

Pre-Calculus  
1.5 Graphs of Sine and Cosine Functions  
Assignment #44

Name Key  
Period \_\_\_\_\_ Group # \_\_\_\_\_

Determine the amplitude and period of each function.

1.  $y = \sin 4x$   
Amplitude = 1  
Period =  $\pi/2$

2.  $y = \cos 5x$   
Amplitude = 1  
Period =  $2\pi/5$

3.  $y = \sin x$   
Amplitude = 1  
Period =  $2\pi$

4.  $y = 4 \cos x$   
Amplitude = 4  
Period =  $2\pi$

5.  $y = -2 \sin x$   
Amplitude = 2  
Period =  $2\pi$

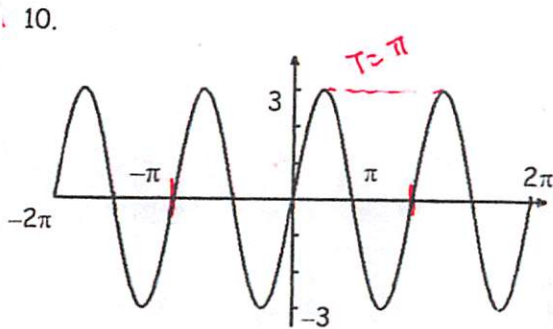
6.  $y = 2 \sin(-4x)$   
Amplitude = 2  
Period =  $\pi/2$

7.  $y = 3 \sin \frac{2}{3}x$   
Amplitude = 3  
Period =  $3\pi$

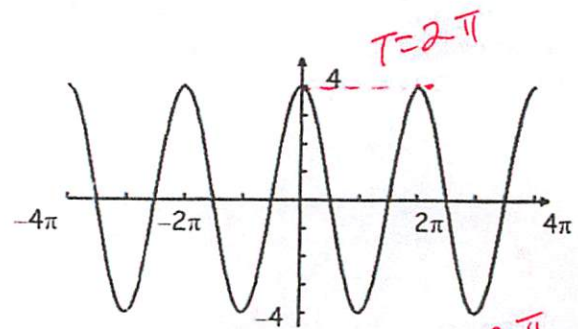
8.  $y = -4 \cos 5x$   
Amplitude = 4  
Period =  $2\pi/5$

9.  $y = 3 \cos(-2x)$   
Amplitude = 3  
Period =  $\pi$

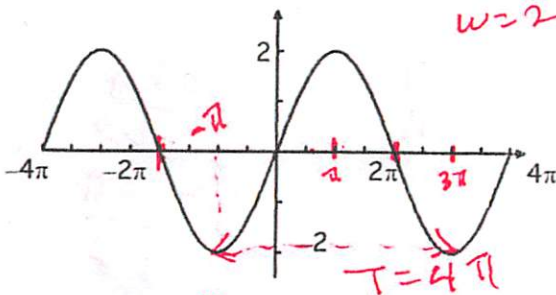
Give the amplitude and period of each function graphed below. Then write an equation of each graph.



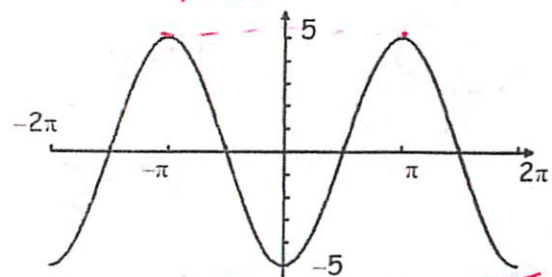
Amplitude = 3  
Period =  $\pi$   
Equation:  $y = 3 \sin(2x)$   
 $T = \frac{2\pi}{\omega}$   
 $\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{\pi}$   
 $\omega = 2$



Amplitude = 4  
Period =  $2\pi$   
Equation:  $y = 4 \cos x$   
 $T = \frac{2\pi}{\omega}$   
 $2\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{2\pi}$   
 $\omega = 1$



Amplitude = 2  
Period =  $4\pi$   
Equation:  $y = 2 \sin(\frac{1}{2}x)$   
 $T = \frac{2\pi}{\omega}$   
 $4\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{4\pi}$   
 $\omega = \frac{1}{2}$

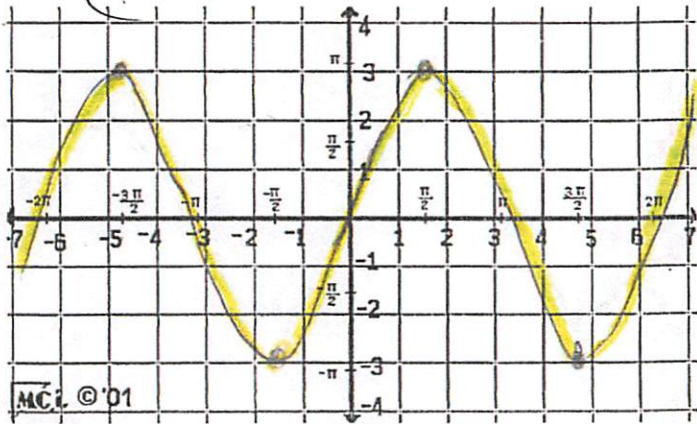


Amplitude = 5  
Period =  $2\pi$   
Equation:  $y = -5 \cos x$   
 $T = \frac{2\pi}{\omega}$   
 $2\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{2\pi}$   
 $\omega = 1$

Give the amplitude and period of each function. Then sketch the graph of the function over the interval  $-2\pi \leq x \leq 2\pi$  using the key points for each function.

14.

$y = 3 \sin x$

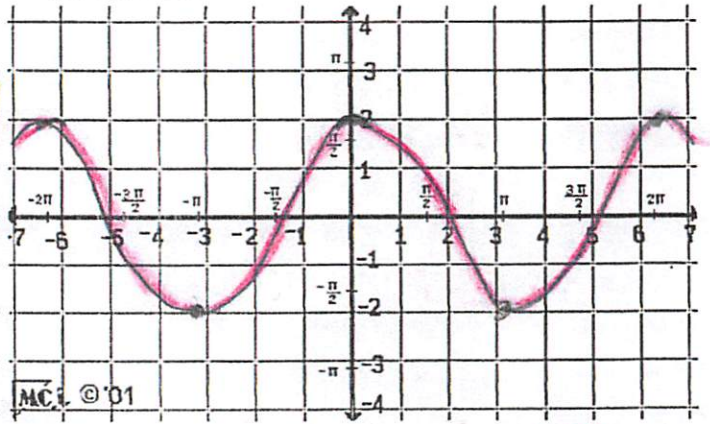


Amplitude = 3  
 Period =  $2\pi$   
 $\omega = 1$

$T = \frac{2\pi}{\omega}$   
 $2\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{2\pi}$   
 $\omega = 1$

15.

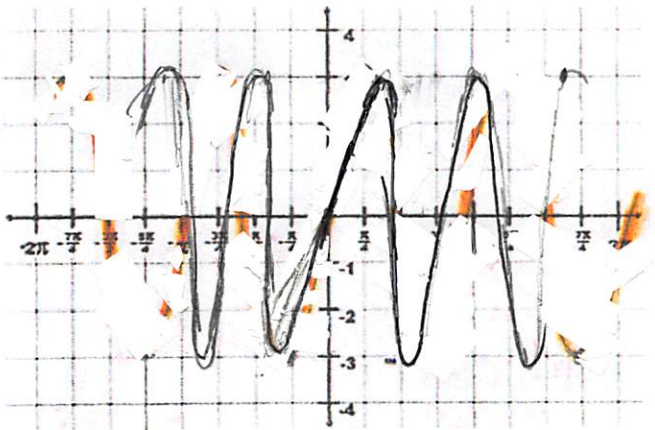
$y = 2 \cos x$



Amplitude = 2  
 Period =  $2\pi$   
 $\omega = 1$

$T = \frac{2\pi}{\omega}$   
 $2\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{2\pi}$   
 $\omega = 1$

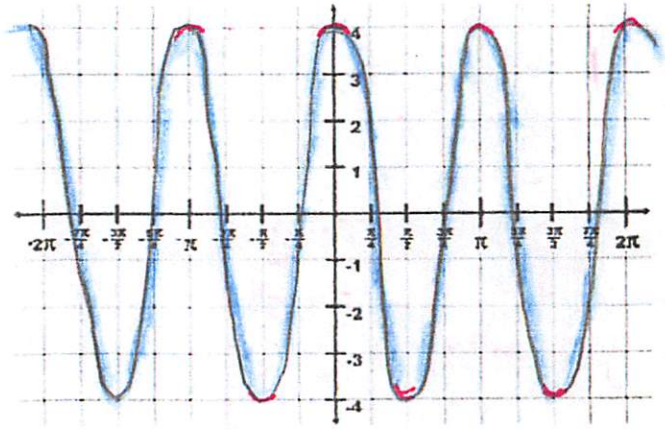
16.  $y = 3 \sin(3x)$



Amplitude = 3  
 Period =  $\frac{2\pi}{3}$   
 $\omega = 3$

$T = \frac{2\pi}{\omega}$   
 $\frac{2\pi}{3} = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{2\pi/3} \rightarrow 2\pi \cdot \frac{3}{2\pi} = 3$   
 $\omega = 3$

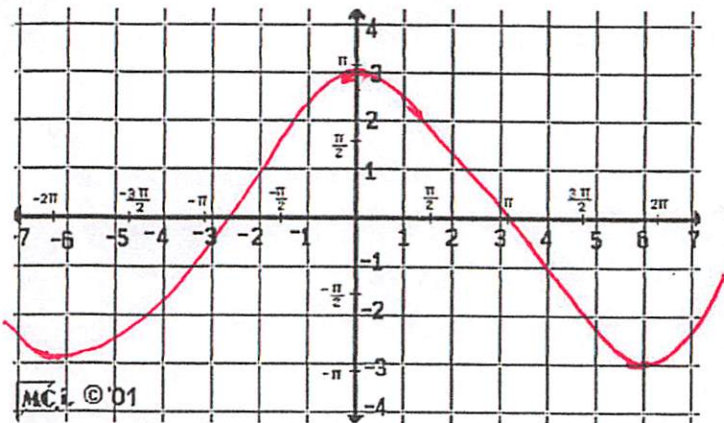
17.  $y = 4 \cos 2x$



Amplitude = 4  
 Period =  $\pi$   
 $\omega = 2$

$T = \frac{2\pi}{\omega}$   
 $\pi = \frac{2\pi}{\omega}$   
 $\omega = \frac{2\pi}{\pi}$   
 $\omega = 2$

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

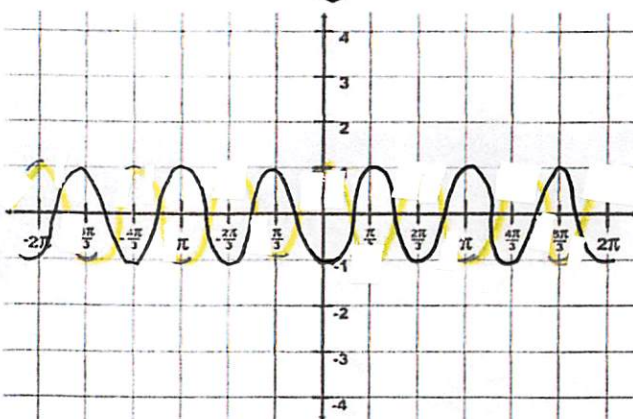


Amplitude = 3  
 Period = 4π

$T = \frac{2\pi}{\omega}$

19.

$y = -\cos(3x)$

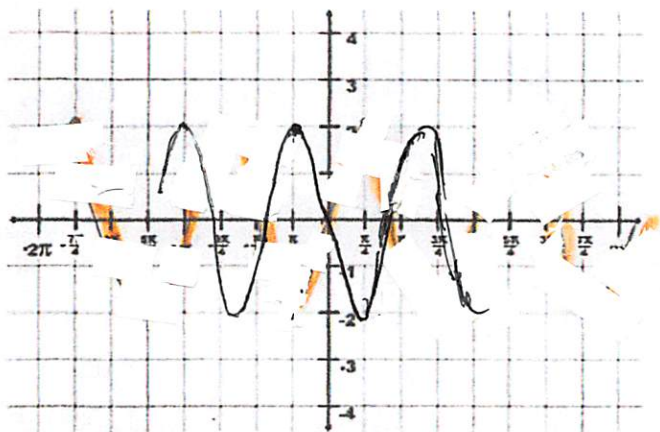


Amplitude = 1  
 Period = 2π/3

$T = \frac{2\pi}{\omega}$

20.

$y = -2 \sin(2x)$



Amplitude = 2  $\omega = 2$   
 Period = π

$T = \frac{2\pi}{\omega}$

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

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

21. Find an equation for a sine function that has amplitude of 4, a period of π.

$y = \pm 4 \sin(2x)$

$A = \pm 4$

$T = \frac{2\pi}{\omega}$

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

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

22. Find an equation for a cosine function that has an amplitude of  $\frac{3}{5}$ , a period of  $\frac{3}{2}\pi$ .

$y = \pm \frac{3}{5} \cos\left(\frac{4}{3}x\right)$

$|A| = \frac{3}{5} \rightarrow A = \pm \frac{3}{5}$

$T = \frac{2\pi}{\omega}$

$\frac{3\pi}{2} = \frac{2\pi}{\omega}$

$\omega = \frac{2\pi}{\frac{3\pi}{2}} = \frac{4}{3}$

23. Find an equation for a sine function that has amplitude of 5, a period of 3π.

$y = \pm 5 \sin\left(\frac{2}{3}x\right)$

$A = \pm 5$

$T = \frac{2\pi}{\omega}$   
 $3\pi = \frac{2\pi}{\omega}$

$\omega = \frac{2\pi}{3\pi} = \frac{2}{3}$

# HOW OFTEN DID THE STUDENT WHO GOT "C" ON HIS TRIG FUNCTIONS TEST DO HIS HOMEWORK?

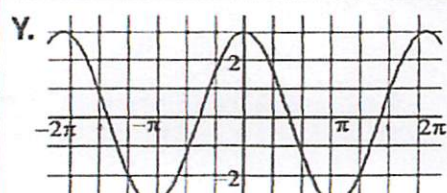
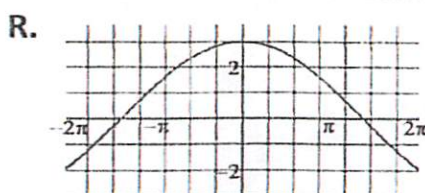
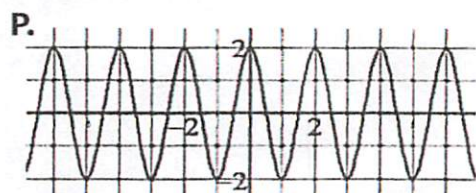
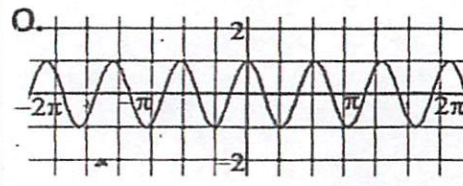
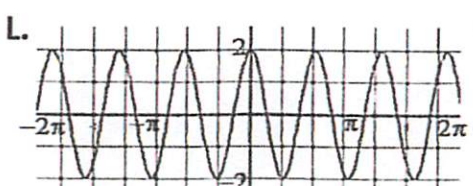
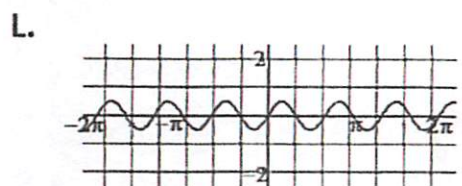
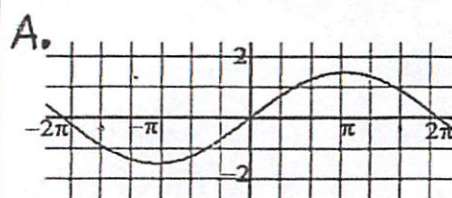
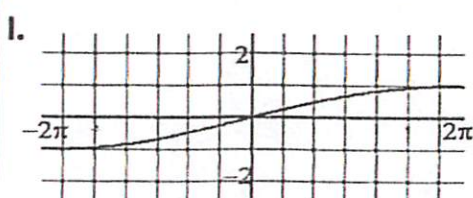
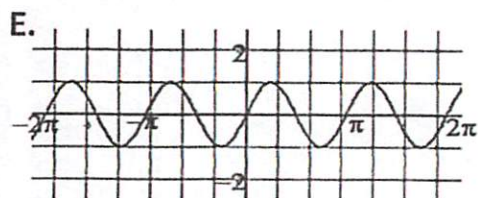
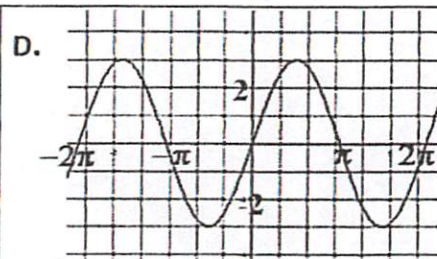
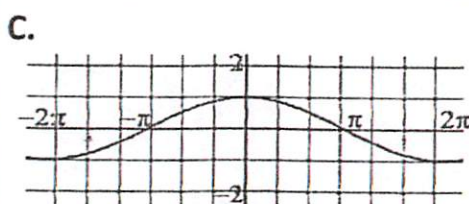
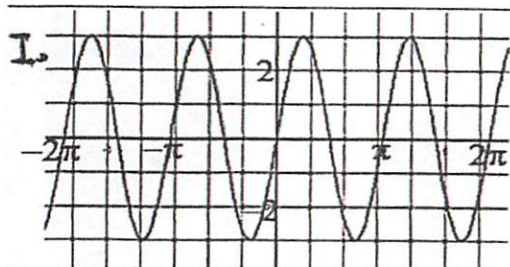
$$f(x) = A\sin(Bx) \quad f(x) = A\cos(Bx)$$

$|A|$  = Amplitude

B represents the number of complete waves in an interval of  $2\pi$ , therefore  $\frac{2\pi}{B}$  = Period

1) $f(x) = 3\sin x$	2) $f(x) = \sin(2x)$	3) $f(x) = \sin\frac{x}{4}$	4) $f(x) = \cos\left(\frac{1}{2}x\right)$
5) $f(x) = \cos(3x)$	6) $f(x) = \frac{1}{2}\sin(3x)$	9) $f(x) = \frac{3}{2}\sin\left(\frac{1}{2}x\right)$	10) $f(x) = 2\cos(\pi x)$
7) $f(x) = 3\sin(2x)$	8) $f(x) = 3\cos x$	11) $f(x) = 3\sin\frac{x}{3}$	12) $f(x) = 2\cos(3x)$

Match each function from above with a graph below.



P E R I O D I C A L L Y  
10 2 11 3 5 1 7 4 9 12 6 118