

**4.3 - Graphing Sin/Cos Trig. Functions - Day 3****Warm - Up**

Find the unknowns first. Set up your x and y axis next. Then graph, in radians, **one complete cycle**.

$$y = -3 \sin \frac{4}{3} \theta$$

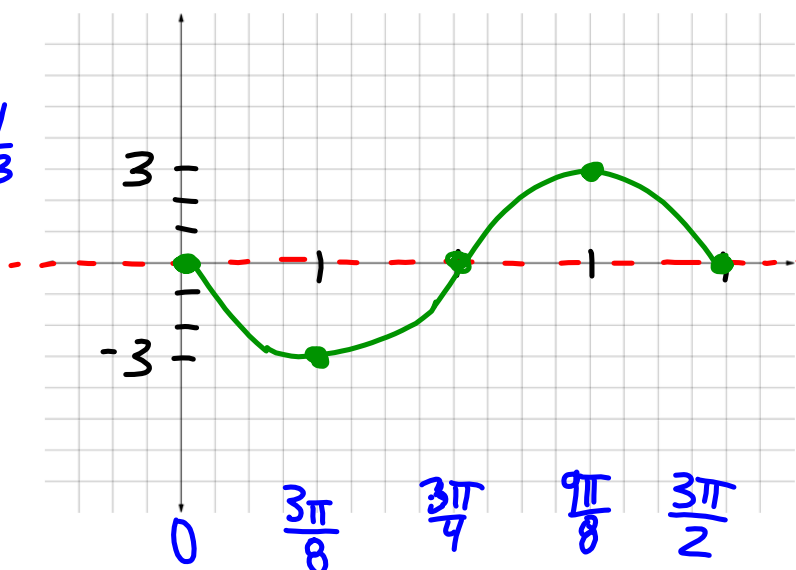
Amplitude = 3

Reflection?  Yes / No (circle one)

Period =  $\frac{3\pi}{2}$

Midline:  $y = 0$

$$b = \frac{4}{3}$$



Take note

### Concept Summary Families of Sine and Cosine Functions

#### Parent Function

$$y = \sin x$$

$$y = \cos x$$

#### Transformed Function

$$y = a \sin b(x - h) + k$$

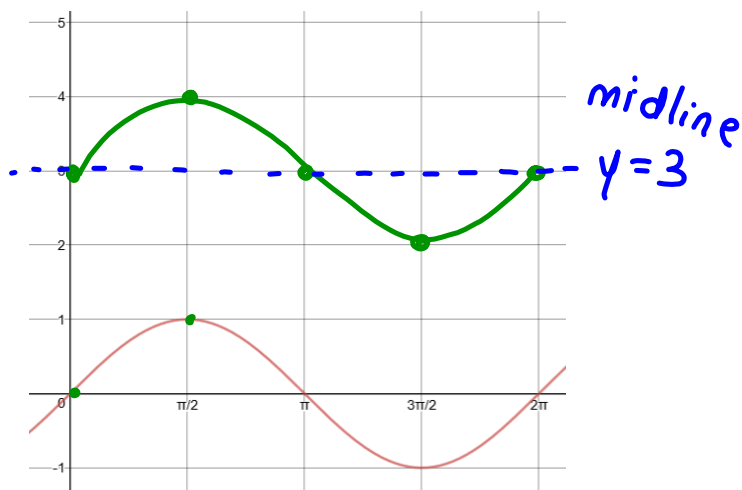
$$y = a \cos b(x - h) + k$$

- $|a|$  = amplitude (vertical stretch or shrink)
- $\frac{2\pi}{b}$  = period (when  $x$  is in radians and  $b > 0$ )
- $h$  = phase shift, or horizontal shift
- $k$  = vertical shift ( $y = k$  is the midline)

Only new thing for today!

$$\underline{y = \sin \theta} \quad \text{vs.} \quad y = \sin \theta + 3$$

Also, what is the equation of the midline of each ???



**Ex.1** Find the amplitude and period first. Set up the x and y axis next. Then graph, using radians, **one complete cycle**. Finally, state the midline equation.

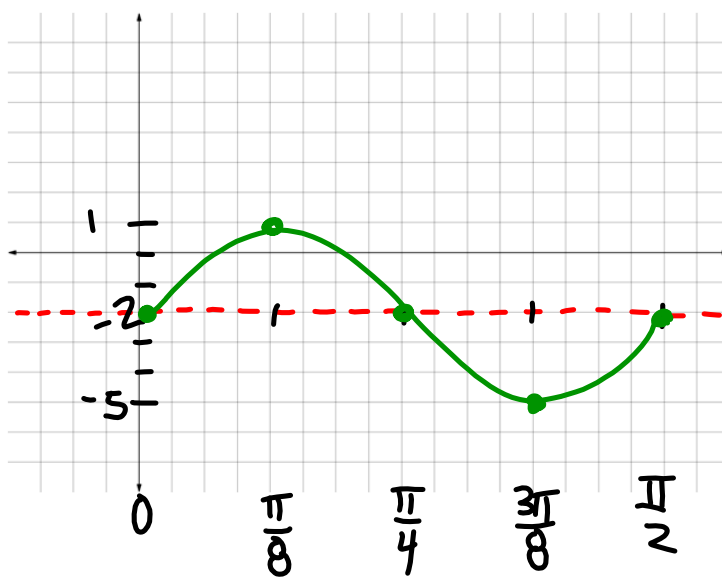
$$y = 3 \underline{\sin} 4\theta - 2$$

Amp: (3)

Reflect: (No)<sup>+</sup>

Period:  $\left(\frac{\pi}{2}\right) \leftarrow \frac{2\pi}{4}$

Midline:  $(y = -2)$



**Ex.2** Find the amplitude and period first. Set up the x and y axis next. Then graph, using radians, **one complete cycle**. Finally, state the midline equation.

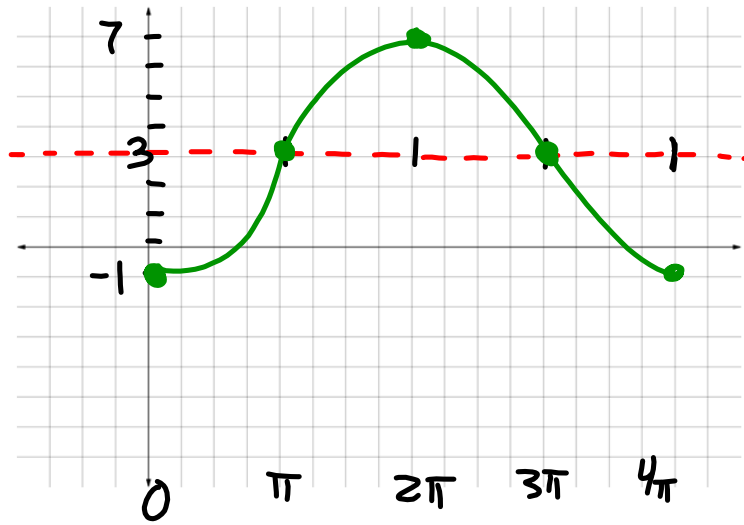
$$y = -4 \cos \frac{\theta}{2} + 3$$

Amp: 4

Reflect?: Yes

Period:  $4\pi \leftarrow \frac{2\pi}{\frac{1}{2}}$

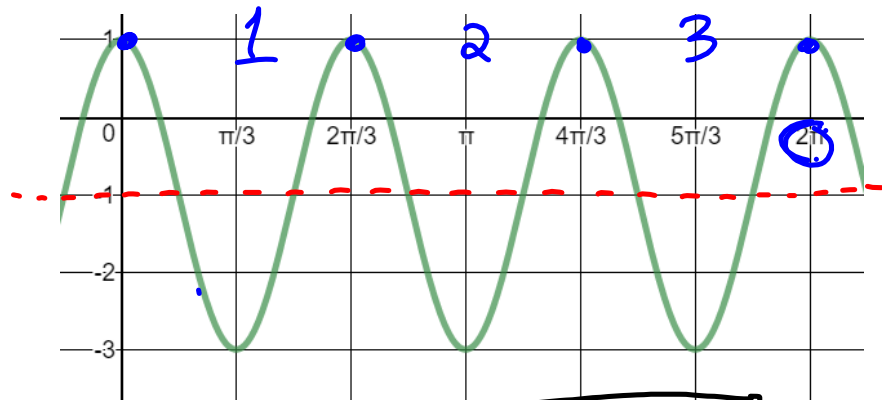
Midline:  $y = 3$



General Forms:  $y = a \sin b\theta + k$        $y = a \cos b\theta + k$

**Ex.3** Given the graph... Find the unknowns... Write the function.

Sine or Cosine?  
(circle one)



a - value: 2,      b-value: 3,  
k - value: -1

Function:  $y = 2 \cos 3\theta - 1$

General Forms:  $y = a \sin b\theta + k$        $y = a \cos b\theta + k$

**Ex.4** Given the graph... Find the unknowns... Write the function.

**Sine** or Cosine?  
(circle one)

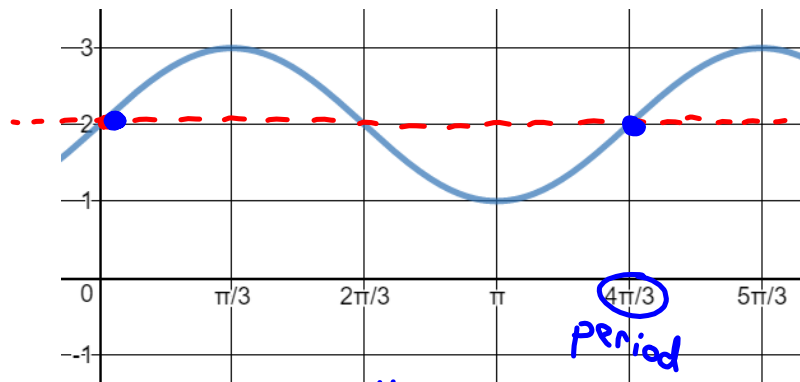
a - value: 1,

b-value:  $\frac{3}{2}$ ,

k - value: 2

Function:

$$y = \sin \frac{3\theta}{2} + 2$$



$$\frac{2\pi}{B} = \frac{4\pi}{3}$$

$$4\pi \cdot B = 6\pi$$

$$B = \frac{3}{2}$$