

When you're done, get on Desmos.

Set your axes to $-4\pi \rightarrow 4\pi$ for x Set x -axis to go
 $-2 \rightarrow 2$ for y by $\frac{\pi}{4}$.

Graph $y = \sin x$

$$y = \sin(3x)$$

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

Section 5.6 Sinusoidal Curves

Graph using period, phase shift, and amplitude
horizontal shift

$$y = a \sin(\omega x - \phi)$$

↑ greek letter "phi"

↑ greek letter "omega"

$$y = a \cos(\omega x - \phi)$$

$$\text{Amplitude} = |a|$$

$$\text{Period} = \frac{2\pi}{\omega}$$

$$\text{Phase Shift} = \frac{\phi}{\omega}$$

ex: $y = 3 \sin\left(\frac{\pi}{4}x\right)$

$a = 3$

$\text{Amp} = |3| = 3$

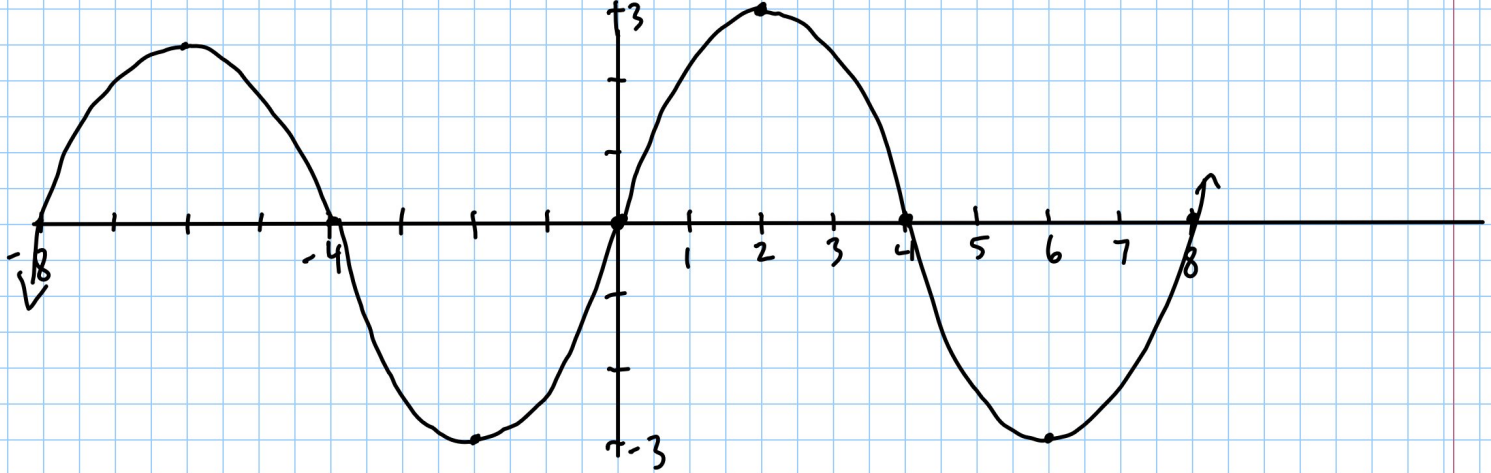
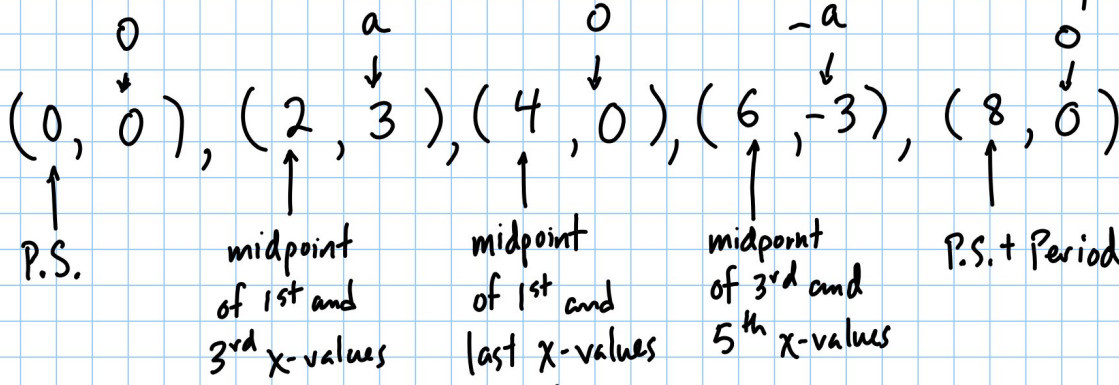
$y = 3 \sin\left(\frac{\pi}{4}x - 0\right)$

$\omega = \frac{\pi}{4}$

$\text{Period} = \frac{2\pi}{\frac{\pi}{4}} = \frac{2\pi \cdot 4}{\pi} = 8$

$\phi = 0$

$\text{P.S.} = \frac{0}{\frac{\pi}{4}} = 0$



ex: $y = -2 \cos\left(4x + \frac{\pi}{2}\right)$

$a = -2$

$\omega = 4$

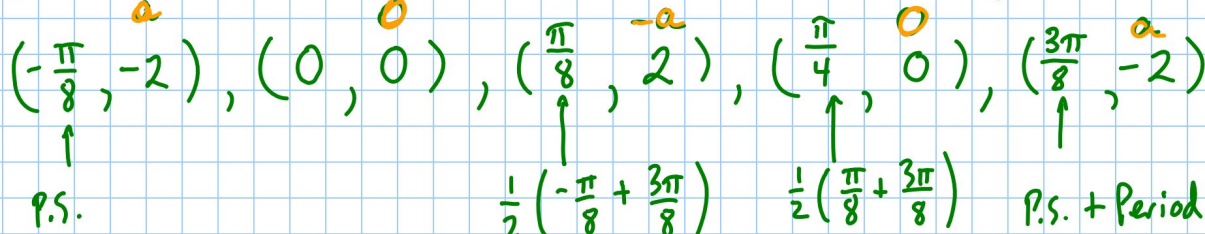
$\phi = -\frac{\pi}{2}$

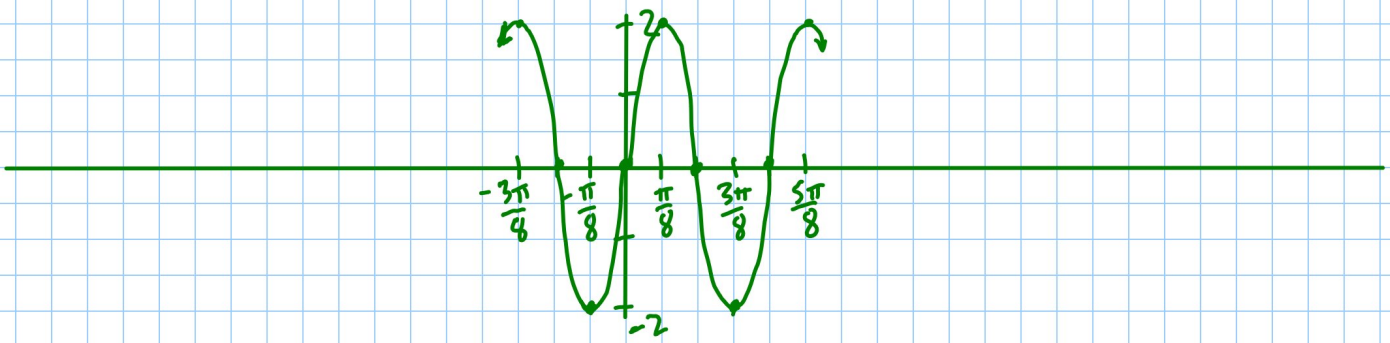
$\text{Amp} = |-2| = 2$

$\text{Period} = \frac{2\pi}{4} = \frac{\pi}{2}$

$\text{P.S.} = \frac{-\frac{\pi}{2}}{4} = -\frac{\pi}{2} \cdot \frac{1}{4} = -\frac{\pi}{8}$

For cosine





Find the 5 points for

$$y = -4 \cos(\pi x + 3\pi)$$

$$a = -4$$

$$\omega = \pi$$

$$\phi = -3\pi$$

$$\text{Amp} = 4$$

$$\text{Period} = \frac{2\pi}{\pi} = 2$$

$$\text{P.S.} = -\frac{3\pi}{\pi} = -3$$

$$(-3, -4), (-2.5, 0), (-2, 4), (-1.5, 0), (-1, -4)$$