GRAPHING TRIG FUNCTIONS

Periodic functions —
   repeat on regular intervals

Amplitude- from $\overset{\text{distance}}{\text{X-axis}}$ to peak
   normal amp = 1

period — (wavelength)
      the length of one cycle of
                                   the wave
   normal = 2π

Sin x starts on the x-axis
      & moves upward
Cos x starts at a peak & moves downward

$\sin(x)$ per = 2π

$\sin\left(\frac{1}{4}x\right)$ per = 8π $\frac{2\pi}{1/4}$
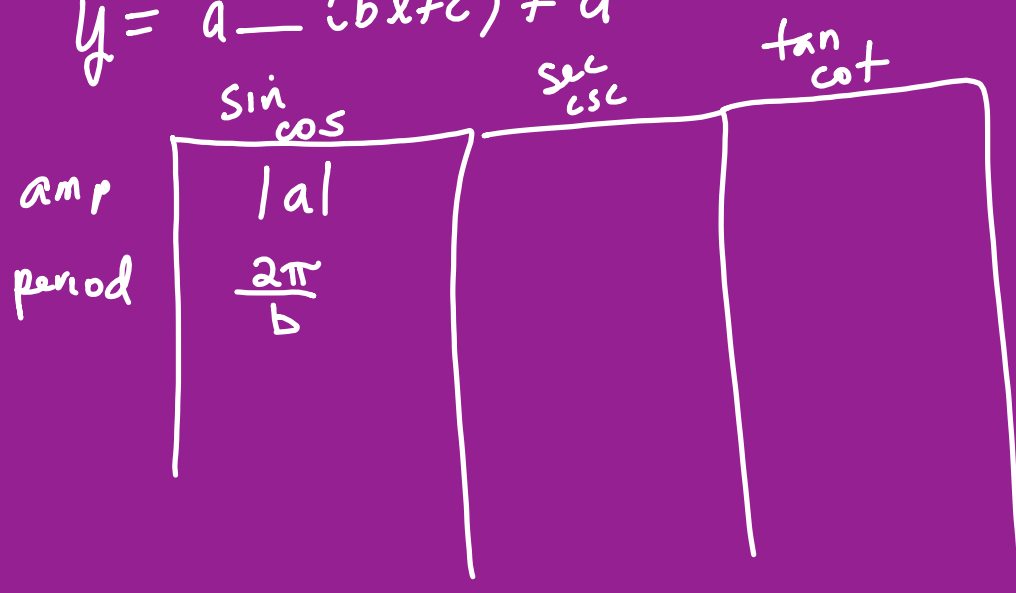
$\sin(2x)$ per = π $\frac{2\pi}{2}$
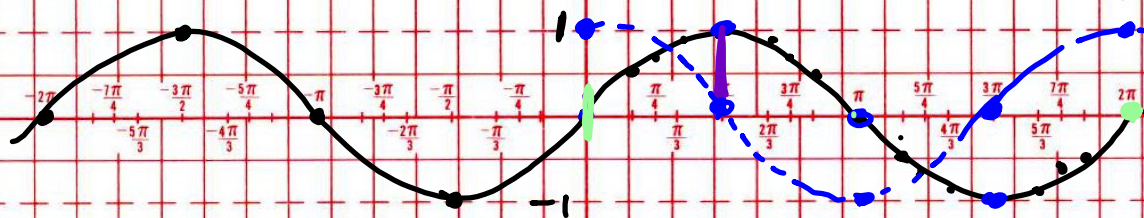
* Characteristics of
     trig graphs

* Graphs of $\sin x$ &
                     $\cos x$

* Amplitude & period
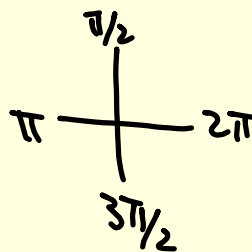   changes

$$y = a \underline{\quad} (bx + c) + d$$

	sin cos	sec csc	tan cot
amp	$|a|$		
period	$\dfrac{2\pi}{b}$		

$y = \sin x$

0	0
$\pi/6$	$1/2$
$\pi/4$	$\sqrt{2}/2 = 0.7$
$\pi/3$	$\sqrt{3}/2 = 0.86$
$\pi/2$	1

$\pi/2$

π — 2π

$3\pi/2$

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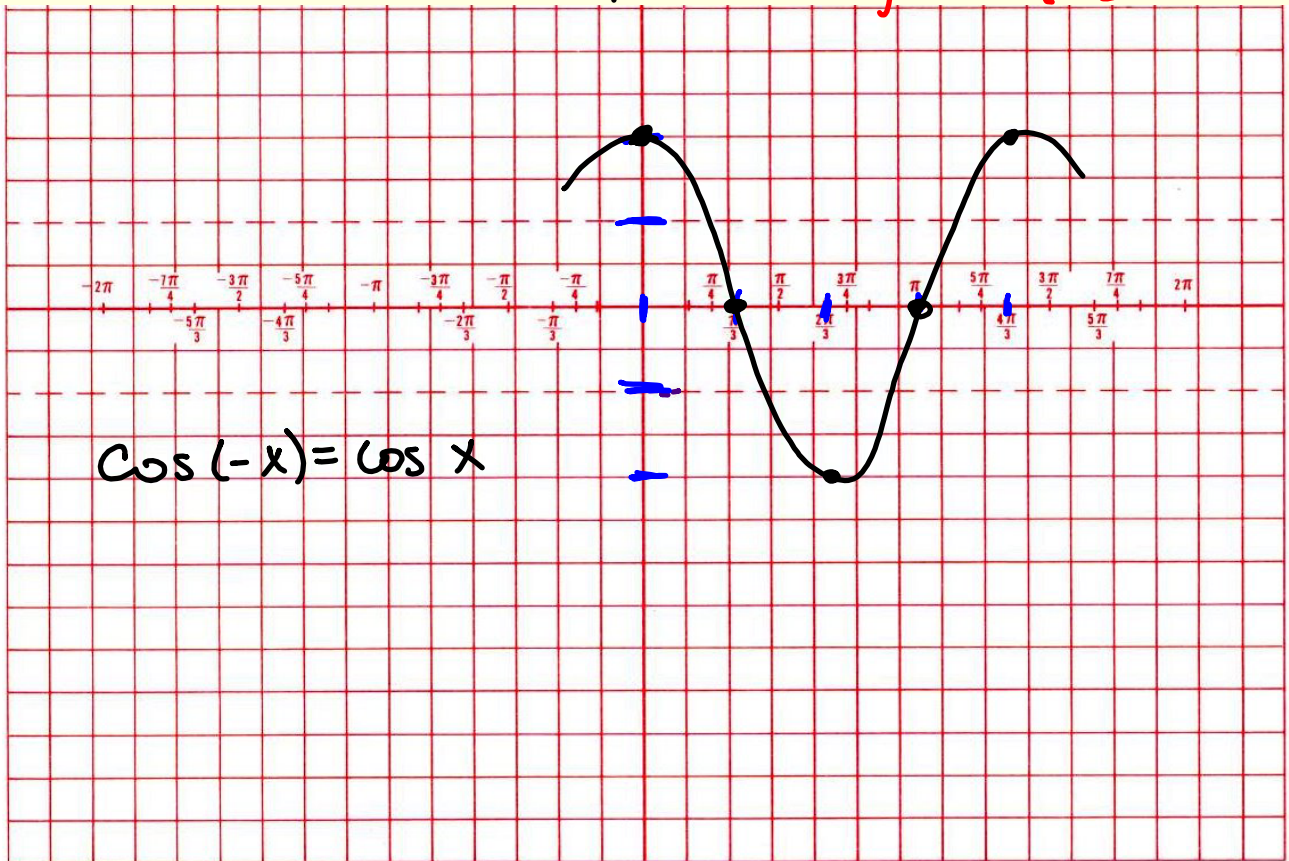
amp = 2

period = $\frac{2\pi}{3/2} = \frac{4\pi}{3}$

spacing = per $* \frac{1}{4}$

$\frac{4\pi}{3} \cdot \frac{1}{4} = \frac{\pi}{3}$

$0 \quad \frac{\pi}{3} \quad \frac{2\pi}{3} \quad \frac{3\pi}{3} \quad \frac{4\pi}{3}$

$y = \sin\left(-\frac{3x}{2}\right)$

$y = -\sin\left(2/3 x\right)$

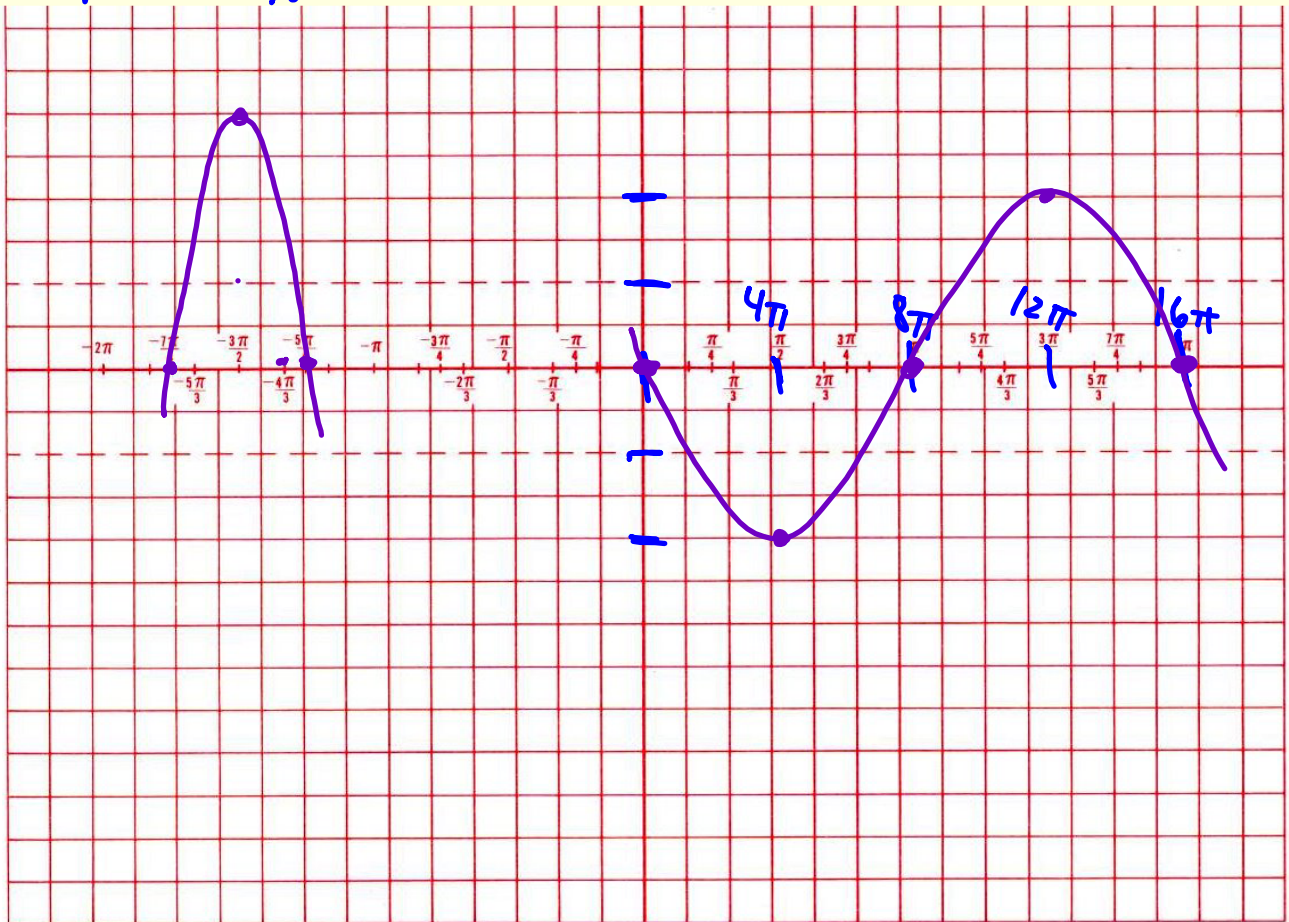$\cos(-x) = \cos x$

$$y = -2 \sin\left(\tfrac{1}{8}x\right)$$

spacing

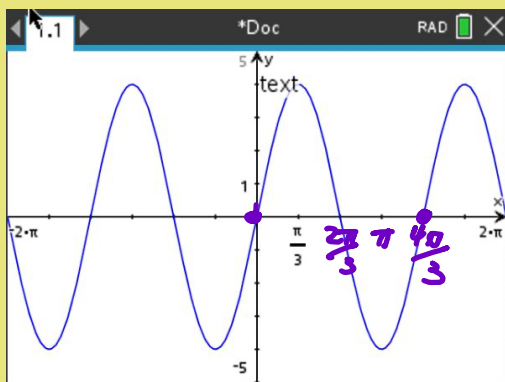0 4π 8π 12π 16π

amp 2 (−)

period $\dfrac{2\pi}{1/8} = 16\pi$

$16\pi \cdot \dfrac{1}{4} = 4\pi$

$$y = 4 \sin\left(\frac{3}{2}x\right)$$

$$-10$$
$$\dots 6$$
$$-2$$

$$\frac{10+2}{2} = 6$$

Amp
4

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

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

$$\boxed{b = \frac{2\pi}{period}} = \frac{2\pi}{\frac{4\pi}{3}} = 2\pi \cdot \frac{3}{\frac{4\pi}{2}} = \frac{3}{2}$$