

# GRAPHING TRIG FUNCTIONS

Periodic functions — repeat themselves on regular intervals

Amplitude — height of wave from x-axis  $\frac{\text{normal}}{\text{amp} = 1}$

period — the length of one cycle of the wave  $\frac{\text{normal period}}{2\pi}$

\* Characteristics of trig graphs

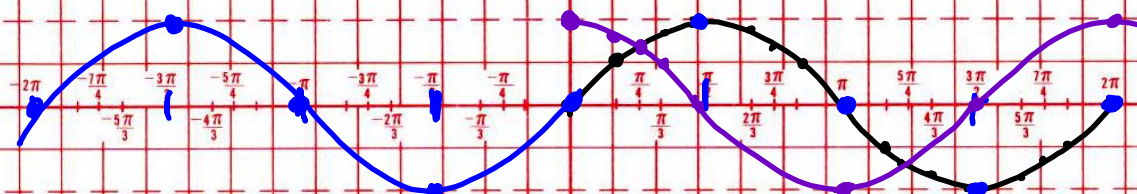
\* Graphs of  $\sin x$  &  $\cos x$

\* Amplitude & period changes

$\sin x$  starts on the axis & moves upward  
 $\cos x$  starts at a peak & moves downward

$$\begin{aligned} y &= 3 \sin x & \text{Amplitude} &= 3 \\ y &= \sin(2x) & \text{period} &= \pi & \frac{2\pi}{2} \\ y &= \sin\left(\frac{1}{2}x\right) & \text{period} &= 4\pi & \frac{2\pi}{1/2} \\ y &= \sin x & \text{period} &= 2\pi \\ y &= \sin(4x) & \text{per} &= \frac{2\pi}{4} = \frac{\pi}{2} \end{aligned}$$

$$\begin{aligned} y &= a \sin(bx) \\ \text{amplitude} &= |a| \\ \text{period} &= \frac{2\pi}{b} \end{aligned}$$



$$y = \sin x$$

0	0
$\frac{\pi}{6}$	$\frac{1}{2}$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2} \approx 0.7$
$\frac{\pi}{3}$	$\frac{\sqrt{3}}{2} \approx 0.86$
$\frac{\pi}{2}$	1

$$2 \sqrt{\frac{6.28}{3.14}}$$

$$y = \cos x$$

0	1
$\frac{\pi}{6}$	$\frac{\sqrt{3}}{2} \approx 0.86$
$\frac{\pi}{4}$	$\frac{\sqrt{2}}{2} \approx 0.7$
$\frac{\pi}{3}$	$\frac{1}{2}$
$\frac{\pi}{2}$	0

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

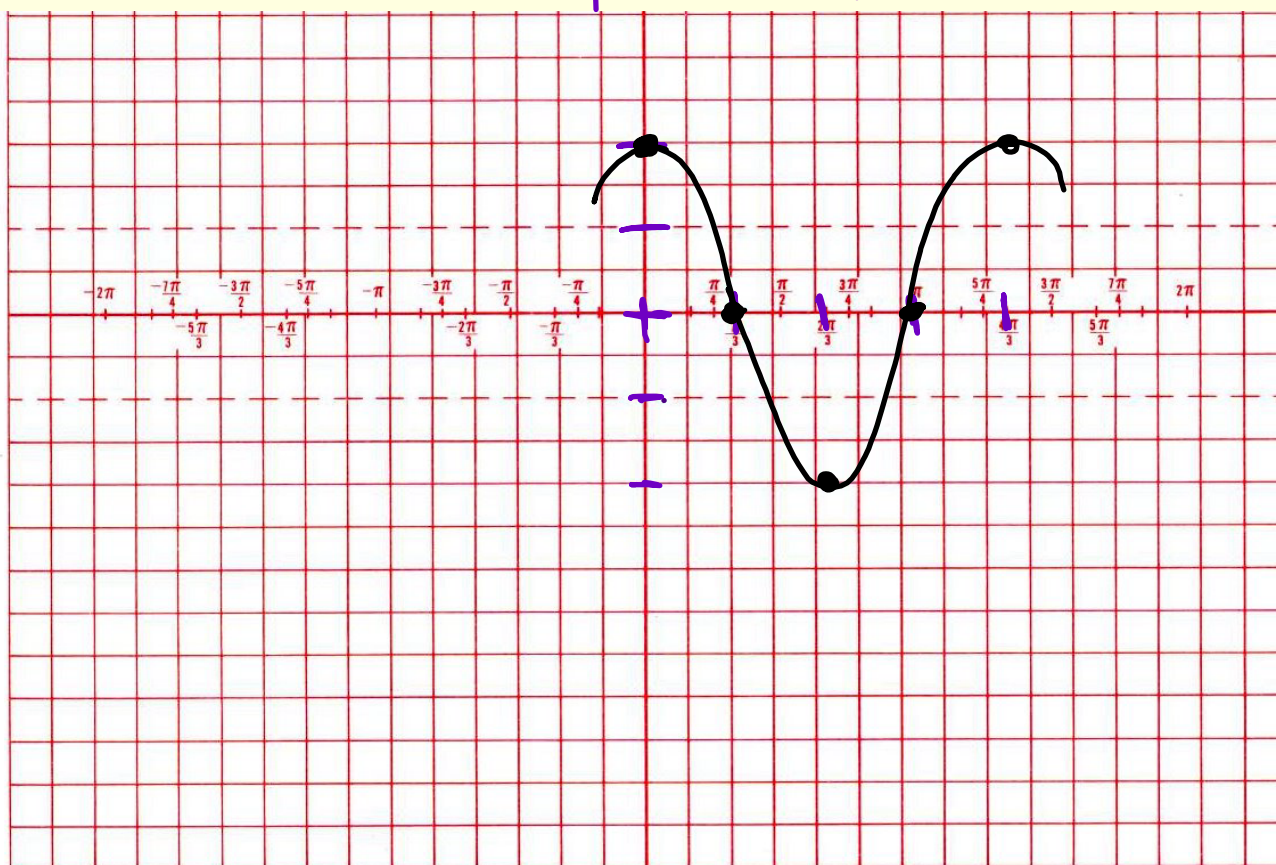
$$\text{amp} = 2$$

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

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

$$\text{period} \cdot \frac{1}{4}$$

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



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

$$\text{amp} = 2 (-)$$

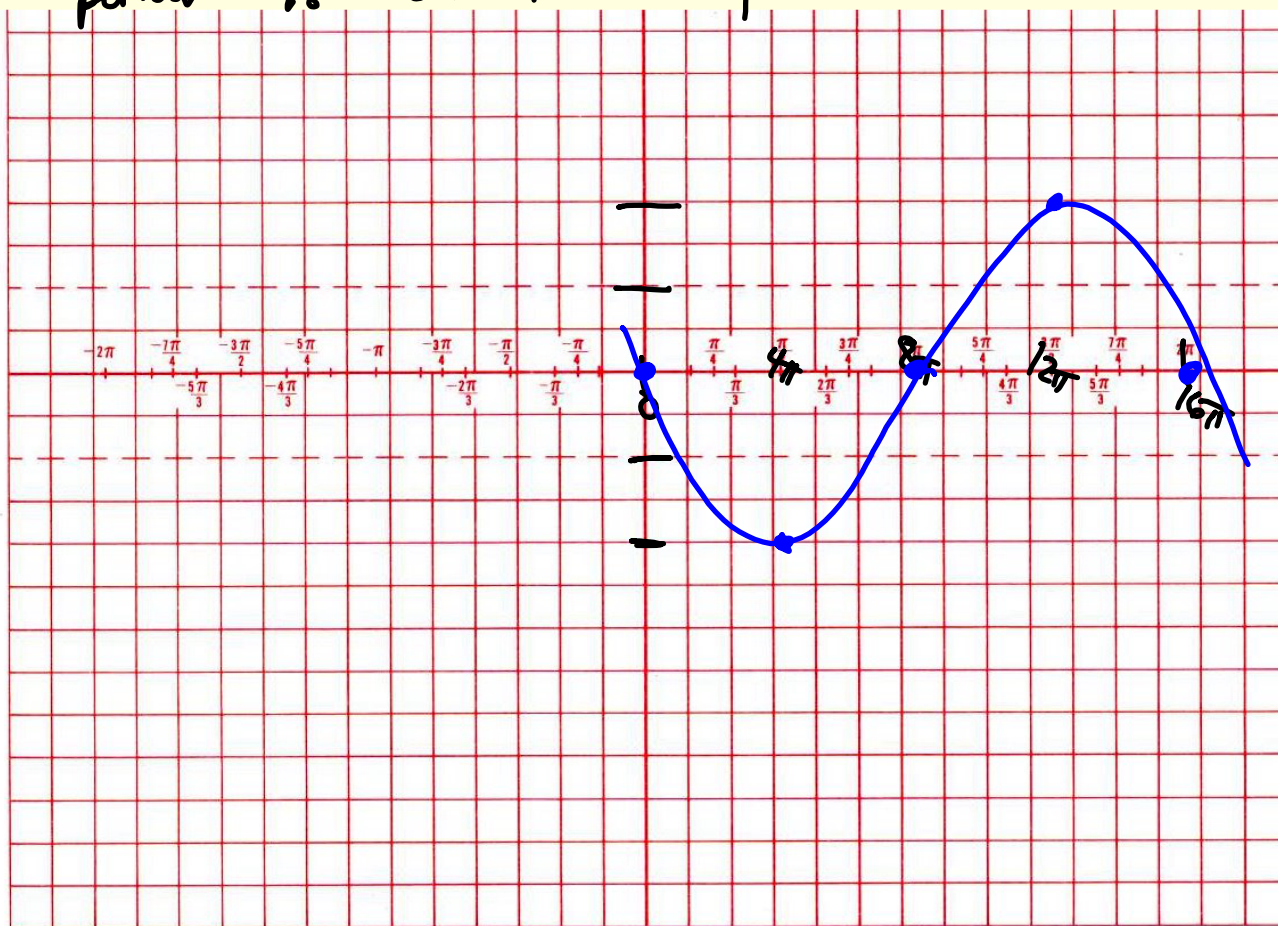
$$\text{period} = \frac{2\pi}{1/8} = 16\pi$$

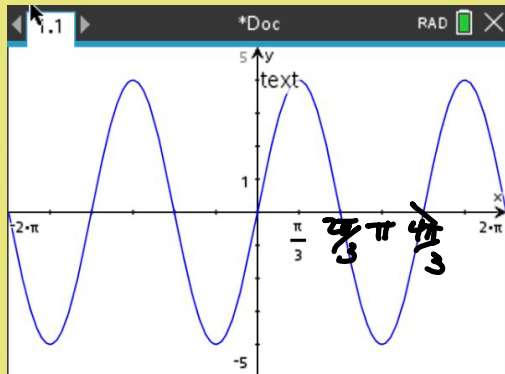
spacing

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

$$4\pi$$

$$\underline{0} \quad \underline{4\pi} \quad \underline{8\pi} \quad \underline{12\pi} \quad \underline{16\pi}$$





$$y = \sin x$$

$$\text{amp} = 4$$

$$\text{period} = \frac{4\pi}{3}$$

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

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

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

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

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