

# GRAPHING TRIG FUNCTIONS

Periodic functions - repeat  
on regular intervals

Amplitude -

period -

\* Characteristics of  
trig graphs

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

\* Amplitude + period  
changes

$\sin x$  starts on axis + moves upward.

$\cos x$  starts at a peak + moves downward.

$$y = \sin x \quad \text{period } 2\pi$$

$$y = \sin(2x) \quad \frac{2\pi}{2} \quad \pi$$

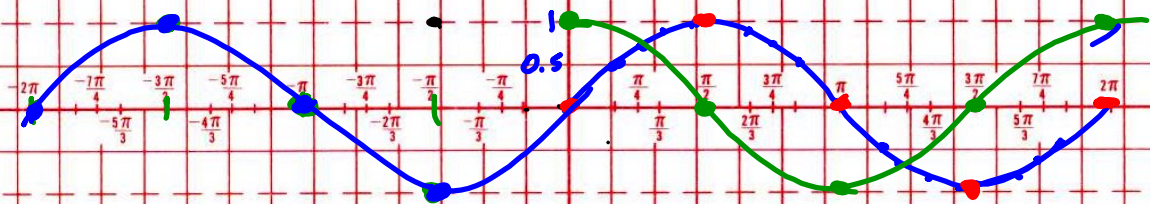
$$y = \sin(4x) \quad \frac{2\pi}{4} \quad \pi/2$$

$$y = \sin\left(\frac{1}{2}x\right) \quad \frac{2\pi}{\frac{1}{2}} \quad 4\pi$$

$$y = a \sin(bx + c) + d$$

$$\text{amp } |a|$$

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



$$y = \sin x$$

0	0
$\pi/6$	$1/2$
$\pi/4$	$\sqrt{2}/2 = 0.7$
$\pi/3$	$\sqrt{3}/2 \approx 0.866$
$\pi/2$	1

$\frac{1}{\sqrt{3}/2}$

Amplitude - height of wave from horiz. axis.

Normal: amp = 1

period - the length of one cycle of the graph

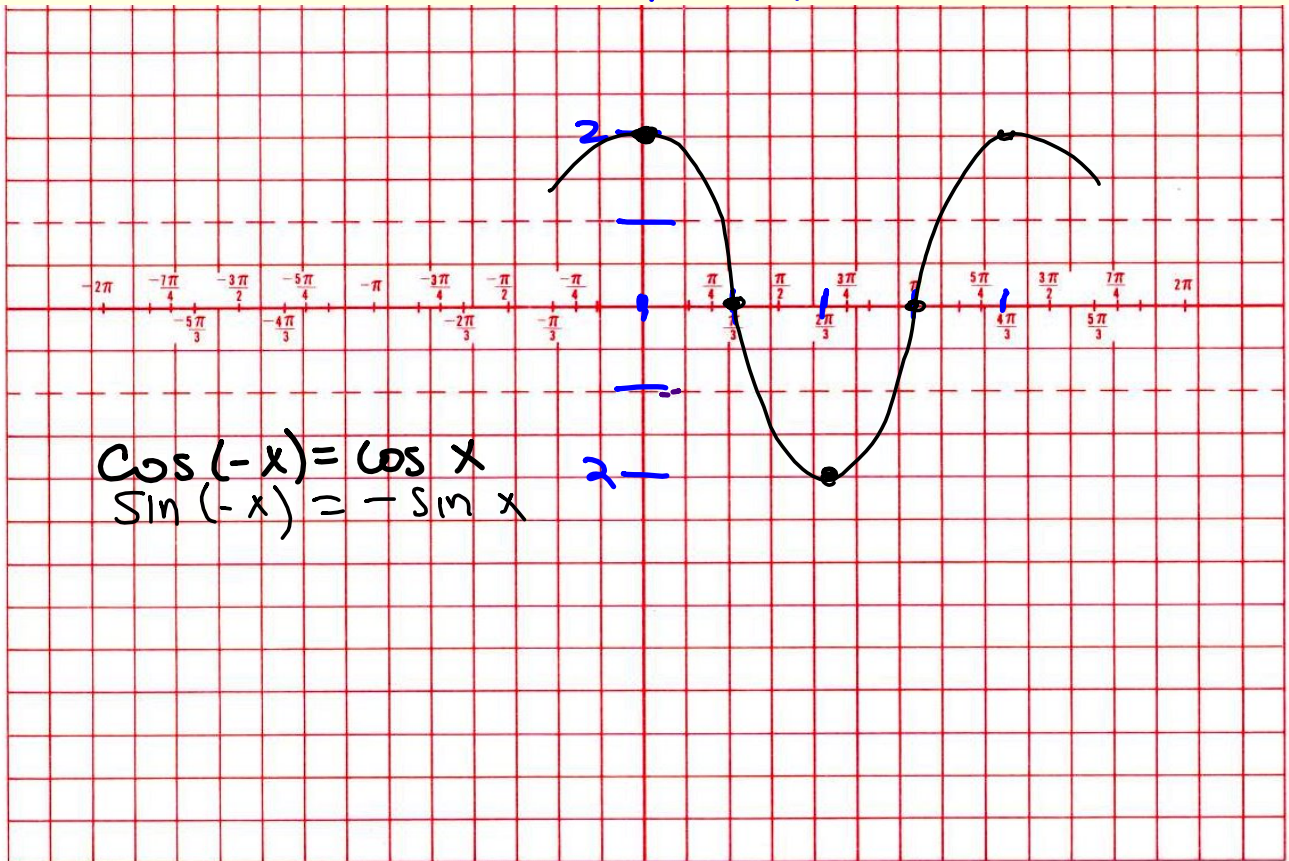
Normal: period =  $2\pi$

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

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

$$\frac{\text{amp}}{2} \quad \frac{\text{period}}{\frac{2\pi}{3/2} = 2\pi \cdot \frac{2}{3} = \frac{4\pi}{3}}$$

$$\frac{\text{Spacing}}{\text{period} \cdot \frac{1}{4}} = \frac{4\pi/3}{4} = \frac{\pi}{3}$$



$$\begin{aligned} \cos(-x) &= \cos x \\ \sin(-x) &= -\sin x \end{aligned}$$

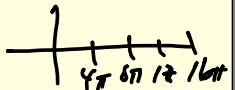
$$y = -3\sin\left(\frac{1}{8}x\right)$$

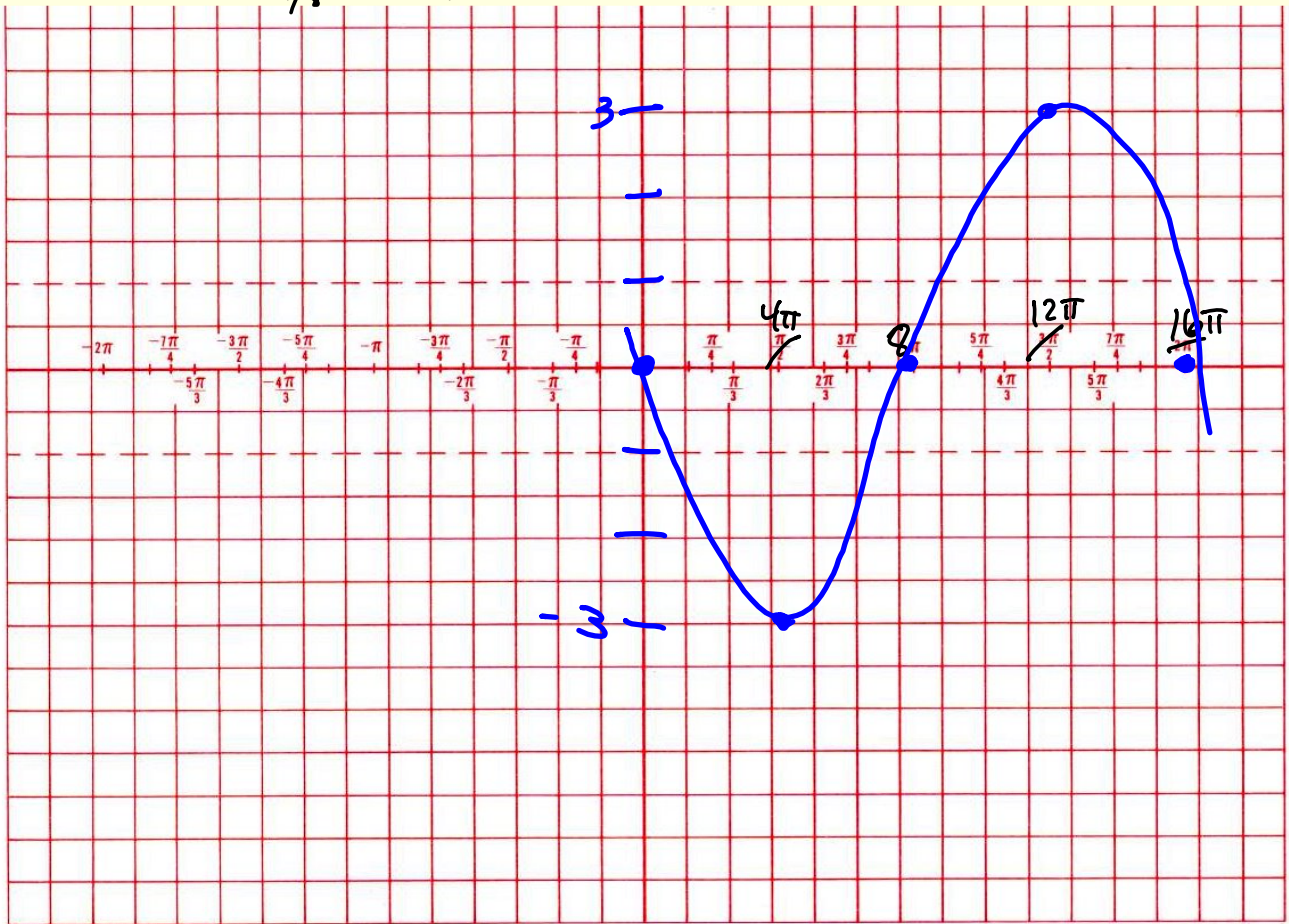
amp  
3 (-)

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

0     $4\pi$      $8\pi$      $12\pi$      $16\pi$

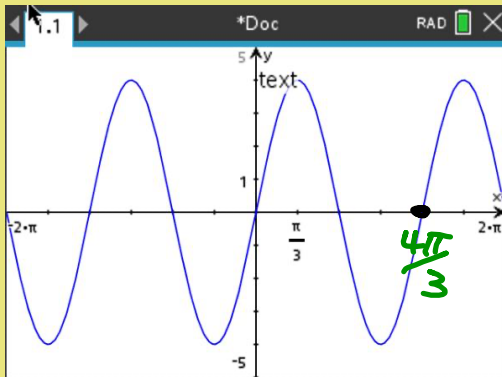
spacing:  $16\pi \cdot \frac{1}{4} = 4\pi$







sin



Write eq.      amp 4  
period  $\frac{4\pi}{3}$

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

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

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

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

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