

Pre-Calc Honors

Graphing Sine & Cos Functions

Name: Key Per: _____

Find the amplitude, the period in radians, the vertical shift, and the minimum and maximum values. Then sketch the graph using radians.

1. $y = 4 \sin\left(\frac{x}{4} + \frac{5\pi}{4}\right) - 1$ $f = 4 \sin\left(\frac{1}{4}(x + 5\pi)\right) - 1$

b. Period: 8π

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

c. Amplitude: 4

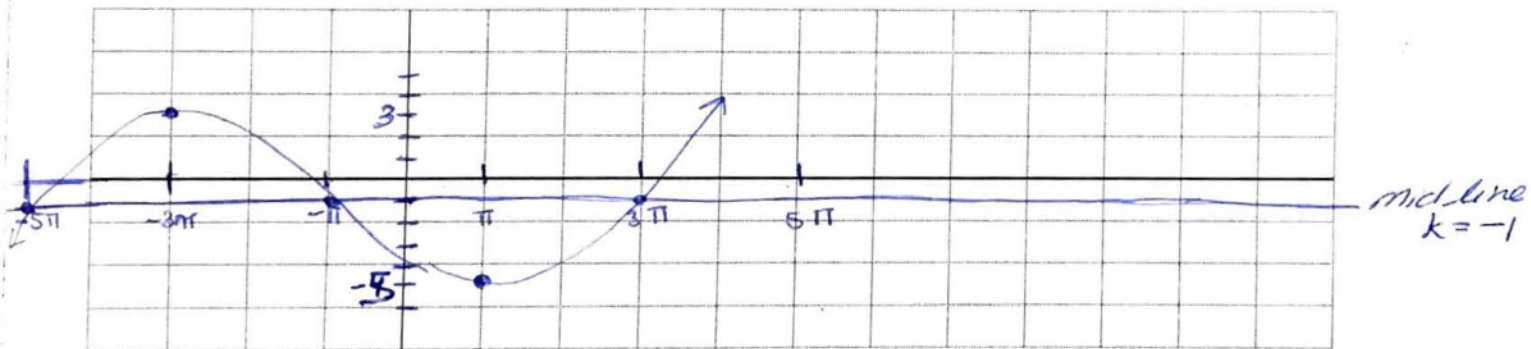
max: 3 min: -5

d. Phase shift: -5π (left)

e. Vertical shift: -1

Period = $\frac{2\pi}{\frac{1}{4}} = 8\pi$ Inc = $\frac{8\pi}{4} = 2\pi$

X	New	Y
0	-5π	-1
2π	-3π	3
4π	$-\pi$	-1
6π	π	-5
8π	3π	-1



2. $y = -\frac{1}{3} \cos\left(\frac{x}{2} + \frac{\pi}{3}\right) \rightarrow y = -\frac{1}{3} \cos\left(\frac{1}{2}\left(x + \frac{2\pi}{3}\right)\right)$

b. Period: 4π

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

c. Amplitude: $\frac{1}{3}$

max: $\frac{1}{3}$ min: $-\frac{1}{3}$

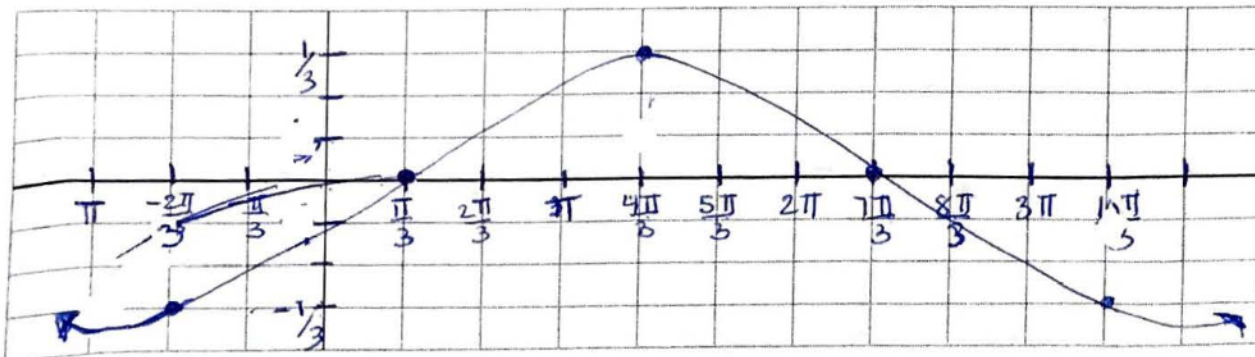
d. Phase shift: $-\frac{2\pi}{3}$ (Left)

e. Vertical shift: None

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

X	New	Y
0	$-\frac{2\pi}{3}$	$-\frac{1}{3}$
$\frac{3\pi}{3} = \pi$	$\frac{\pi}{3}$	0
$\frac{6\pi}{3} = 2\pi$	$\frac{4\pi}{3}$	$\frac{1}{3}$
$\frac{9\pi}{3} = 3\pi$	$\frac{7\pi}{3}$	0
$\frac{12\pi}{3} = 4\pi$	$\frac{10\pi}{3}$	$-\frac{1}{3}$

$2\pi \div \frac{1}{2}$
 $2\pi \cdot \frac{2}{1}$
 4π



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

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

b. Period: 2π

"b" = 1

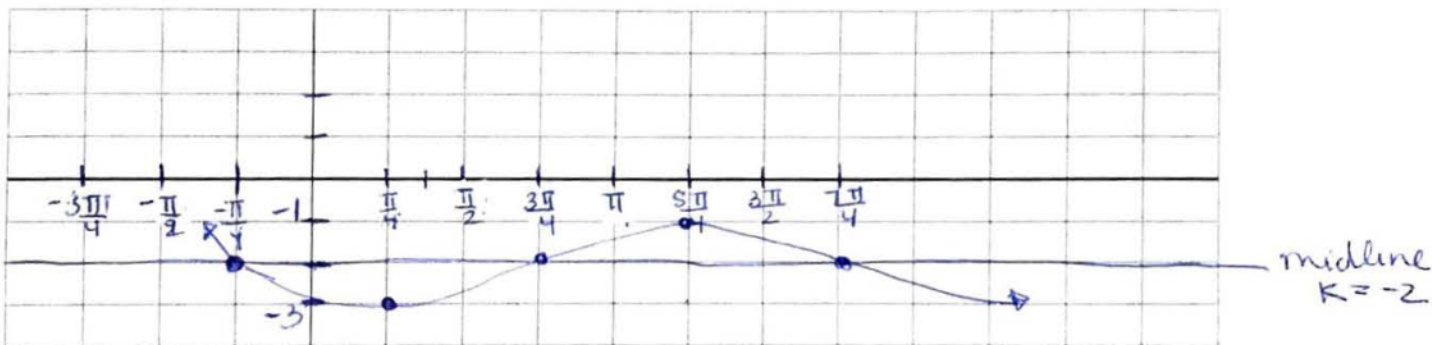
c. Amplitude: 1

max: -1 min: -3

d. Phase shift: $-\frac{\pi}{4}$

e. Vertical shift: -2

X	New	Y
0	$-\frac{\pi}{4}$	-2
$\frac{2\pi}{4} = \frac{\pi}{2}$	$\frac{\pi}{4}$	-3
$\frac{4\pi}{4} = \pi$	$\frac{3\pi}{4}$	-2
$\frac{6\pi}{4} = \frac{3\pi}{2}$	$\frac{5\pi}{4}$	-1
$\frac{8\pi}{4} = 2\pi$	$\frac{7\pi}{4}$	-2



4. $y = \cos(3x + 2\pi) + 4 \rightarrow y = \cos 3\left(x + \frac{2\pi}{3}\right) + 4$ $\frac{2\pi}{3} \Rightarrow +\frac{\pi}{6}$ Period = $\frac{2\pi}{3}$ Inc = $\frac{2\pi}{4} = \frac{2\pi}{12} = \frac{\pi}{6}$

b. Period: $\frac{2\pi}{3}$

"b" = 3

c. Amplitude: 1

max: 5 min: 3

d. Phase shift: $\frac{2\pi}{3}$ (right)

e. Vertical shift: 4

X	New	Y
0	$\frac{4\pi}{6} = \frac{2\pi}{3}$	5
$\frac{\pi}{6}$	$\frac{5\pi}{6}$	4
$\frac{2\pi}{6}$	$\frac{6\pi}{6} = \pi$	3
$\frac{3\pi}{6}$	$\frac{7\pi}{6}$	4
$\frac{4\pi}{6}$	$\frac{8\pi}{6} = \frac{4\pi}{3}$	5

