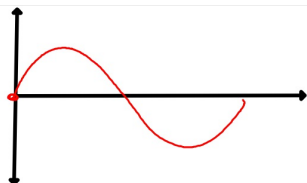


The Parent $\sin\theta$ function:



Period = 2π Amplitude = 1 Midline: $y = 0$
 Max = 1 at $\theta = \frac{\pi}{2}$ x-int at $\theta = 0, \pi, 2\pi$ Domain: $(-\infty, \infty)$
 Min = -1 at $\theta = \frac{3\pi}{2}$ y-int when $\theta = 0$ Range: $[-1, 1]$

$$y = a \sin bx$$

$|a|$ = Amplitude (also called a Vertical Stretch/Shrink Factor)

When $a < 0$ there is an x-axis reflection (upside down)

b : \longrightarrow Period = $\frac{2\pi}{b}$

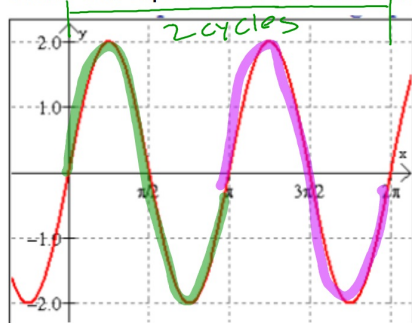
If you can take a Sine equation and graph it, what else should you be able to do?

Take a Sine graph and write its equation!

From the graph you can find the period and then turn this in to the coefficient b used in the equation.

$$\text{Period} = \frac{2\pi}{b} \xrightarrow[\text{becomes}]{\text{solved for } b} b = \frac{2\pi}{\text{Period}}$$

Write the equation of this sine function.



How many cycles are there from 0 to 2π ? 2
 $b = \# \text{ of cycles in } 2\pi$
 $b = 2$

$$y = a \sin bx$$

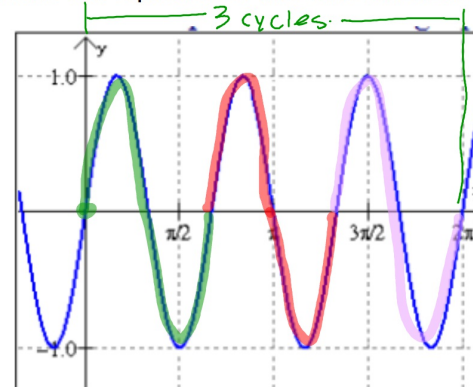
Amplitude = 2 $a = +2$

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

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

$$y = 2 \sin 2x$$

Write the equation of this sine function.



$$y = a \sin bx$$

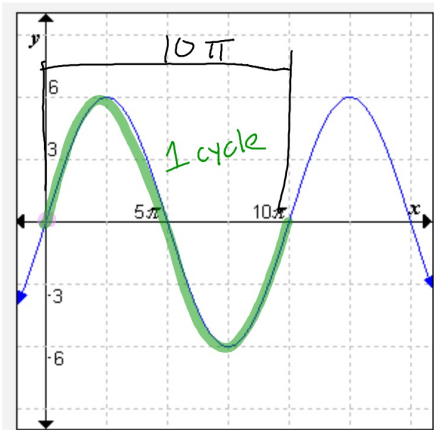
Amplitude = 1
 $a = +1$

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

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

$$\text{EQ: } y = \sin 3x$$

Write the equation of this sine function.



$$y = a \sin bx$$

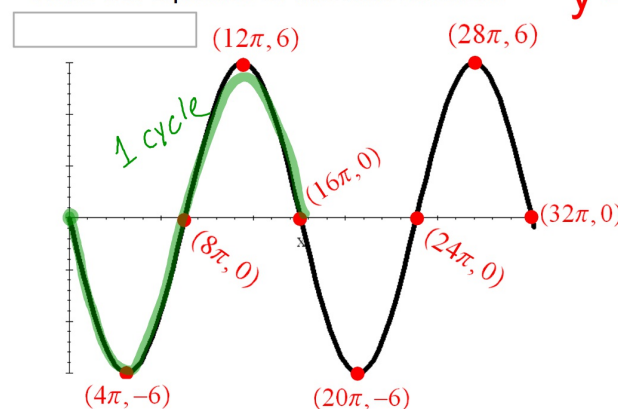
Amplitude = 6
 $a = +6$

Period = $\frac{10\pi}{1} = 10\pi$

$$b = \frac{2\pi}{10\pi} = \frac{1}{5}$$

$$\text{EQ: } y = 6 \sin \frac{x}{5}$$

Write the equation of this sine function.



$$y = a \sin bx$$

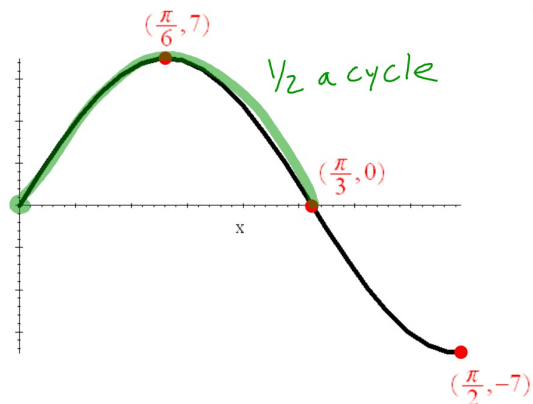
Amplitude = 6
 $a = -6$

Period = $\frac{16\pi}{1} = 16\pi$

$$b = \frac{2\pi}{16\pi} = \frac{1}{8}$$

$$\text{EQ: } y = -6 \sin \frac{x}{8}$$

Write the equation of this sine function.



$$y = a \sin bx$$

Amplitude = 7
 $a = +7$

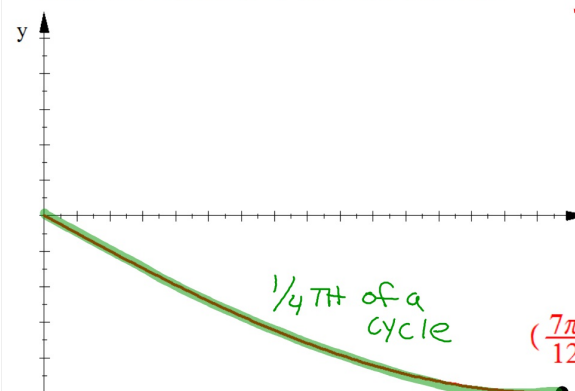
Period = $\frac{\pi}{3} = \frac{\pi}{3} \cdot \frac{2}{1}$
 $\frac{1}{2}$

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

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

EQ: $y = 7 \sin 3x$

Write the equation of this sine function.



$$y = a \sin bx$$

Amplitude = 5
 $a = -5$

Period = $\frac{7\pi}{12} \cdot \frac{4}{1}$

$\frac{7\pi}{12} \cdot 4 = \frac{7\pi}{3}$

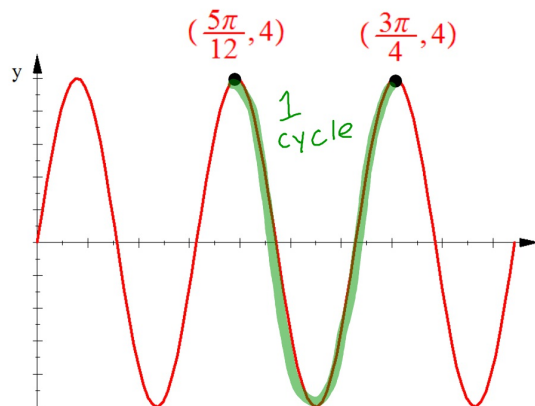
$b = \frac{2\pi}{\frac{7\pi}{3}} = 2\pi \cdot \frac{3}{7\pi}$

$b = \frac{6}{7}$

EQ:

$y = -5 \sin \frac{6x}{7}$

Write the equation of this sine function.



$$y = a \sin bx$$

Amplitude = 4
 $a = 4$

Period = $\frac{3\pi}{4} - \frac{5\pi}{12}$
 1

$= \frac{9\pi}{12} - \frac{5\pi}{12}$
 $= \frac{4\pi}{12} = \frac{\pi}{3}$

$b = \frac{2\pi}{\frac{\pi}{3}} = 2\pi \cdot \frac{3}{\pi}$
 $b = 6$

EQ: $y = 4 \sin 6x$

You can now finish Hwk #8

Sec 13-4

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Problems 13, 14, 22, 23, 27, 29-32, 42

Due Tomorrow

for #'s 22, 23, 27 label the coordinates of ALL Max's, Min's, and x-int