

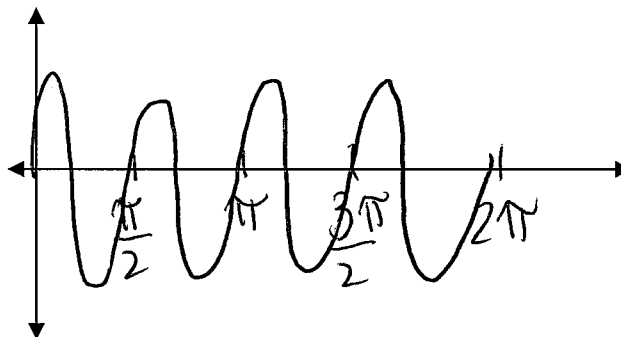
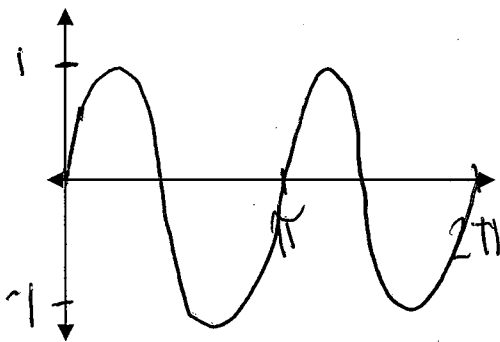
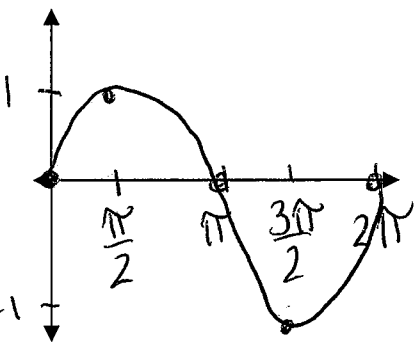
LESSON #3: FREQUENCY AND PERIOD

Do Now: using your calculator sketch the following curves from 0 to  $2\pi$ .

a)  $y = \sin x$

b)  $y = \sin 2x$

c)  $y = \sin 4x$



$y = A \sin(Bx)$   
 $y = A \cos(Bx)$

Frequency: The number of full waves (curves) between 0 and  $2\pi$ .

- "B"-Value

Graph	Interval	Frequency	Where the 1 <sup>st</sup> wave ends
a: $y = \sin x$	$2\pi$	1	$2\pi$
b: $y = \sin 2x$	$2\pi$	2	$\pi$
c: $y = \sin 4x$	$2\pi$	4	$\frac{\pi}{2}$

Period: The length of the interval needed to see one full wave.

- Formula:  $\frac{2\pi}{b}$        $b = \text{frequency}$

State the amplitude, frequency, and period of each graph:

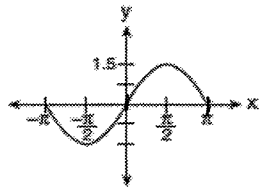
1)  $y = 3 \sin x$   
amp = 3  
freq = 1  
period =  $\frac{2\pi}{1}$

2)  $y = -4 \sin \frac{1}{2} x$   
amp = 4  
freq =  $\frac{1}{2}$   
period =  $\frac{2\pi}{\frac{1}{2}} = 4\pi$

3)  $y = \frac{1}{4} \cos 4x$   
amp =  $\frac{1}{4}$   
freq = 4  
period =  $\frac{2\pi}{4} = \frac{\pi}{2}$

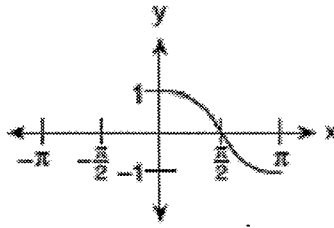
Write the equation of each trig graph:

4)



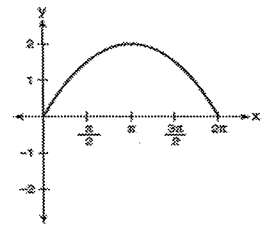
$$y = 1.5 \sin x$$

5)



$$y = \cos x$$

6)



$$y = \frac{1}{2} \sin x$$

7) Write the equation of a cosine graph if its amplitude is 4 and its period is  $\frac{\pi}{3}$ .

need 'b' value

$$\text{period} = \frac{\pi}{3} = \frac{2\pi}{b}$$

$$2\pi b = 6\pi$$

$$b = 6$$

$$a = 4$$

$$y = 4 \cos 6x$$

8) Write the equation of a sine graph if its amplitude is  $\frac{1}{2}$  and its period is 4.

$$\text{period} = \frac{4}{1} = \frac{2\pi}{b}$$

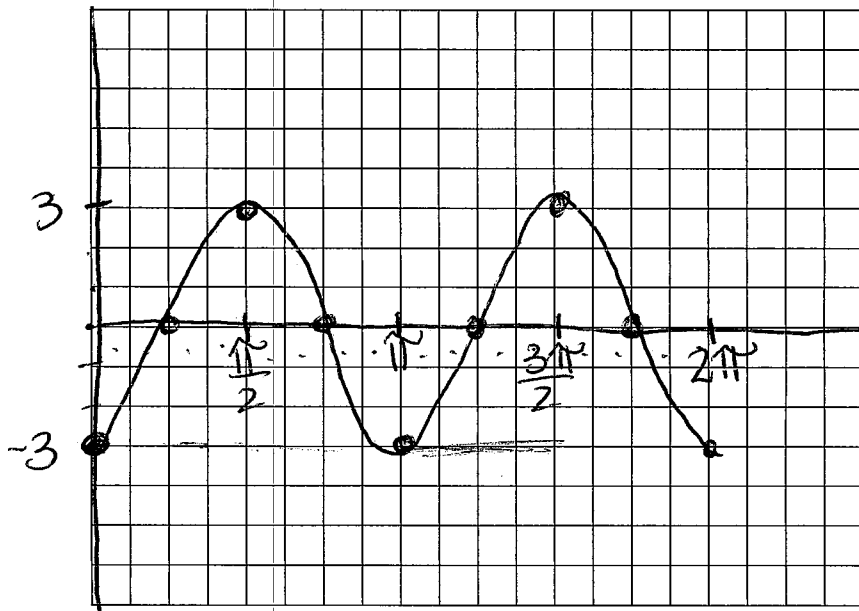
$$\frac{2\pi}{4} = \frac{4b}{4}$$

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

$$y = \frac{1}{2} \sin \frac{\pi}{2} x$$

9) Graph  $y = -3 \cos 2x$  in the interval  $0 \leq x \leq 2\pi$ .

1st wave ends @  $\pi$



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

$$\text{freq} = 2$$

a. In which quadrants does  $y = -3 \cos 2x$  increase?

Q I and Q III

b. In which quadrants does  $y = -3 \cos 2x$  decrease?

Q II and Q IV