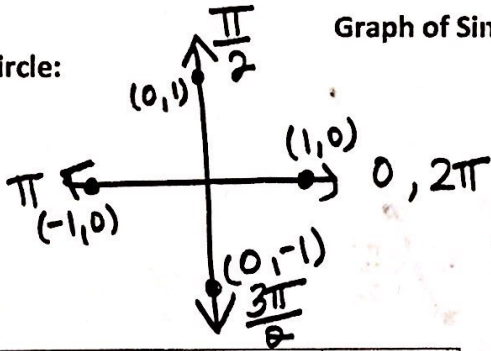


## Graph of Sine and Cosine

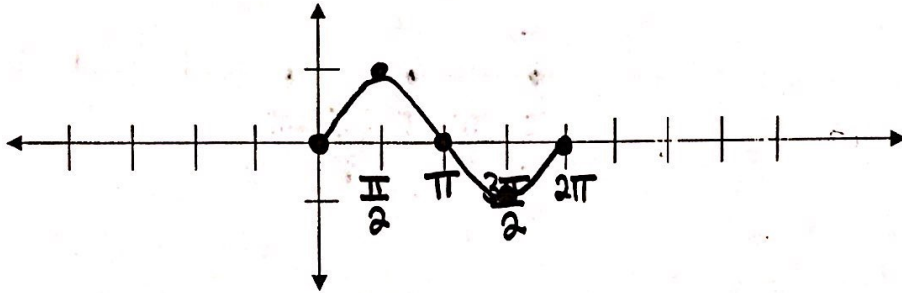
Recall the unit circle:



(cos, sin)

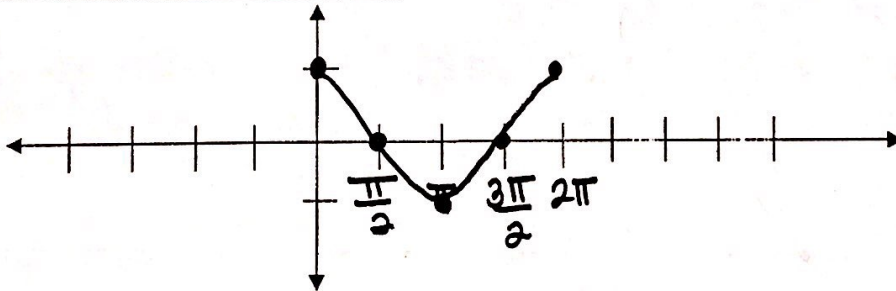
$y = \sin x$

x	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
y	0	1	0	-1	0



$y = \cos x$

x	0	$\pi/2$	$\pi$	$3\pi/2$	$2\pi$
y	1	0	-1	0	1



These are the basic shapes of sin and cos. The period of both of the graphs is  $2\pi$ . The period is the length of one cycle.

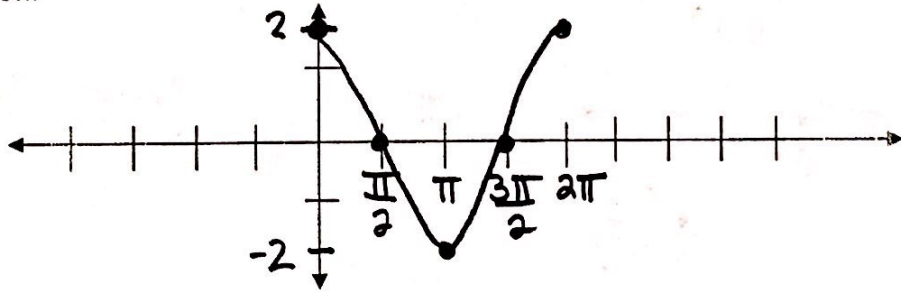
For  $y = a \sin bx$  and  $y = a \cos bx$

- $|a|$  = the amplitude of the function. Amplitude is half the difference between its maximum and minimum. For example, the sine curve above is 2 units tall, so its amplitude is 1. For now, the amplitude will just be the height from the x-axis.
- $\frac{2\pi}{b}$  = the period of the function. Period is the length of 1 cycle.
- $b$  = the number of cycles in the interval from 0 to  $2\pi$ .

Examples: Graph each function.

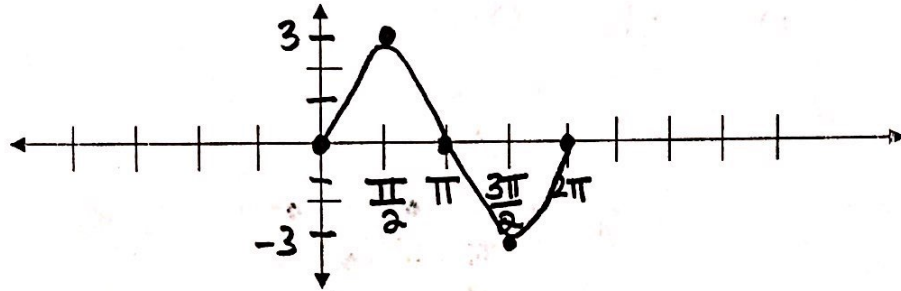
1)  $y = 2 \cos x$   
amp: 2

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



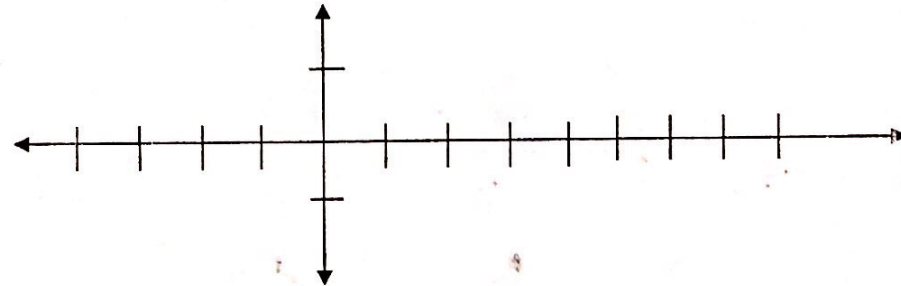
2)  $y = 3 \sin x$   
amp: 3

period:  $2\pi$



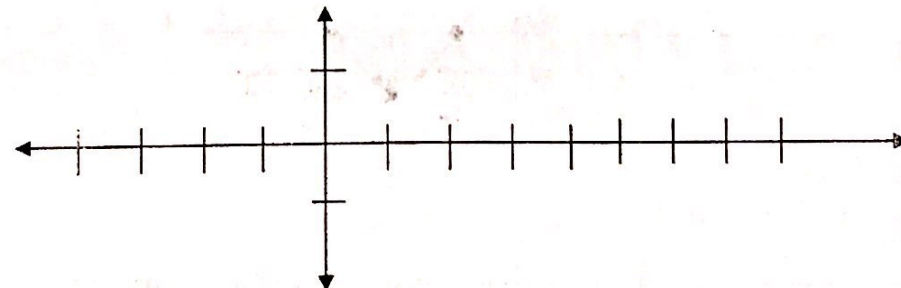
3)  $y = -\cos x$   
amp:

period:



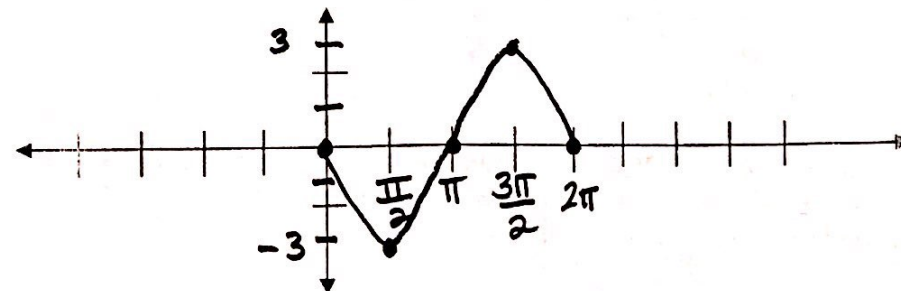
4)  $y = 2 \sin x$   
amp:

period:



5)  $y = -3 \sin x$   
amp: 3

period:  $2\pi$



6)  $y = -\frac{1}{2} \cos x$   
amp:  $\frac{1}{2}$

period:  $2\pi$

