

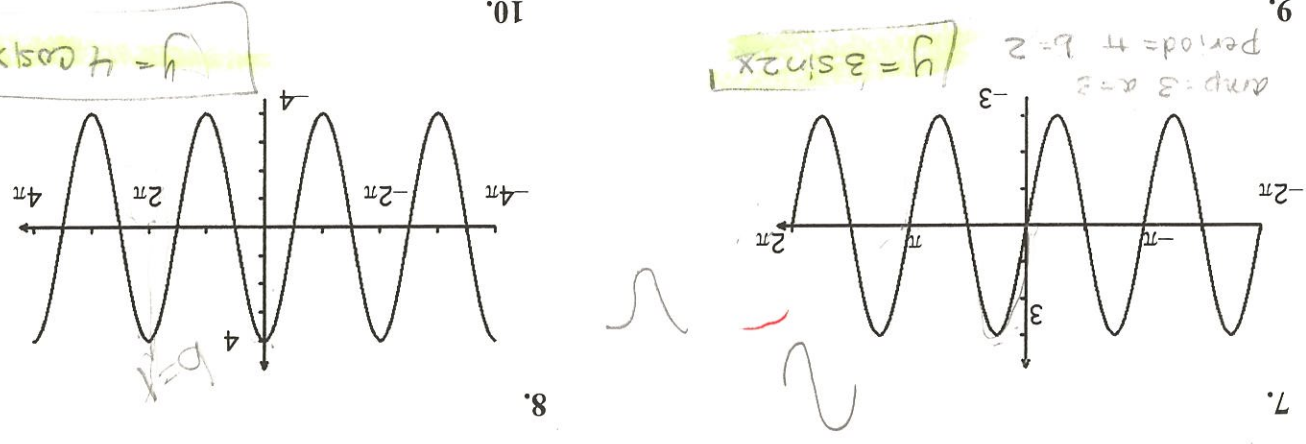
Bowser

(WS #1)

Determine the amplitude and period of each function. (Write Period in both Radian and Degree)

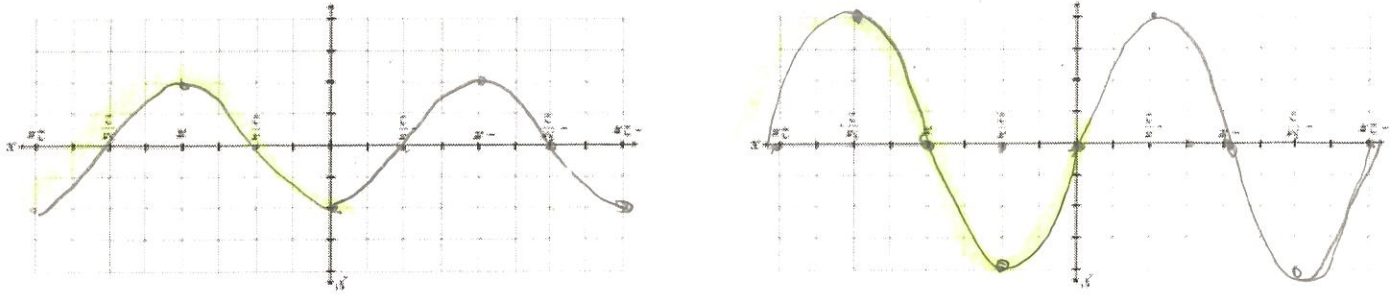
1. $y = \sin 4x$
amp = 1
 $b = 4$ period = $2\pi = 360^\circ$
2. $y = \cos 5x$
amp = 1
 $b = 5$ period = $2\pi = 360^\circ$
3. $y = 2 \sin x$
amp = 2
 $b = 1$ period = $2\pi = 360^\circ$
4. $y = -4 \sin 3x$
 $a = -4$ amp = 4
 $b = 3$ period = $2\pi = 120^\circ$
5. $y = 2 \sin(-4x)$
amp = 2
 $b = 4$ period = $2\pi = 90^\circ$
6. $y = 3 \sin \frac{3}{2}x$
amp = 3
 $b = \frac{3}{2}$ period = $2\pi \cdot \frac{2}{3} = 4\pi = 720^\circ$

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

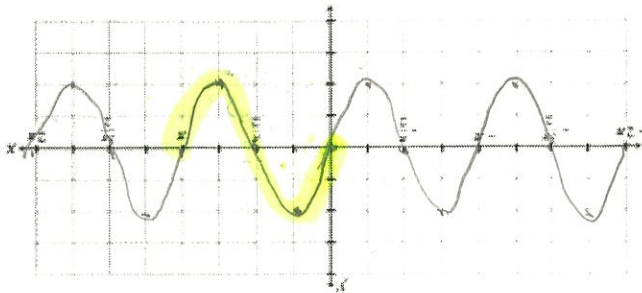


Sketch the graph of the function over the interval $-2\pi \leq x \leq 2\pi$.

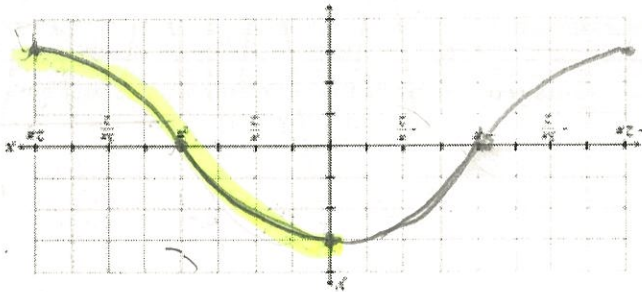
11. $y = 4 \sin x$
amp = 4
 $b = 1$ period = 2π
12. $y = 2 \cos x$
amp = 2
period = 2π



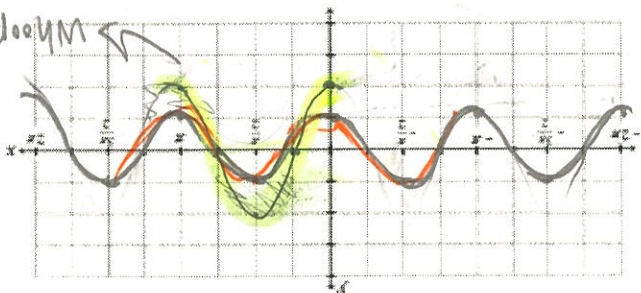
13. $y = 2 \sin 2x$
 amp = 2
 $b = 2$ cycles
 period = $2\pi = \pi$



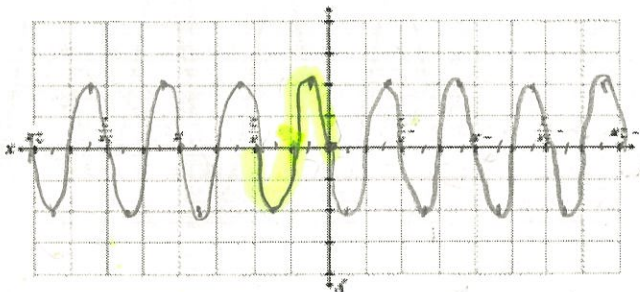
15. $y = 3 \cos \frac{1}{2} x$
 $b = \frac{1}{2}$ cycles
 period = $2\pi = 4\pi$



14. $y = -\cos 2x$
 amp = 1
 $b = 2$ cycles
 period = $2\pi = \pi$



16. $y = -2 \sin(4x)$
 period = $\frac{2\pi}{4} = \frac{\pi}{2}$
 $b = 4$ cycles



Determine the amplitude, period, phase shift, and vertical shift for each.

17. $y = 2 + 3 \sin\left(4x + \frac{\pi}{2}\right) + 2$
 $a = 3$ amplitude
 $b = 4$ period = $\frac{2\pi}{4} = \frac{\pi}{2}$
 $c = -\frac{\pi}{8}$ phase shift = left $\frac{\pi}{8}$
 $d = 2$ midline = 2

18. $y = 2 \cos(x - \pi)$
 $a = 2$ amplitude
 $b = 1$ period = 2π
 $c = \pi$ phase shift
 $d = 0$

19. $y = \frac{1}{2} \cos 2x - 4$
 $a = \frac{1}{2}$
 $b = 2$ period = π

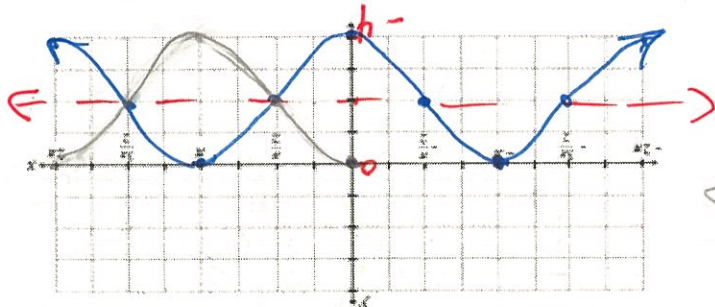
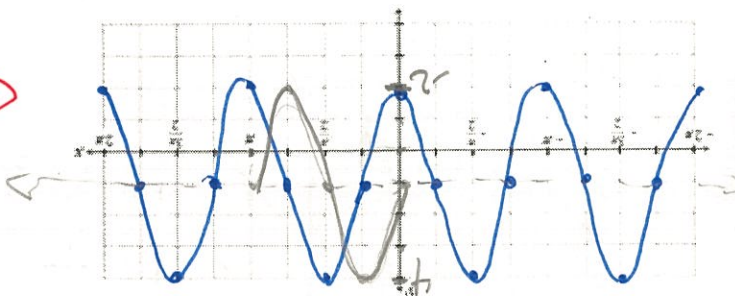
20. $y = 3 + 4 \sin(x - \pi)$
 $a = 4$ amp
 $b = 1$, period = 2π
 $c = \pi$ phase shift = right π
 $d = 3$ midline

21. $y = 1 + 3 \sin\left(2x - \frac{\pi}{2}\right)$
 $b = 2$ period = π
 $c = \frac{\pi}{2}$ phase shift = right $\frac{\pi}{2}$
 $d = 1$ midline

Sketch the graph of each function for ONE PERIOD.

22. $y = 2 \cos(x + \pi) - 2$
 $b = 1$ period = 2π
 $c = \pi$ (left)
 $d = -2$ midline = -2

23. $y = 1 + 3 \sin 2\left(x - \frac{\pi}{4}\right)$
 $b = 2$ period = π
 $c = \frac{\pi}{4}$ phase shift = right $\frac{\pi}{4}$
 $d = 1$ midline



WS #2

Name _____

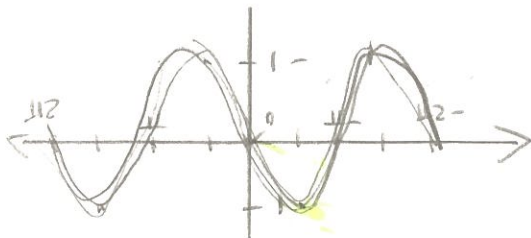
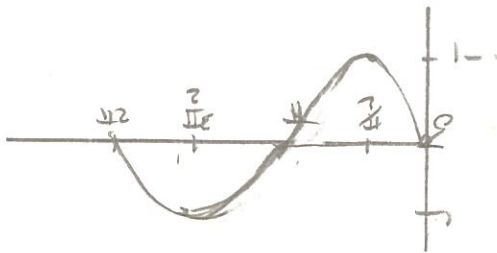
Hour _____

Date _____

Find the period and amplitude of each function. Then sketch a complete cycle of the graph starting from 0.

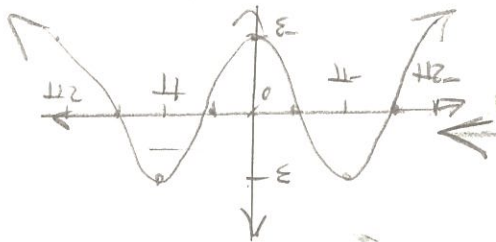
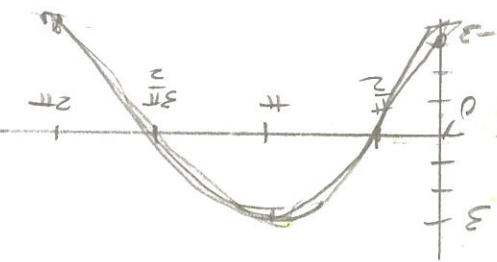
1. $y = -\sin x$

Amplitude = 1
 Period = 2π



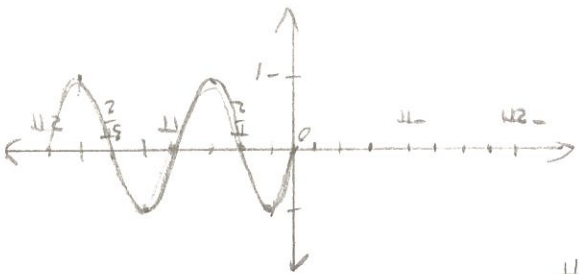
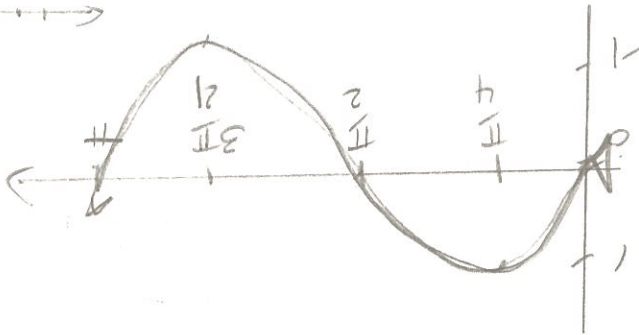
2. $y = -3 \cos x$

Amplitude = 3
 Period = 2π
 $b = 1$



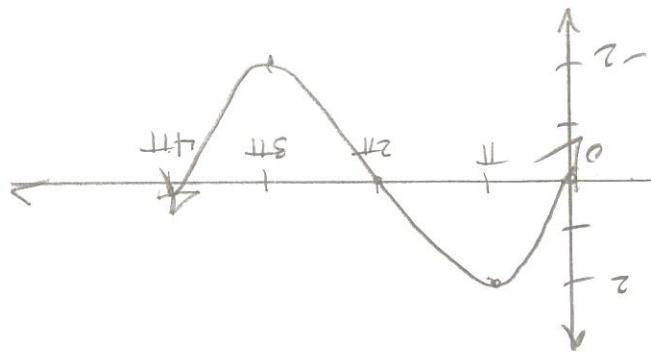
3. $y = \sin 2\theta$

Amplitude = 1
 Period = $\frac{2\pi}{2} = \pi$
 $b = 2$ cycles



4. $y = 2 \sin \frac{\theta}{2}$

Amplitude = 2
 Period = $\frac{2\pi}{1/2} = 4\pi$
 $b = \frac{1}{2}$ cycle

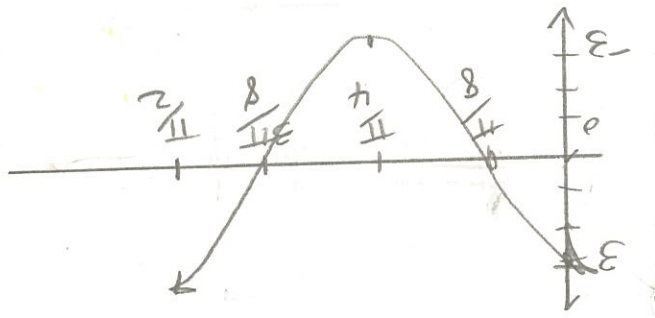


5. $y = 3 \cos 4\theta$

Amplitude = $\frac{3}{3}$

Period = $\frac{2\pi}{4} = \frac{\pi}{2}$

$b = 4$ cycles in 2π

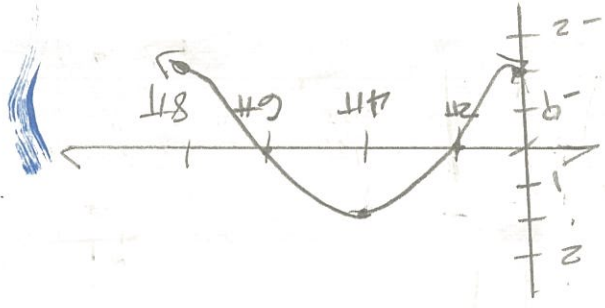


6. $y = -\frac{2}{3} \cos \frac{1}{4} x$

Amplitude = $\frac{-3/2}{-3/2} = \frac{3}{2}$

Period = $\frac{2\pi(1/4)}{1/4} = 8\pi$

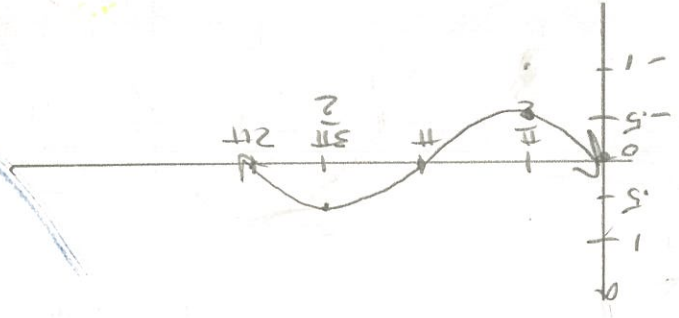
$b = \frac{1}{4}$



7. $y = -5 \sin \theta$

Amplitude = $\frac{0.5}{0.5} = 1$

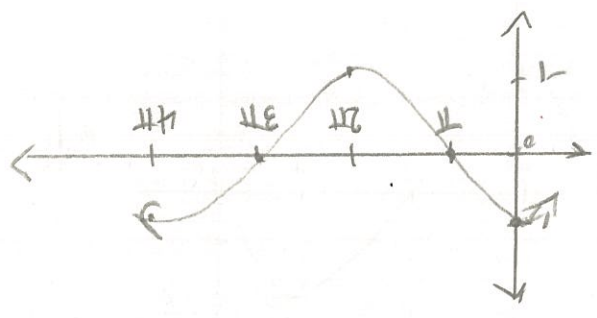
Period = $\frac{2\pi}{1} = 2\pi$



8. $y = \cos \frac{x}{2}$

Amplitude = $\frac{1}{1} = 1$

Period = $\frac{2\pi}{1/2} = 4\pi$



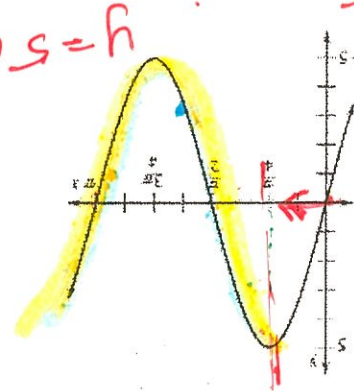
4.5 Worksheet #2-Writing Equations of Sine and Cosine Functions

Name _____

(MS #3)

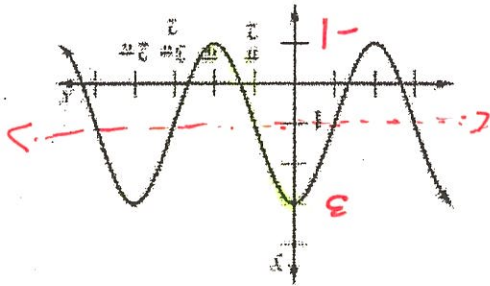
Precalculus Homework

Examine the graph below and determine the amplitude, period, phase shift, and vertical shift of each using COSINE as the parent function. Then write an equation of the function.



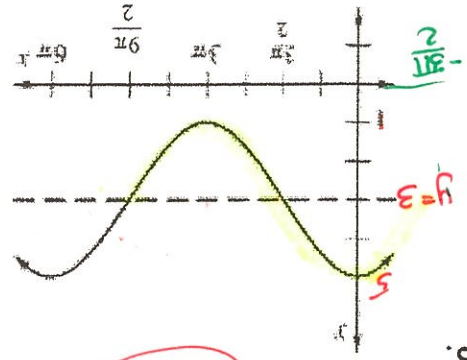
$a=5$
 $b=2$
 $a=\pi/4$
 $d=0$
 $y=5\cos 2(x-\pi/4)$

Function: ~~$y=5\cos(x-\pi/4)$~~
 Vertical Shift: ~~0~~
 Phase Shift: ~~0~~ $\pi/4$
 Period: ~~2π~~ π
 Amplitude: ~~5~~ $a=5$



Function: $y=2\cos(x+1)$
 Vertical Shift: $d=1$
 Phase Shift: $a=0$
 Period: 2π $b=1$
 Amplitude: $a=2$

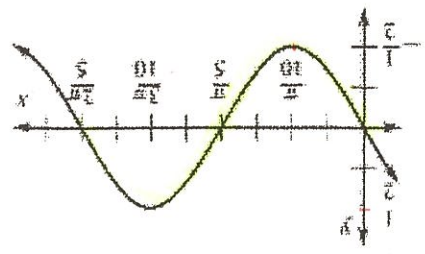
Examine the graph below and determine the amplitude, period, phase shift, and vertical shift of each using SINE as the parent function. Then write an equation of the function.



Function: ~~$y=2\cos(x+3)$~~
 Vertical Shift: $d=3$
 Phase Shift: ~~0~~
 Period: 6π $b=3$
 Amplitude: $a=2$

$-3\pi/2$

$y=2\sin(x+\frac{3\pi}{2})+3$



Function: $y=-\frac{1}{2}\sin 5x$
 Vertical Shift: $d=0$
 Phase Shift: $a=0$
 Period: $\frac{5}{2\pi}$ $b=5$
 Amplitude: $\frac{1}{2}$ $a=-\frac{1}{2}$

$b=5$
 $\frac{b}{2\pi}=\frac{5}{2\pi}$

Identify the amplitude, period, phase shift and vertical shift of the following trig functions.

<p>5. $y = -10 \cos\left(\frac{6}{x}\right) = -10 \cos\left(\frac{1}{6}x\right)$</p> <p>Amplitude: 10 $a = -10$ Period: $b = \frac{1}{6}$ period = $\frac{2\pi}{\frac{1}{6}} = 12\pi$ Phase Shift: 0 $c = 0$ Vertical Shift: 0 $d = 0$</p>	<p>6. $y = 5 - 2 \sin\left(\frac{2x}{3}\right) = -2 \sin\frac{2}{3}x + 5$</p> <p>Amplitude: 2 $a = -2$ Period: $b = \frac{2}{3}$ period = $2\pi / (\frac{2}{3}) = 3\pi$ Phase Shift: 0 Vertical Shift: 5</p>
<p>7. $y = 3 \cos\left(6x + \frac{\pi}{6}\right)$</p> <p>Amplitude: 3 Period: $\frac{2\pi}{6} = \frac{\pi}{3}$ Phase Shift: $-\frac{\pi}{6}$ (left) Vertical Shift: 0</p>	<p>8. $y = -4 \sin\left(\frac{2}{3}x - \frac{\pi}{3}\right) = -4 \sin\frac{2}{3}\left(x - \frac{\pi}{2}\right)$</p> <p>Amplitude: 4 $a = -4$ Period: $b = \frac{2}{3}$ period = $\frac{2\pi}{\frac{2}{3}} = 3\pi$ Phase Shift: $-\frac{\pi}{2}$ (left) Vertical Shift: 0</p>

Given the following information about each trig function, write a possible equation for each.

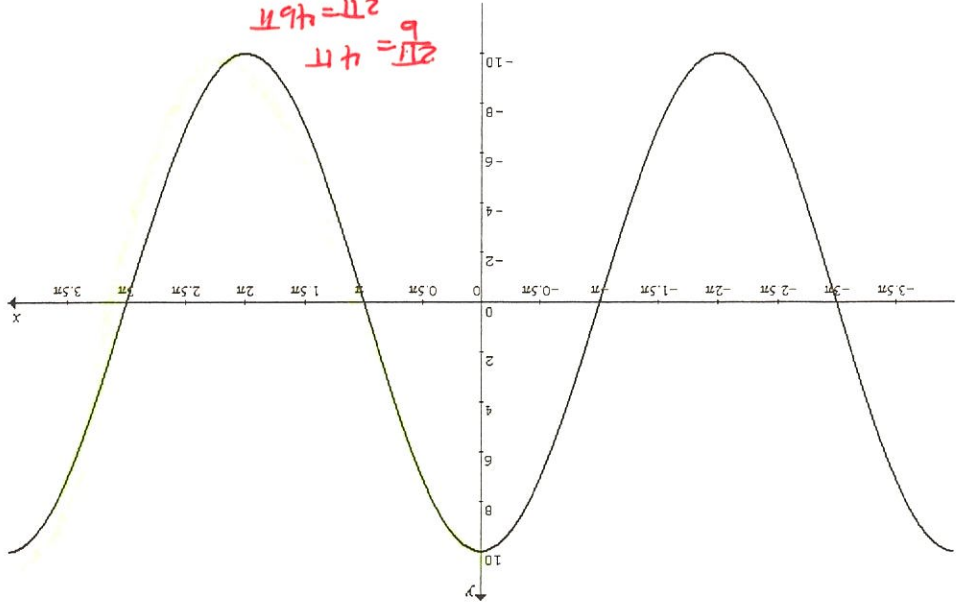
<p>9. Sine Function</p> <p>amplitude = $\frac{1}{2}$ period = $\frac{\pi}{3}$ vertical shift = -4</p> <p>$y = \frac{1}{2} \sin 6x - 4$</p>	<p>10. Sine Function</p> <p>amplitude = 7 period = 4π phase shift = $-\frac{\pi}{3}$</p> <p>$y = 7 \sin\frac{1}{2}\left(x + \frac{\pi}{3}\right)$</p>
<p>11. Cosine Function</p> <p>amplitude = 1 period = 2π phase shift = $\frac{5\pi}{6}$ vertical shift = 3</p> <p>$y = \cos\left(x - \frac{5\pi}{6}\right) + 3$</p>	<p>12. Cosine Function</p> <p>amplitude = 3 period = π phase shift = $-\pi$ vertical shift = -1.5</p> <p>$y = 3 \cos 2(x + \pi) - 1.5$</p>

<p>11. Cosine Function</p> <p>amplitude = 1 period = 2π phase shift = $\frac{5\pi}{6}$ vertical shift = 3</p> <p>$y = \cos\left(x - \frac{5\pi}{6}\right) + 3$</p>	<p>12. Cosine Function</p> <p>amplitude = 3 period = π phase shift = $-\pi$ vertical shift = -1.5</p> <p>$y = 3 \cos 2(x + \pi) - 1.5$</p>
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WS 7/4

Trig Graphs Worksheet

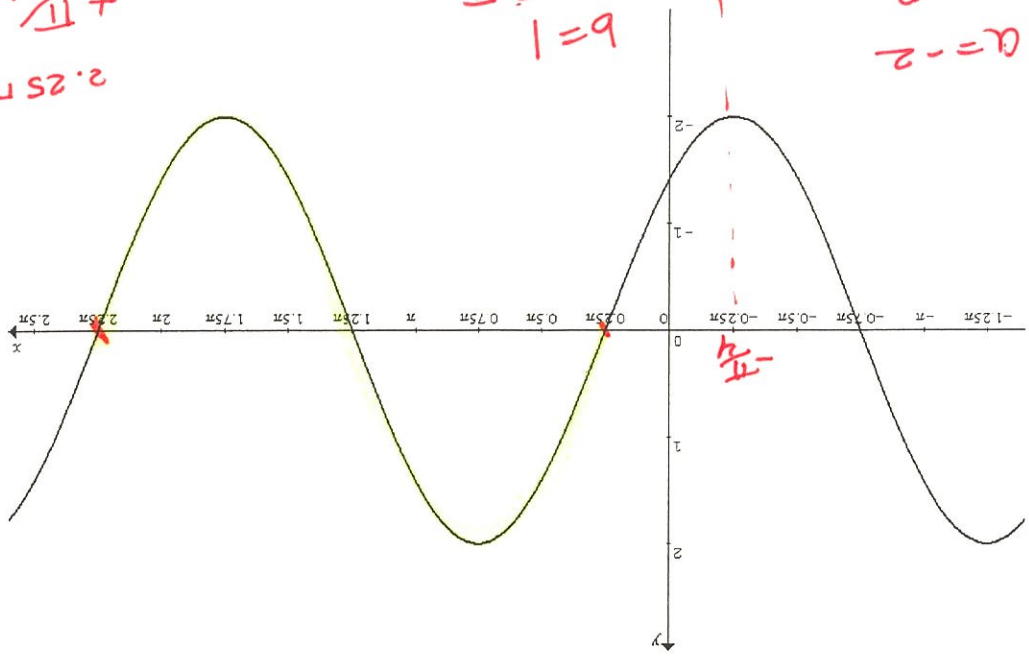
State the equations for the following graphs.



Amplitude = 10
Period = 4π
Phase Shift = 0

Equation (1) = $y = 10 \cos \frac{1}{2} x$

(in terms of the cosine function)



Amplitude = 2
Period = 2π

Equation (2) = $y = 2 \sin \left(x - \frac{\pi}{4} \right)$

(in terms of the sine function)

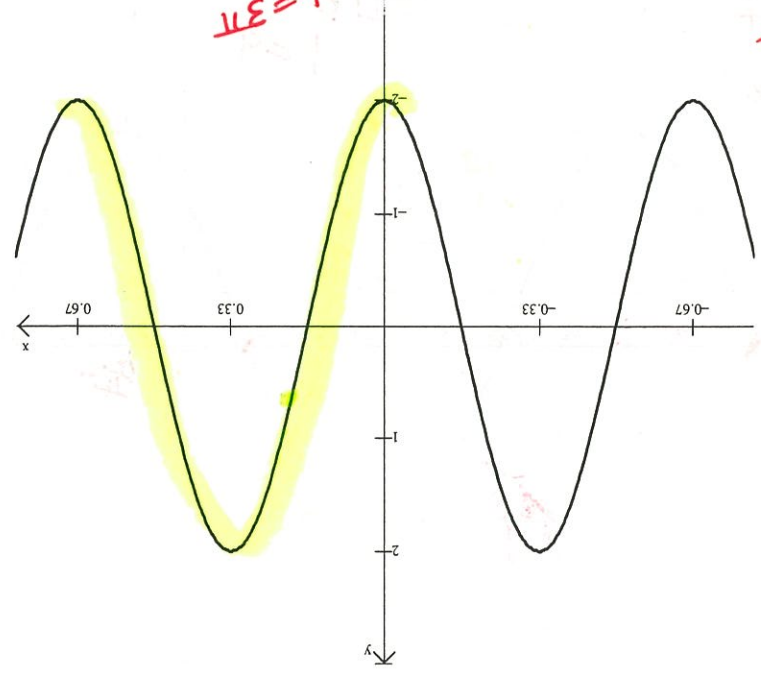
Phase Shift = $+\frac{\pi}{4}$

$2.25\pi - 0.25\pi = 2\pi$

Equation (4) = $y = -2 \cos 3\pi x$ (in terms of the cosine function)

Amplitude = 2 Period = $\frac{2}{3}$ Phase Shift = 0

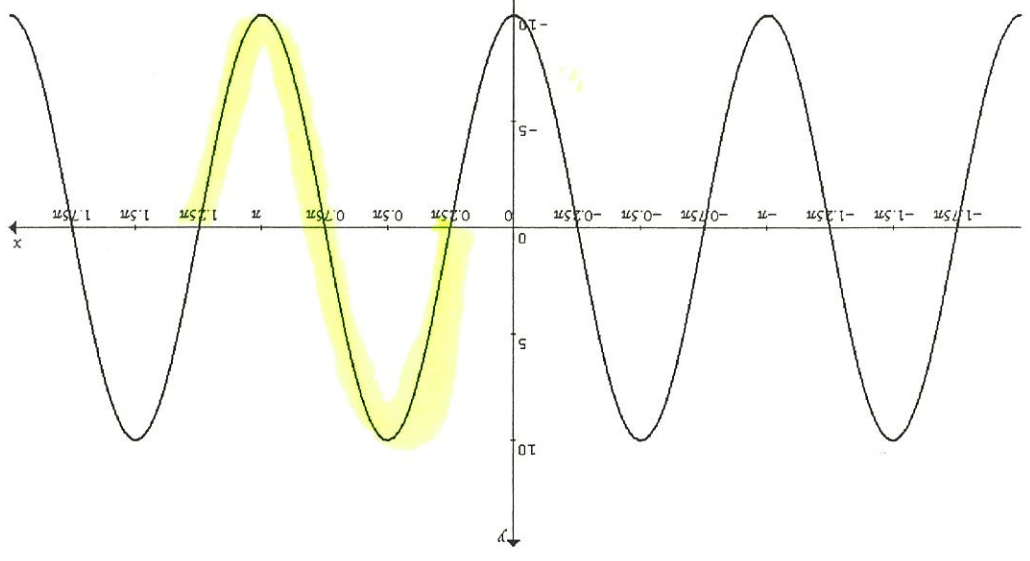
$a = -2$
 $b = 3\pi$
 $\frac{2\pi}{b} = \frac{2}{3}$
 $2b = 6\pi$
 $b = (3\pi)$



Equation (3) = $y = 10 \sin(x + \frac{\pi}{4})$ (in terms of the sine function)

Amplitude = 10 Period = π Phase Shift = $+\frac{\pi}{4}$

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

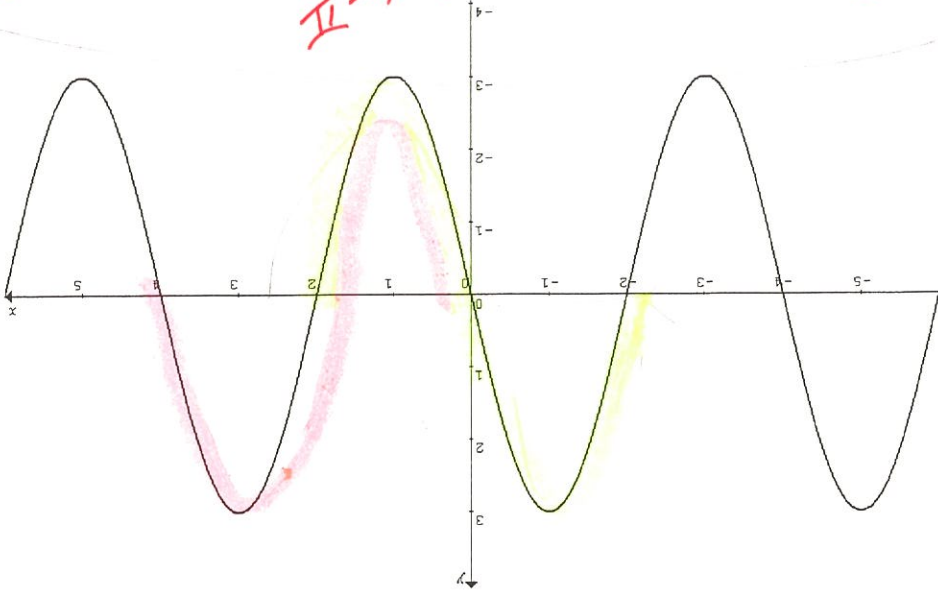


$$y = 3 \sin \frac{\pi}{2} x$$

Equation (6) = ~~$y = 3 \sin \frac{\pi}{2} x$~~ (in terms of the sine function)

Amplitude = 3 Period = 4 Phase Shift = ~~$-\pi/2$~~ 0

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



$$y = 3 \cos \frac{\pi}{2} x - 4$$

Equation (5) = $y = 3 \cos \frac{\pi}{2} x - 4$ (in terms of the cosine function)

Amplitude = 3 Period = 4 Phase Shift = \emptyset

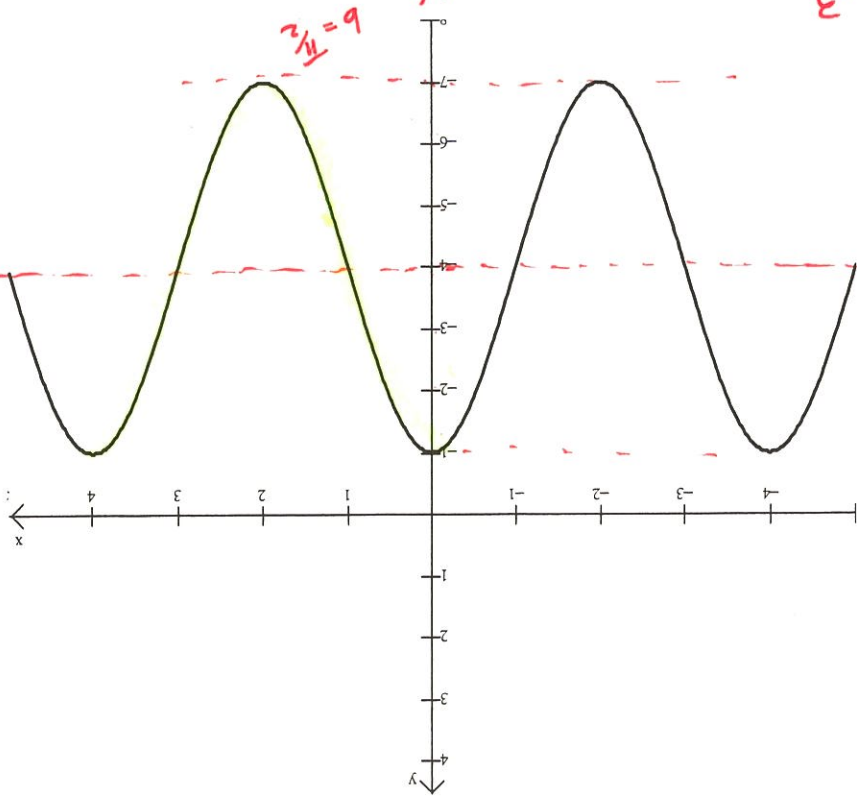
$$b = \frac{\pi}{2}$$

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

$$4b = 2\pi$$

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

$$y = -4$$



Graph one complete period of the given sine or cosine curve. (Check your answer with your graphing calculator!)

$$y = \sin x - 2$$

$$f(x) = -2 + \sin x$$

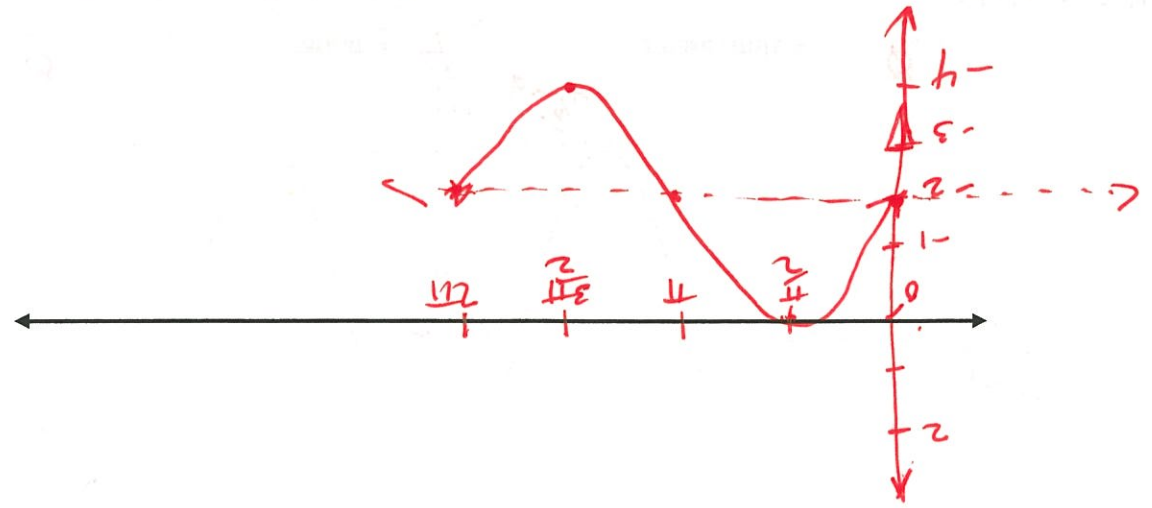
Period = 2π

$b = 1$

Phase Shift = $c = 0$

midline = -2

Amplitude = 2



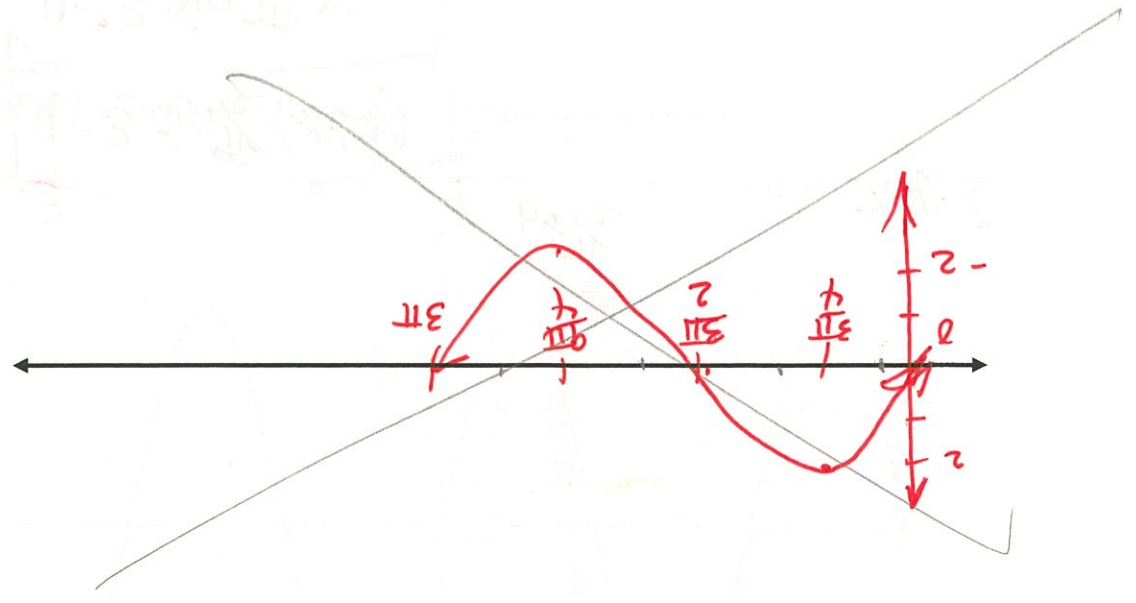
$$y = 2 \sin \left(\frac{3}{2}x - \frac{\pi}{4} \right)$$

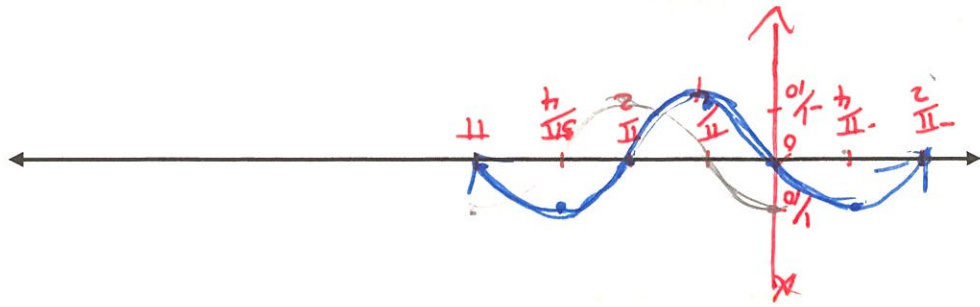
$$f(x) = 2 \sin \left(\frac{3}{2}x - \frac{\pi}{4} \right)$$

Period = $\frac{2\pi}{3/2} = \frac{4\pi}{3}$

Phase Shift = $\frac{\pi}{4}$

Amplitude = 2



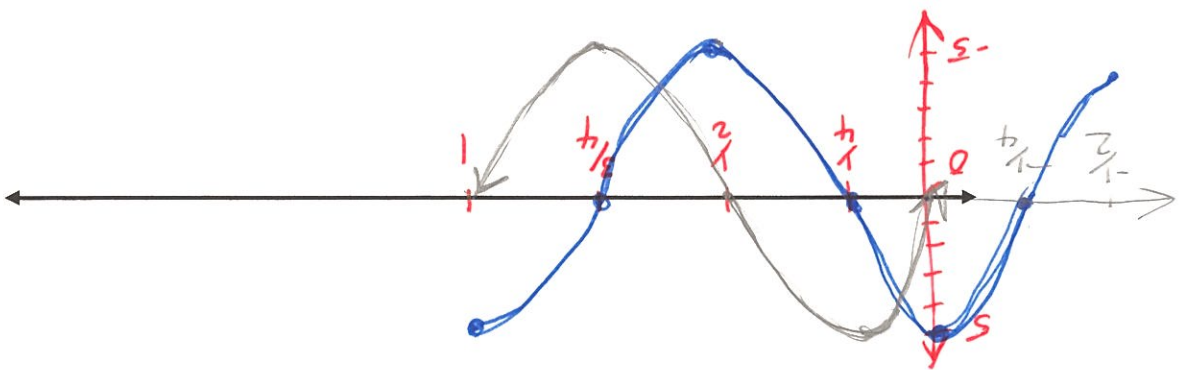


Amplitude = $\frac{1}{10}$

Period = 2 $b=2$

Phase Shift = $-\frac{\pi}{4}$

$$f(x) = \frac{1}{10} \cos 2 \left(x + \frac{\pi}{4} \right)$$



Amplitude = 5 $a=5$

Period = 1 $b=2\pi$

Phase Shift = $-\frac{1}{4}$

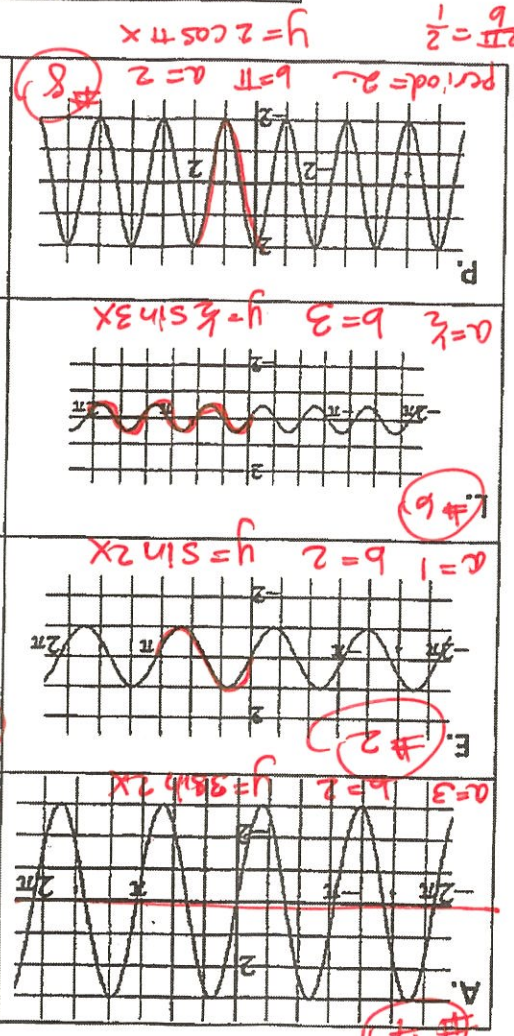
$$f(x) = 5 \sin \left(2\pi x + \frac{\pi}{2} \right)$$

$$5 \sin 2\pi \left(x + \frac{1}{4} \right)$$



P E R I O D A C I L Y
8 2 11 3 5 1 7 4 9 12 6 10

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



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

Match each function from above with the graph below.
Write the amplitude, # of cycles in 2π , period and the equation next to each graph.

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

WS 103



Name _____
Period _____
Group # _____

Determine the amplitude and period of each function.

1. $y = \sin 4x$
Amplitude = $\frac{1}{1}$
Period = $\frac{2\pi}{4} = \frac{\pi}{2}$
4. $y = 4 \cos x$
Amplitude = $\frac{4}{1}$
Period = $\frac{2\pi}{1}$
7. $y = 3 \sin \frac{3}{2}x$
Amplitude = $\frac{3}{1}$
Period = $\frac{2\pi}{\frac{3}{2}} = \frac{4\pi}{3}$
1. $y = \cos 5x$
Amplitude = $\frac{1}{1}$
Period = $\frac{2\pi}{5}$
2. $y = -2 \sin x$
Amplitude = $\frac{2}{1}$ ($a = -2$)
Period = $\frac{2\pi}{1}$
5. $y = -4 \cos 5x$
Amplitude = $\frac{4}{1}$ ($a = -4$)
Period = $\frac{2\pi}{5}$
6. $y = 2 \sin (-4x)$
Amplitude = $\frac{2}{1}$
Period = $\frac{2\pi}{4} = \frac{\pi}{2}$
9. $y = 3 \cos (-2x)$
Amplitude = $\frac{3}{1}$
Period = $\frac{2\pi}{2} = \pi$

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

10.

Amplitude = $\frac{3}{1}$
Period = $\frac{2\pi}{1}$ ($b = 2$)
Equation: $y = 3 \sin 2x$
11.

Amplitude = $\frac{4}{1}$
Period = $\frac{\pi}{2}$ ($b = 1$)
Equation: $y = 4 \cos x$
12.

Amplitude = $\frac{2}{1}$
Period = $\frac{4\pi}{1}$ ($b = \frac{1}{2}$)
Equation: $y = 2 \sin \frac{x}{2}$
13.

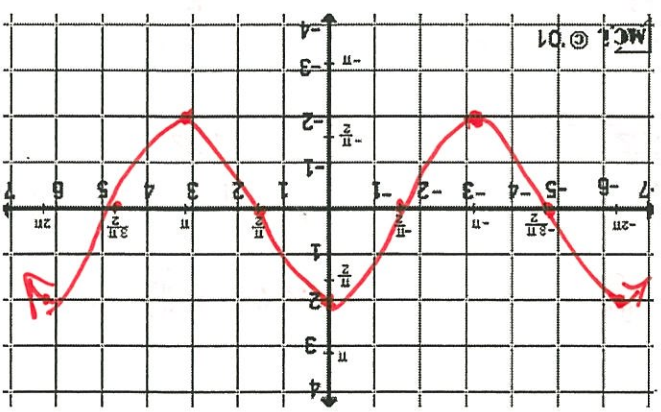
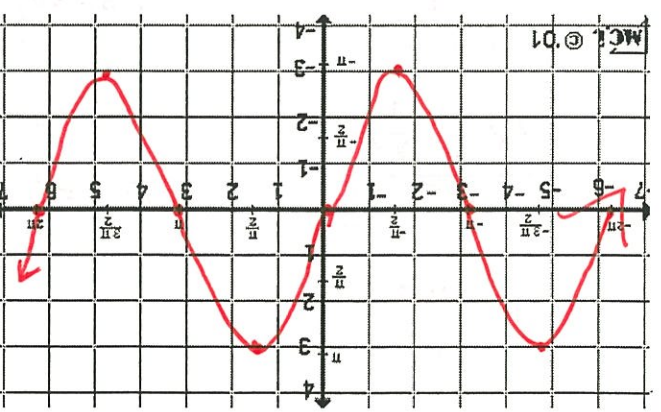
Amplitude = $\frac{5}{1}$ ($a = -5$)
Period = $\frac{2\pi}{1}$ ($b = 1$)
Equation: $y = -5 \cos x$

(MS #6)

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. $y = 3 \sin x$

15. $y = 2 \cos x$

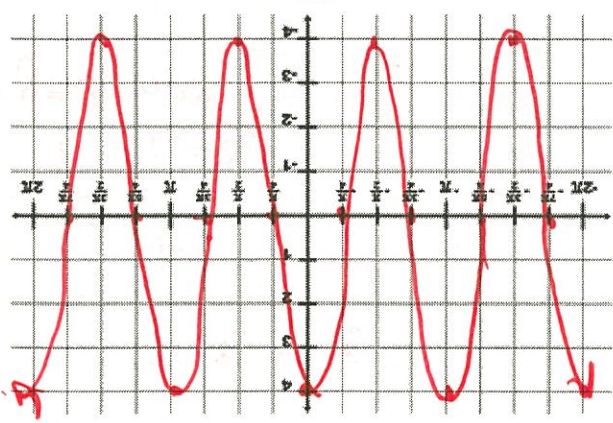
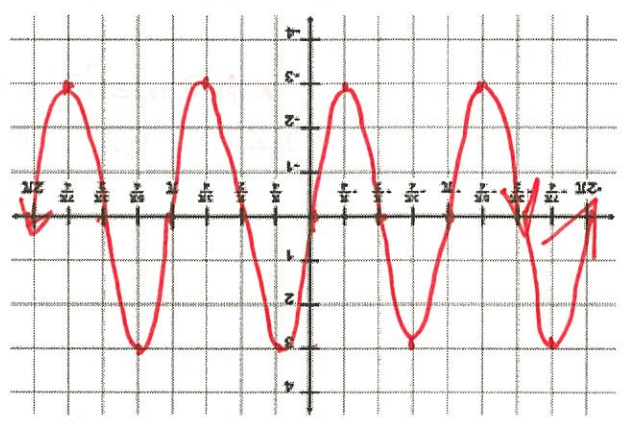


Amplitude = 3
Period = 2π

Amplitude = 2
Period = 2π

16. $y = 3 \sin 2x$

17. $y = 4 \cos 2x$



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

Amplitude = 4
Period = $\frac{2\pi}{2} = \pi$

$$y = 5 \sin \frac{x}{3}$$

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

$$\frac{3\pi}{1} = \frac{2\pi}{b}$$

$$3b = 2$$

$$b = \frac{2}{3}$$

$$y = 3 \cos \frac{4x}{3}$$

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

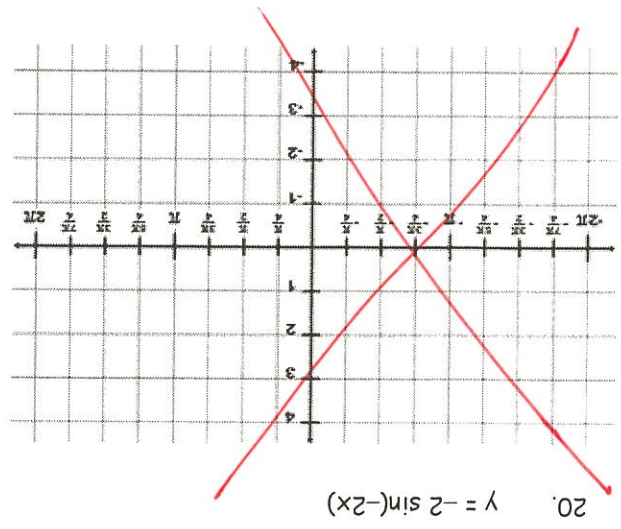
$$y = 4 \sin 2x$$

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

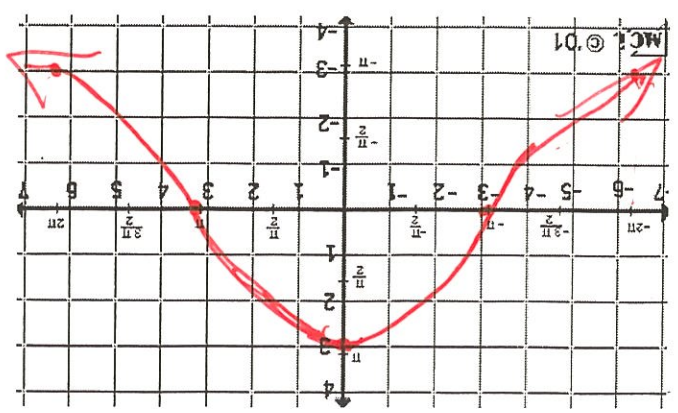
$$\frac{\pi}{1} = \frac{2\pi}{b}$$

$$b = 2$$

Amplitude = _____
Period = _____

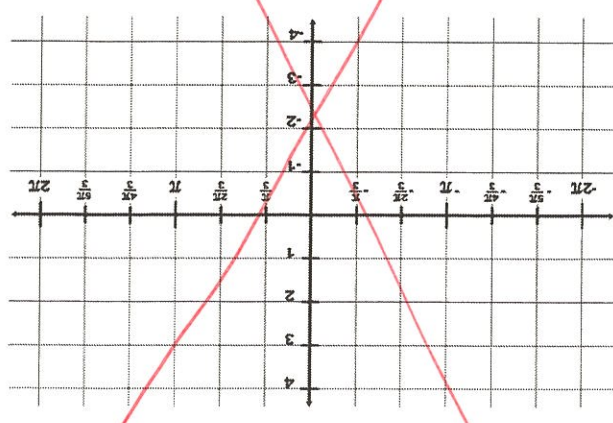


Amplitude = 3
Period = $4\pi = \frac{2\pi}{b}$



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

Amplitude = 1 ($a = -1$)
Period = $2\pi = \frac{2\pi}{b}$



19. $y = \cos(-3x)$

$$y = -\cos 3x$$

$$3b\pi = 4\pi$$

$$3b = 4$$

$$b = \frac{4}{3}$$

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

$$b = 2$$

