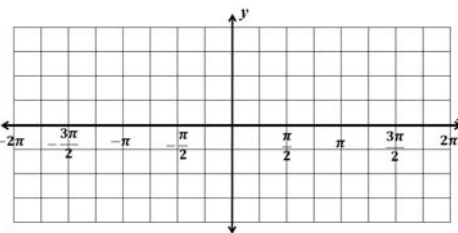
5. $y = -\sin 2x$

Amp: _____ Period: _____ Freq: _____



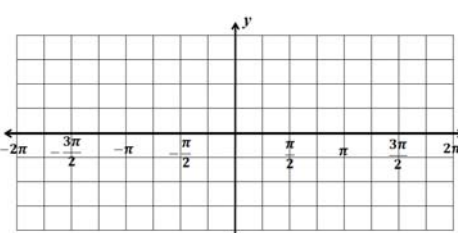
6. $f(\theta) = 4 \sin \frac{1}{2} \theta$

Amp: _____ Period: _____ Freq: _____



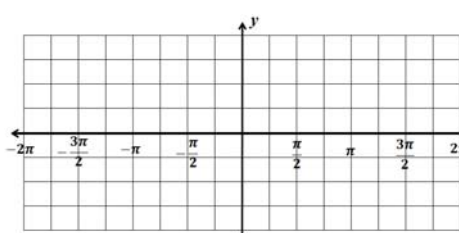
7. $y = 2 \cos x$

Amp: _____ Period: _____ Freq: _____



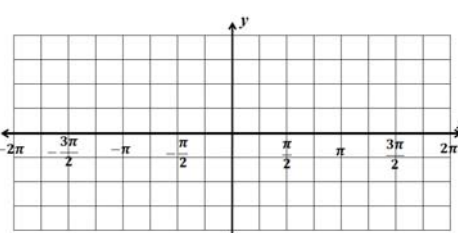
8. $f(\theta) = -3 \cos \frac{1}{2} \theta$

Amp: _____ Period: _____ Freq: _____



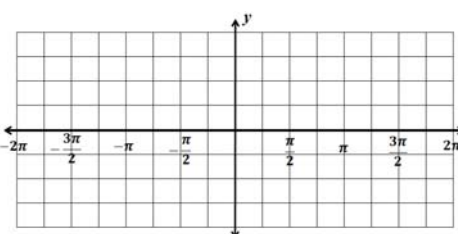
9. $y = -\cos 4x$

Amp: _____ Period: _____ Freq: _____



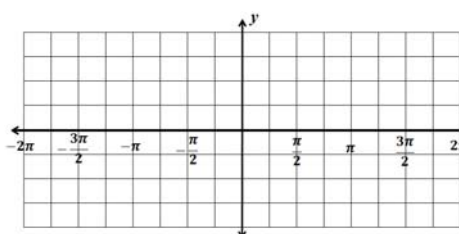
10. $f(\theta) = -4 \sin \theta$

Amp: _____ Period: _____ Freq: _____



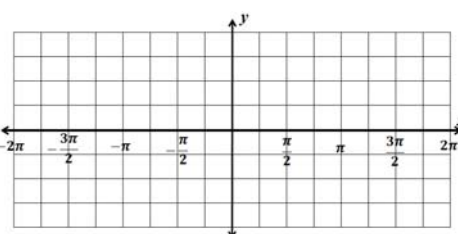
11. $y = -3 \cos 2x$

Amp: _____ Period: _____ Freq: _____



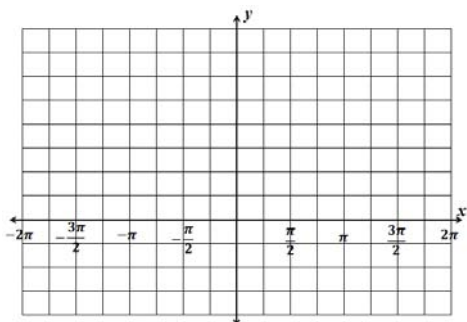
12. $y = 2 \sin \frac{4}{3} x$

Amp: _____ Period: _____ Freq: _____



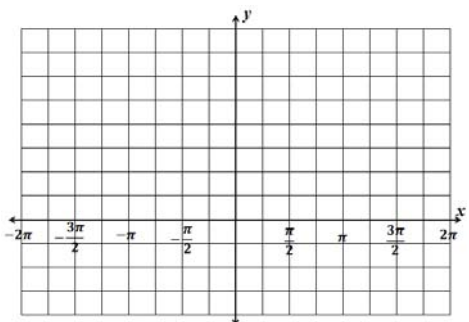
13. $f(\theta) = 3 \sin \theta - 1$

Amp: Period: Freq:



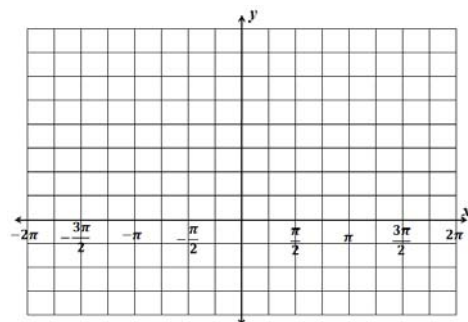
14. $f(t) = -\cos t + 2$

Amp: Period: Freq:



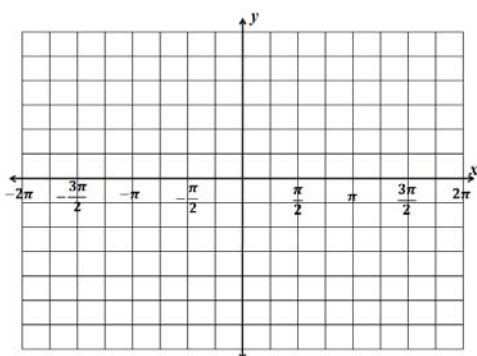
15. $y = 1 - \frac{3}{2} \cos x$

Amp: Period: Freq:



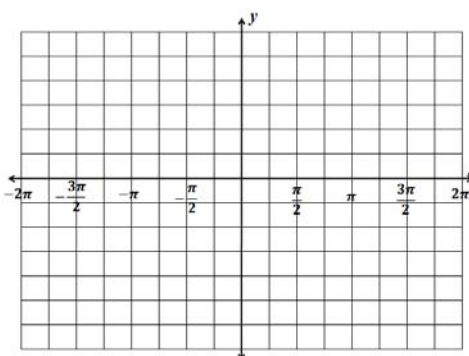
16. $y = -3 + 4 \sin \frac{2}{3} x$

Amp: Period: Freq:



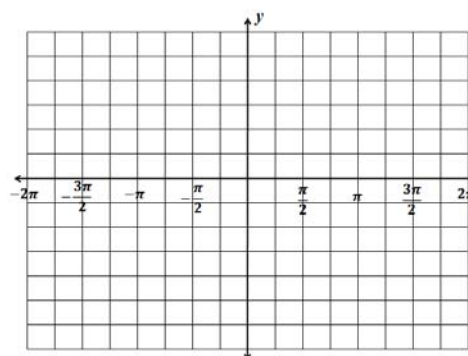
17. $f(\theta) = 2 - 3 \sin \frac{1}{2} \theta$

Amp: Period: Freq:



18. $f(t) = -2 \cos 2t + 4$

Amp: Period: Freq:



For 19 – 24, use the given information to create a sine function.

19.
Amplitude: 5
Period: 4π
Vertical Shift: down 4

20.
Amplitude: 2
Period: $\frac{3\pi}{5}$
Vertical Shift: up 9

21.
Amplitude: 1
Period: 4
Vertical Shift: up 1

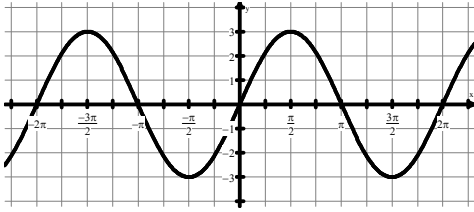
22.
Amplitude: 6
Period: 3π
Vertical Shift: down 5

23.
Amplitude: $\frac{1}{5}$
Period: $\frac{\pi}{10}$
Vertical Shift: up 15

24.
Amplitude: 10
Period: $\frac{5}{6}$
Vertical Shift: down 3

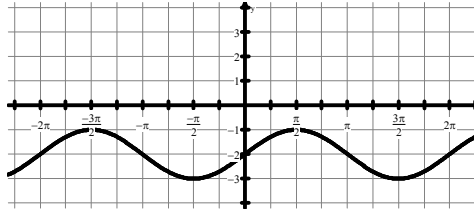
For 25-27, write the equation of the following sine curves.

25.



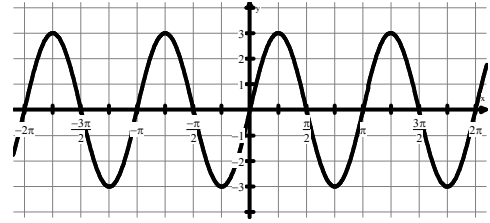
$y =$ _____

26.



$y =$ _____

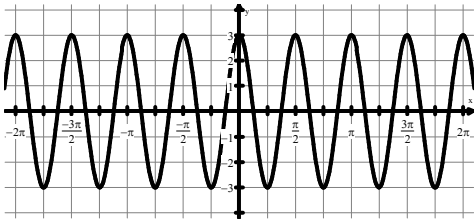
27.



$y =$ _____

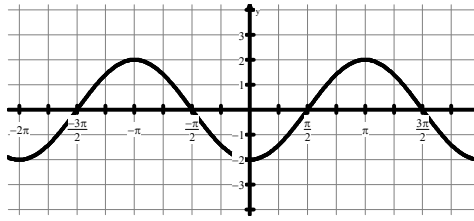
For 28-30, write the equation of the following cosine curves.

28.



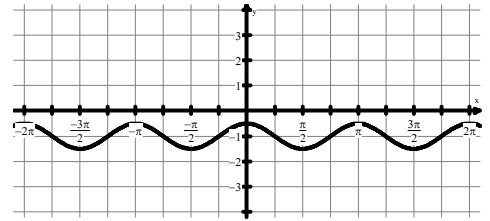
$y =$ _____

29.



$y =$ _____

30.



$y =$ _____

10.1 Application and Extension

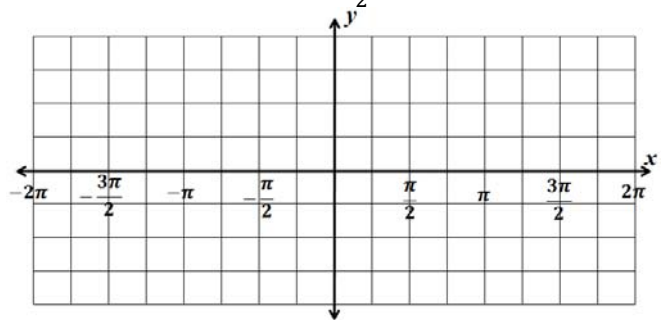
1. Create a **sine** function based off the following information:

Amplitude: 3

Period: $\frac{7}{2}\pi$

Vertical Shift: up 6

2. Graph $f(\theta) = 1 - 2 \sin \frac{1}{2} \theta$



3. The typical voltage V supplied by an electrical outlet in the U.S. oscillates between about -170 volts and $+170$ volts with a frequency of 60 cycles per second. Write a sine model that gives the number of volts V as a function of time t (in seconds).

4. Have you ever heard of a tuning fork? Mr. Brust thinks it's what he uses at dinner when he's listening to his favorite playlist. It's supposed to be used for creating a perfect pitch for a note. The note depends on the length and mass of the fork. The sound pressure wave one particular tuning fork produces can be modeled by

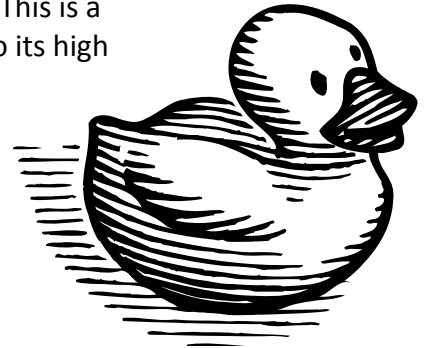
$$P(t) = 0.001 \sin(880t)$$

where P is the pressure (in pascals) and t is the time (in seconds). Find the period and frequency of this function.



5. One day at the beach, Sully brought his yellow rubber ducky to play in the ocean. He noticed that it bobbed up and down as the waves went past, and immediately thought, "This is a sinusoid situation...boom!" The ducky moves 4.2 feet from its low point to its high point, and then returns to its low point after a total of 8 seconds.

- a) Write an equation that gives the ducky's vertical position y at time t if the ducky is at its lowest point when $t = 0$.



- b) Explain why you chose $y = a \sin(bt)$ or $y = a \cos(bt)$ for part a.

Skillz Review: Multiply Monomial by Binomial (Distribute)		
$-2x(3x - 4)$	$\cos x (\cos x + 2)$	$3 \sin \theta (2 \sin \theta - \cos \theta)$
Skillz Review: Multiply Binomial by Binomial (FOIL)		
$(2x - 7)(3x + 1)$	$(\cos \theta - 2)(\cos \theta + 5)$	$(\sin \theta - \tan \theta)(\sin \theta + \tan \theta)$