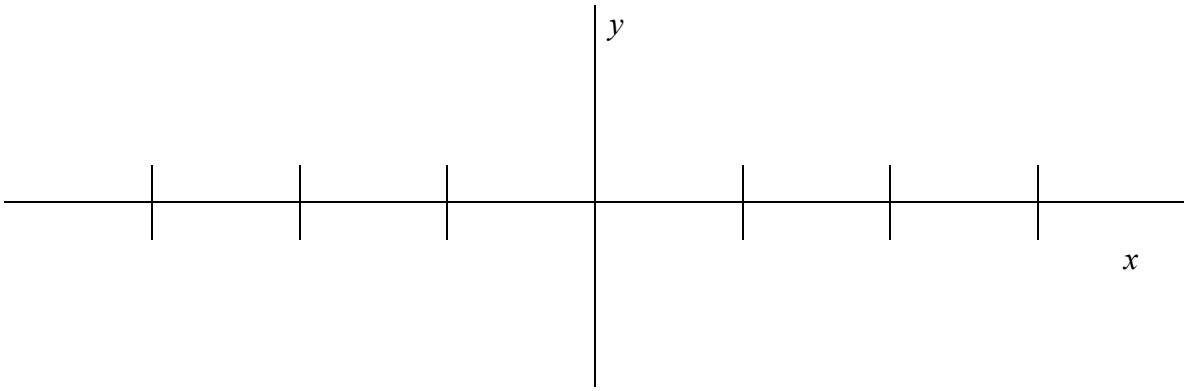
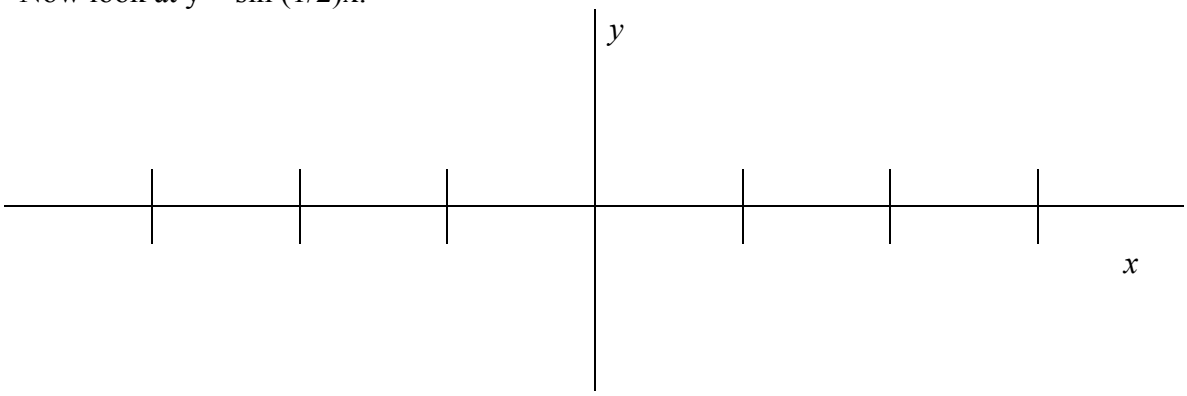
Section 5.6
Amplitude, Period, Phase Shift

Draw y = sin x. Then draw y = cos x.



Note that one complete cycle, or period, occurs from 0 to 2π.

Now look at y = sin (1/2)x.



What is the period for this graph?

PERIOD for y = Acos (Bx), y = Asin (Bx), y = Asec (Bx), and y = Acsc (Bx) is: $T = \frac{2\pi}{|B|}$

And AMPLTITUDE is: $|A|$

PERIOD for y = Atan (Bx) and y = Acot (Bx) is: $T = \frac{\pi}{|B|}$

EXAMPLES: Find the amplitude and period for each function.

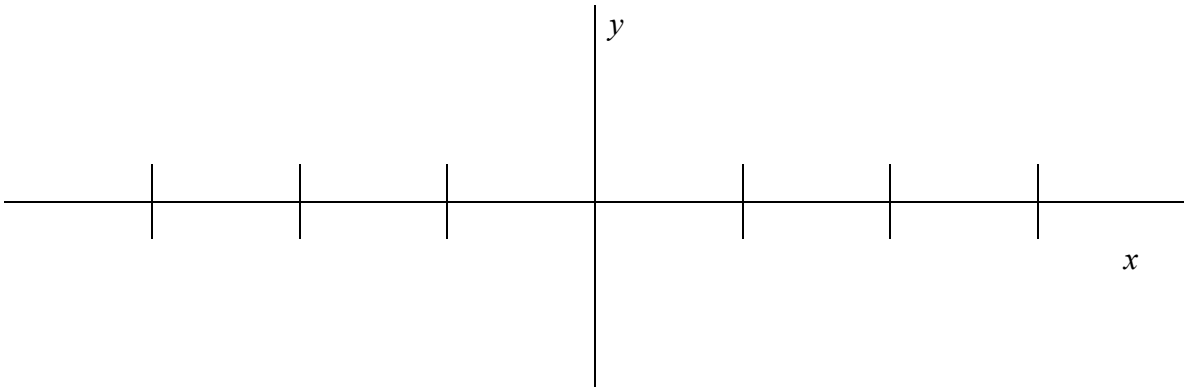
1) $y = -2\sin 3t$

2) $y = 3\cos(-2t)$

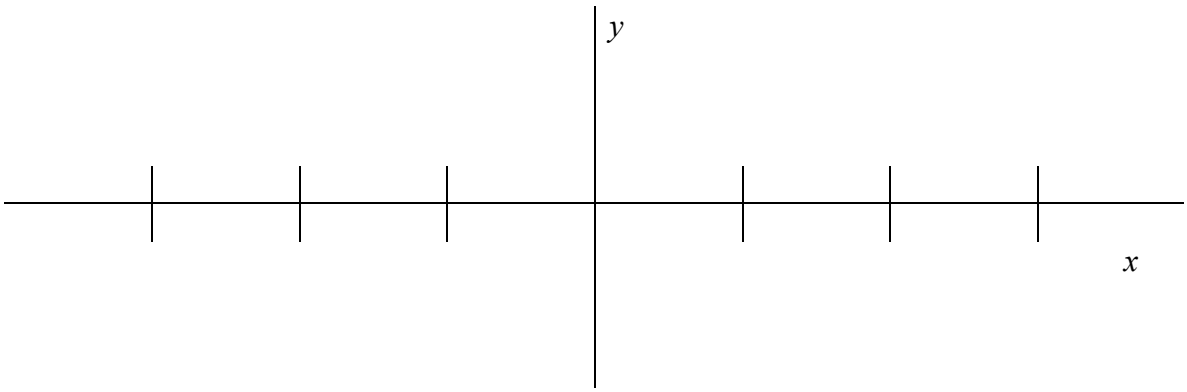
3) $y = 2\cos t$

4) $y = 2\sin(t + \pi/2)$

Now, let's graph the last two functions on the same axis.



Compare $y = 2\sin(t + \pi/4)$ with $y = 2\cos(t - \pi/4)$.



PERIOD & PHASE SHIFTS

For $y = A\sin(Bx - C)$, $y = A\cos(Bx - C)$, $y = A\sec(Bx - C)$, and $y = A\csc(Bx - C)$

and $B > 0$

the phase shift is found by solving: $Bx - C = 0$

EXAMPLES- Find the amplitude, period, and phase shift for each function.

1) $y = 3\sin(2\pi x - \pi)$

2) $y = -2\cos(3x + \pi)$

In working with function where $B < 0$ it will be helpful to factor out -1 and then use the fact that the function is even or odd.

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

4) $y = -2\sin(-3x + \pi/2)$

Now let's work some EGRADE problems.