

Warm-up 1/24/17

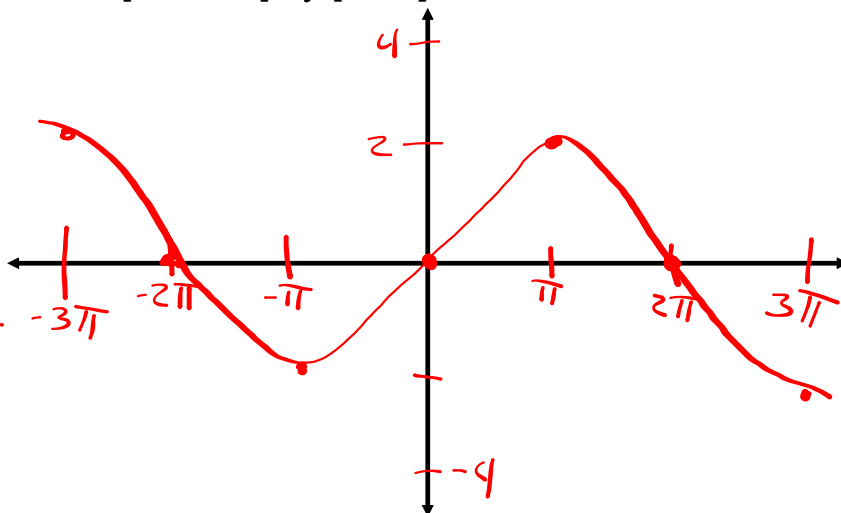
Find the amplitude, period, and frequency of the following equation.  
Then graph it in the window  $[-3\pi, 3\pi]$  by  $[-4, 4]$ .

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

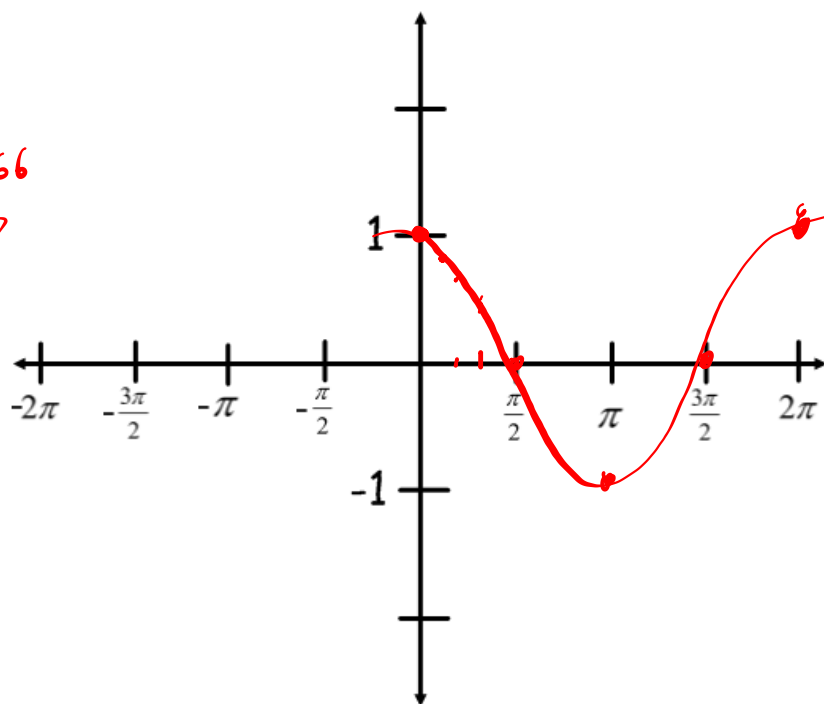
$$\text{amp.} = 2$$

$$\text{Per.} = \frac{2\pi}{\frac{1}{2}} = 4\pi$$

$$\text{fre.} = \frac{1}{4\pi}$$

Graph  $y = \cos x$ .

x	y
0	1
$\pi/6$	$\sqrt{3}/2 \approx .866$
$\pi/4$	$\sqrt{2}/2 \approx .707$
$\pi/3$	$1/2$
$\pi/2$	0
$\pi$	-1
$3\pi/2$	0
$2\pi$	1



Graphs of Sinusoids

The graphs of  $y = a \sin (b(x - h)) + k$  and  $y = a \cos (b(x - h)) + k$  (where  $a \neq 0$  and  $b \neq 0$ ) have the following characteristics:

$$\text{amplitude} = |a|;$$

$$\text{period} = \frac{2\pi}{|b|};$$

$$\text{frequency} = \frac{|b|}{2\pi}.$$

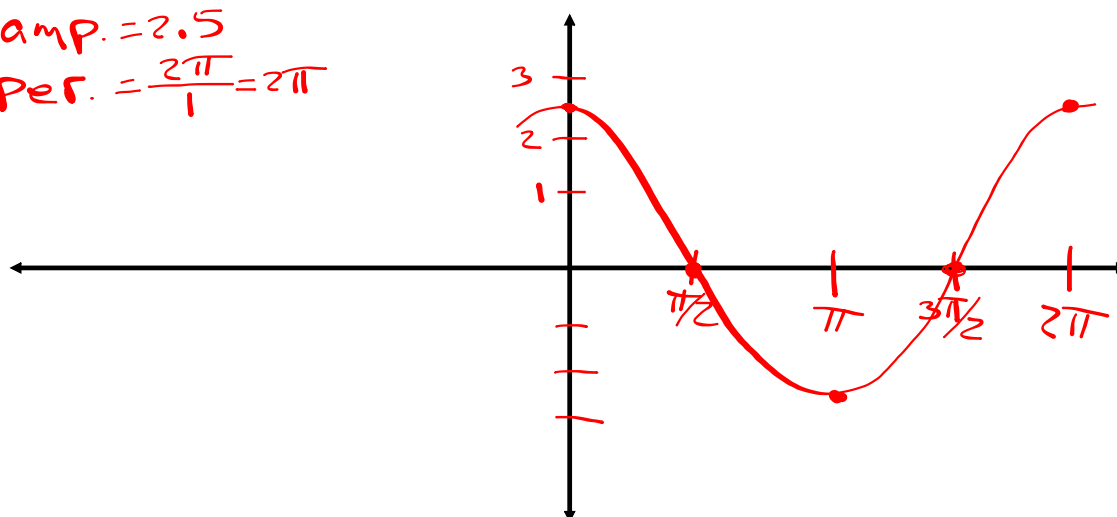
When compared to the graphs of  $y = a \sin bx$  and  $y = a \cos bx$ , respectively. They also have the following characteristics:

a phase shift of  $h$ ; a vertical translation of  $k$ .

Graph  $y = 2.5 \cos x$

$$\text{amp.} = 2.5$$

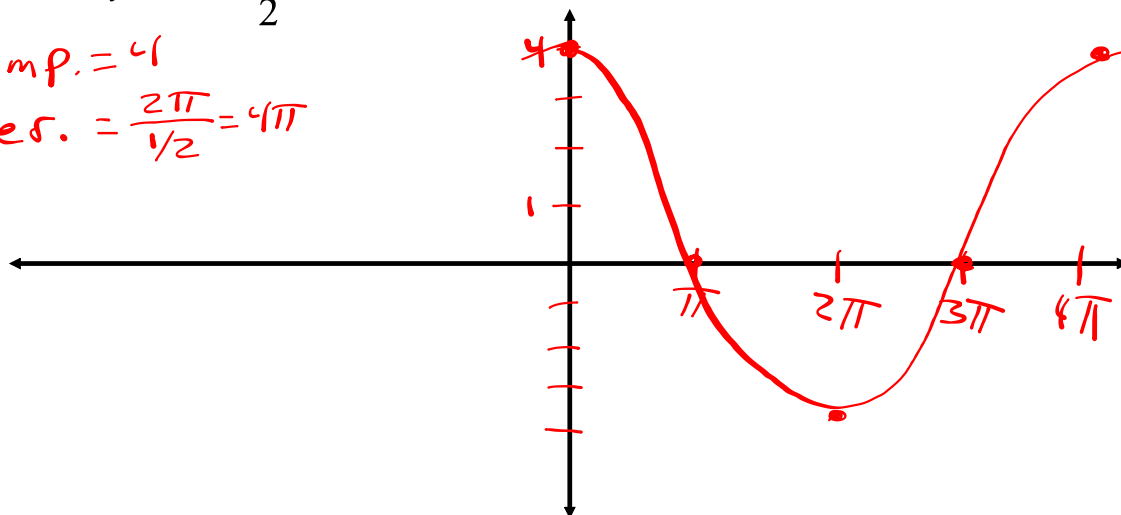
$$\text{per.} = \frac{2\pi}{1} = 2\pi$$



Graph  $y = 4 \cos \frac{1}{2}x$

amp. = 4

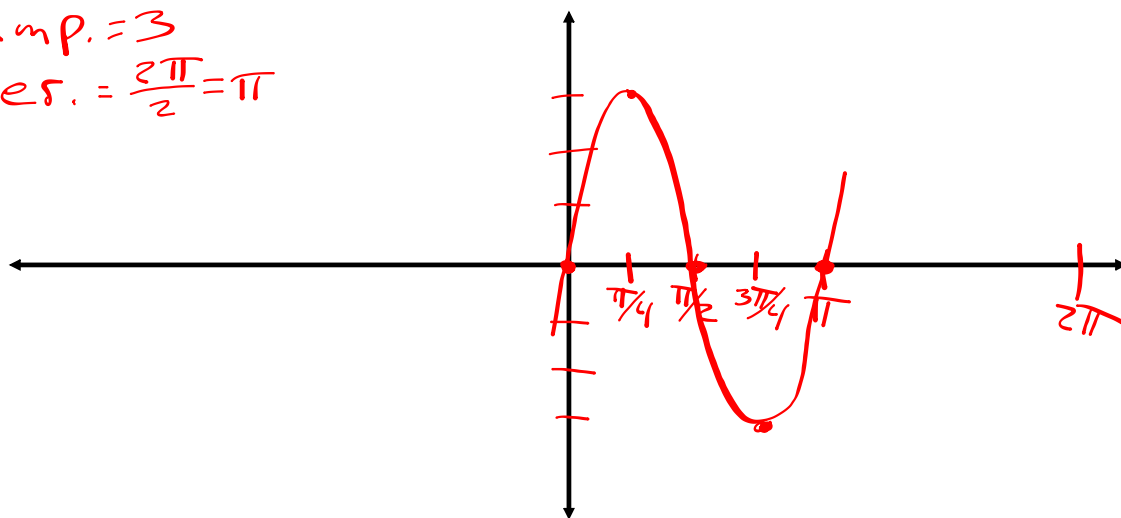
per. =  $\frac{2\pi}{1/2} = 4\pi$



Graph  $y = 3 \sin 2x$

amp. = 3

per. =  $\frac{2\pi}{2} = \pi$



Assignment: pp. 357 - 359  
7-14,19-28,83

Construct a sinusoid  $y = f(x)$  that rises from a minimum value of  $y = 5$  and  $x = 0$  to a maximum value of  $y = 25$  at  $x = 32$ .