

Graphing Assignment

Thursday, October 1, 2020 10:03 AM

Pre-Calculus 12

Name : _____

Block : _____

Chapter 5 Trigonometric Functions and Graphs Assignment

1. Determine the key features for the function $y = -5\sin\left(\frac{1}{2}\left(x - \frac{\pi}{2}\right)\right) + 15$

a) Amplitude: $| -5 | = 5$

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

c) Phase Shift: right $\pi/2$

d) Vertical displacement: up 15

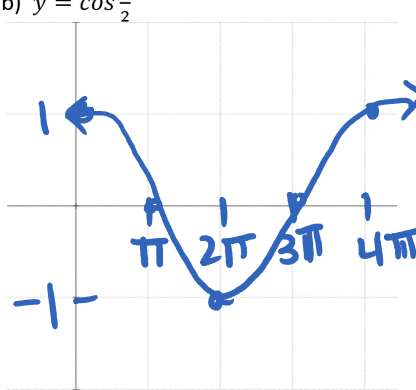
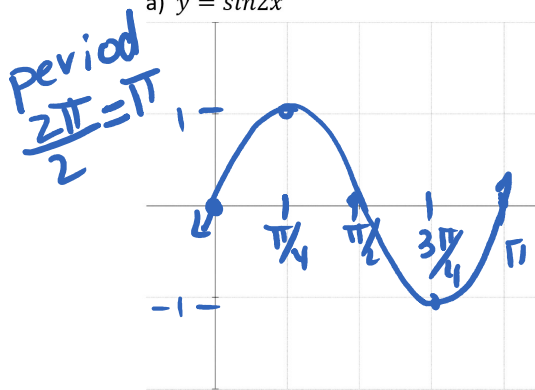
e) Domain: $\{x \mid x \in \mathbb{R}\}$

f) Range: $\{y \mid 10 \leq y \leq 20, y \in \mathbb{R}\}$

2. Graph the following functions and label the axis. (at least one period)

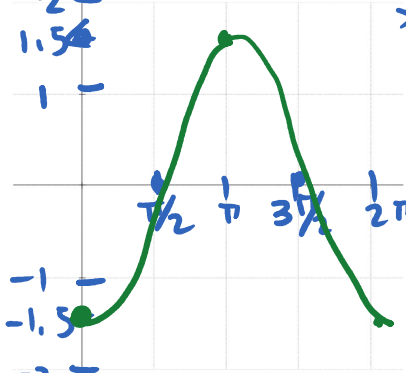
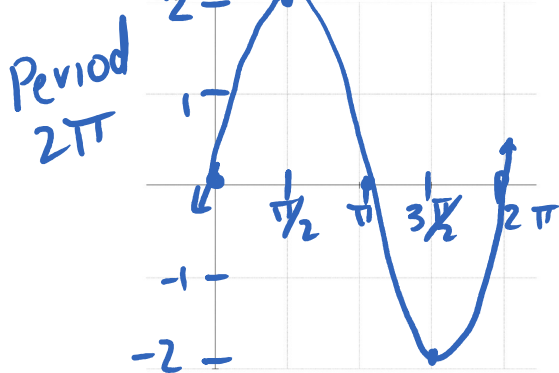
a) $y = \sin 2x$

b) $y = \cos \frac{x}{2}$



c) $y = 2\sin x$

d) $y = -1.5\cos x$



3. Write the equation of each sine function in the form $y = a \sin b(x - c) + d$ given its characteristics.

a) amplitude 2, period π , phase shift $\frac{\pi}{3}$ to the left, vertical displacement 1 unit down

$\frac{2\pi}{b} = \pi$
 $b = 2$
 $y = 2 \sin 2(x + \frac{\pi}{3}) - 1$

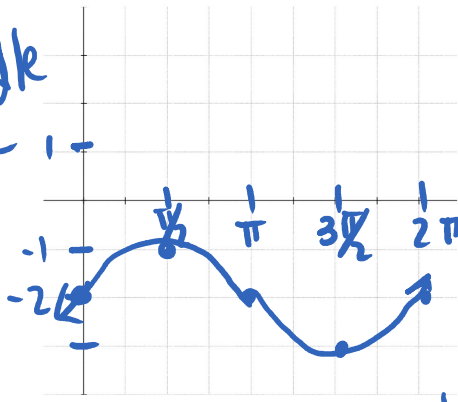
b) amplitude $\frac{1}{4}$, period 6π , phase shift π to the right, vertical displacement 2 units up.

$\frac{2\pi}{b} = 6\pi$
 $b = \frac{1}{3}$
 $y = \frac{1}{4} \sin \frac{1}{3}(x - \pi) + 2$

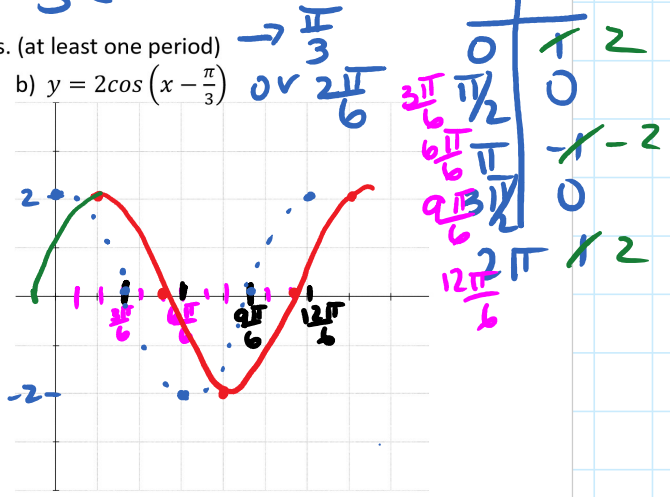
4. Graph the following functions and label the axis. (at least one period)

a) $y = \sin x - 2$

Middle line (-2)

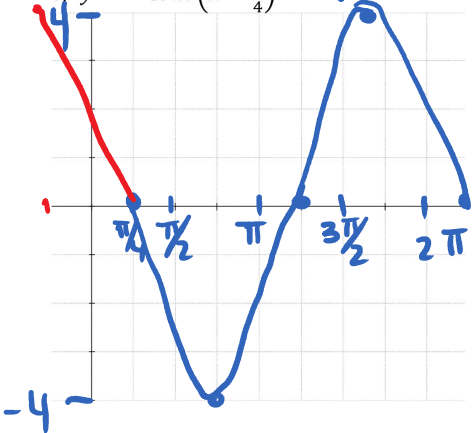


b) $y = 2 \cos(x - \frac{\pi}{3})$



c) $y = -4 \sin(x - \frac{\pi}{4})$

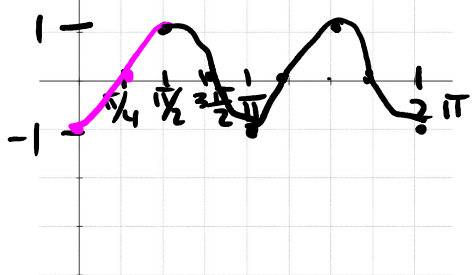
Reflection



d) $y = \cos(2x - \pi)$

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

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

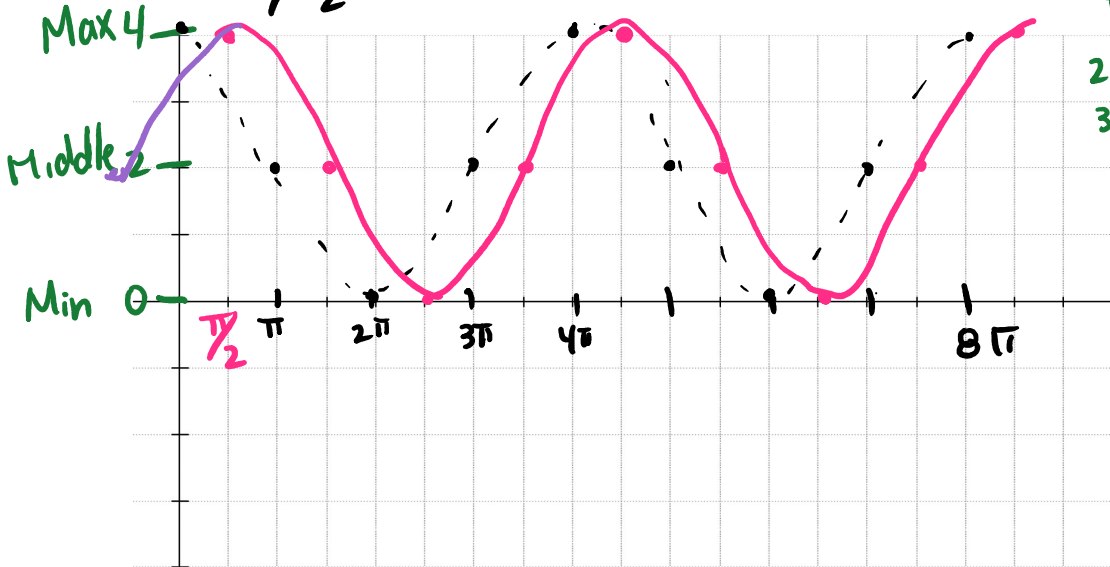


5. Graph the following function (show 2 periods) State the period and phase shift

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

period: $\frac{2\pi}{\frac{1}{2}} = 4\pi$

phase shift: $\rightarrow \frac{\pi}{2}$



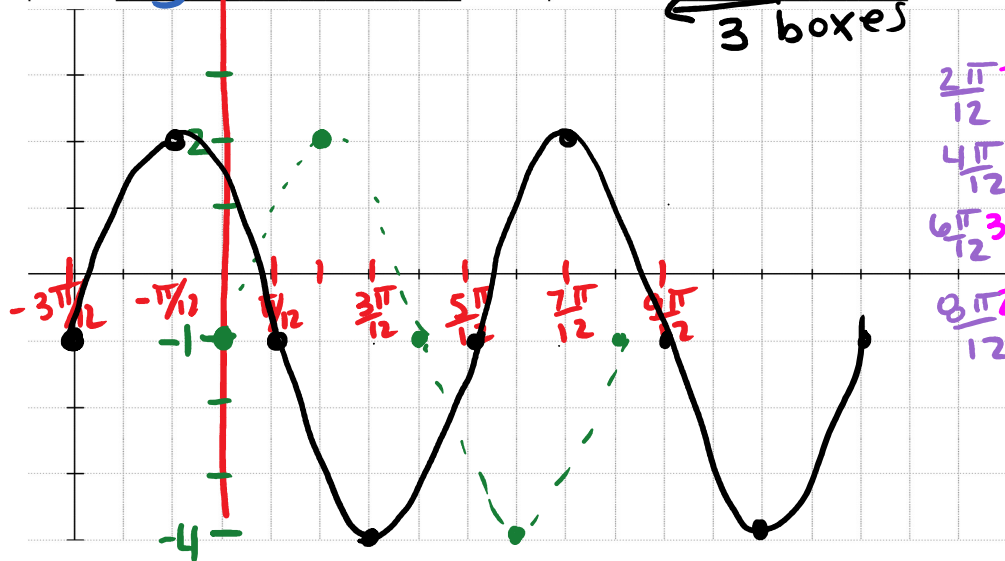
divide x's by 1/2

0	1
π	0
2π	-1
3π	0
4π	1

b) $y = 3\sin 3\left(x + \frac{\pi}{4}\right) - 1$

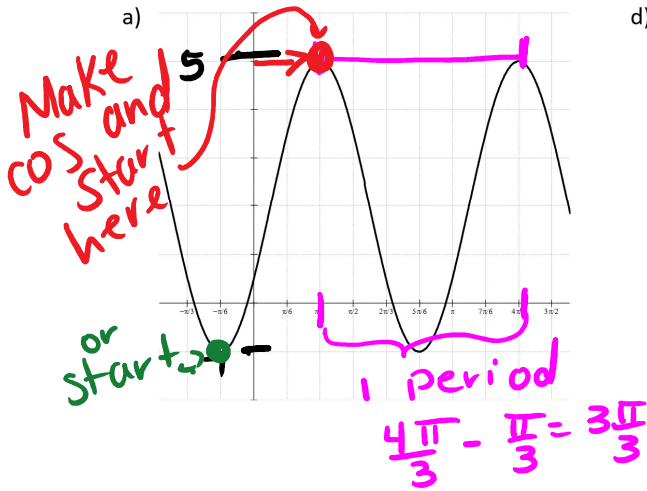
period: $\frac{2\pi}{3} = \frac{8\pi}{12}$

phase shift: $\leftarrow \frac{\pi}{4} = \frac{3\pi}{12}$
3 boxes



0	0	0
$\frac{2\pi}{12}$	$\frac{\pi}{6}$	$\frac{\pi}{2}$
$\frac{4\pi}{12}$	$\frac{\pi}{3}$	π
$\frac{6\pi}{12}$	$\frac{3\pi}{6}$	$\frac{3\pi}{2}$
$\frac{8\pi}{12}$	$\frac{2\pi}{3}$	2π

6. Write an equation to represent the graph below.



$$\text{Amp} = \frac{|5 - (-1)|}{2} \quad \pi = \frac{2\pi}{b}$$

$$\text{Amp} = 3 \quad \pi b = 2\pi$$

$$\text{VD} = 5 - 3 \quad b = 2$$

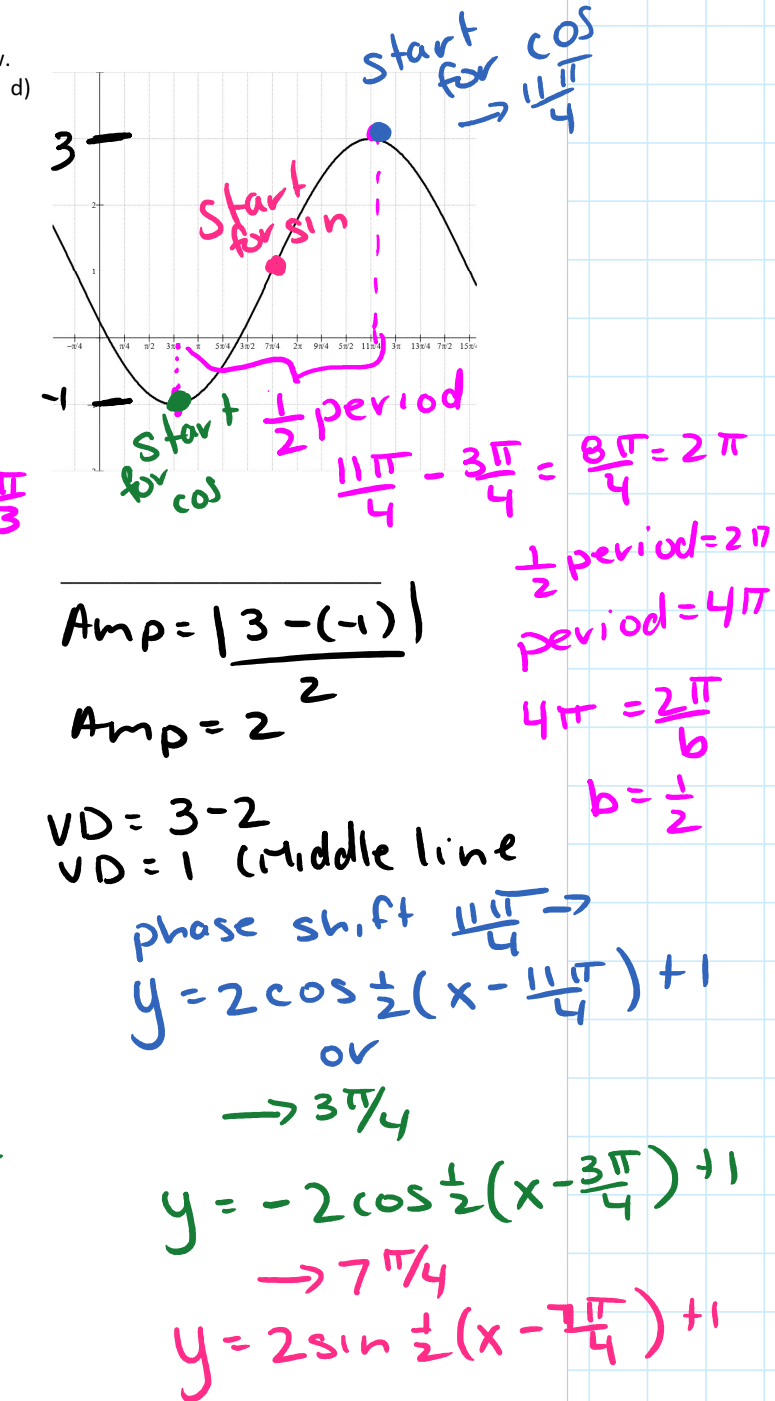
$$\text{VD} = 2 \text{ (middle line)}$$

phase shift $\rightarrow \frac{\pi}{3}$

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

or $\frac{\pi}{6} \leftarrow$

$$y = -3 \cos 2\left(x + \frac{\pi}{6}\right) + 2$$



$$\text{Amp} = \frac{|3 - (-1)|}{2}$$

$$\text{Amp} = 2$$

$$\text{VD} = 3 - 2$$

$$\text{VD} = 1 \text{ (middle line)}$$

phase shift $\frac{11\pi}{4} \rightarrow$

$$y = 2 \cos \frac{1}{2}\left(x - \frac{11\pi}{4}\right) + 1$$

or

$$\rightarrow \frac{3\pi}{4}$$

$$y = -2 \cos \frac{1}{2}\left(x - \frac{3\pi}{4}\right) + 1$$

$$\rightarrow \frac{7\pi}{4}$$

$$y = 2 \sin \frac{1}{2}\left(x - \frac{7\pi}{4}\right) + 1$$