Using $y = a\sin bx$

1. To find find the value of a on a given graph all you need to know is the amplitude.

2. If the cycle in your graph starts on the midline and goes up to a maximum a is Positive

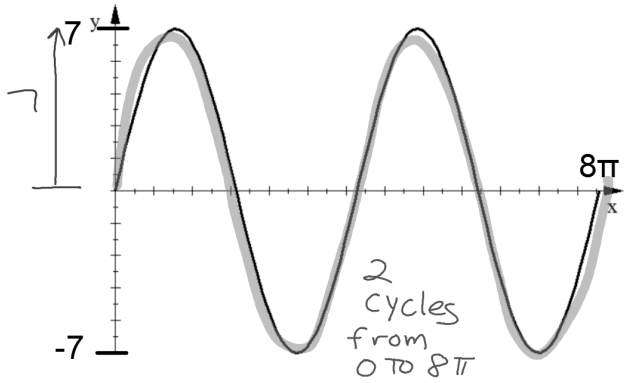
3. If the cycle in your graph starts on the midline and goes down to a minimum a is Negative

Using $y = a\sin bx$ Period $= \frac{2\pi}{b}$

Solving for b you get: $b = \frac{2\pi}{\text{Period}}$

Therefore, to find the value of b given a graph all you need to know is the period.

What is the value of a and b for this Sine graph?



amplitude = 7
not upside down

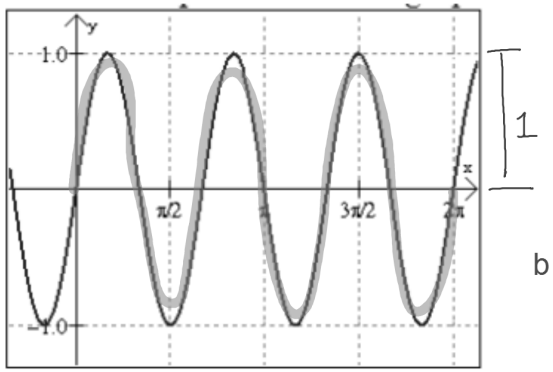
$a = 7$

period $= \frac{8\pi}{2} = 4\pi$

$b = \frac{2\pi}{4\pi} = \frac{1}{2}$

Write the equation of this sine graph. $y = 7\sin\frac{1}{2}x$ or $7\sin\frac{x}{2}$

What is the value of a and b for this Sine graph?



amplitude = 1
not upside down

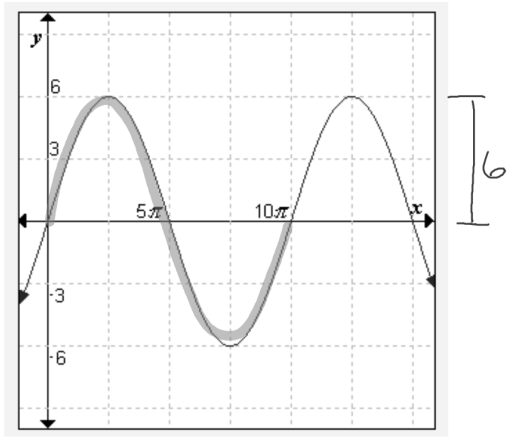
$a = 1$

3 cycles from 0 to 2π
period $= 2\pi/3$

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

Write the equation of this sine graph. $y = 1\sin 3x$ or $\sin 3x$

What is the value of a and b for this Sine graph?



amplitude = 6
not upside down

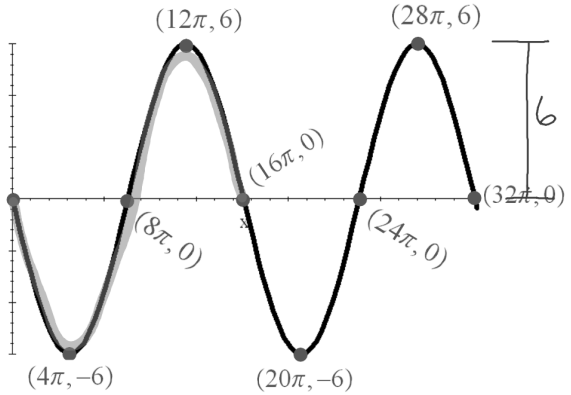
a = 6

one cycle from
0 to 10π
period = 10π

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

Write the equation of this sine graph. $y = 6 \sin \frac{1}{5}x$ or $6 \sin \frac{x}{5}$

What is the value of a and b for this Sine graph?



amplitude = 6
upside down

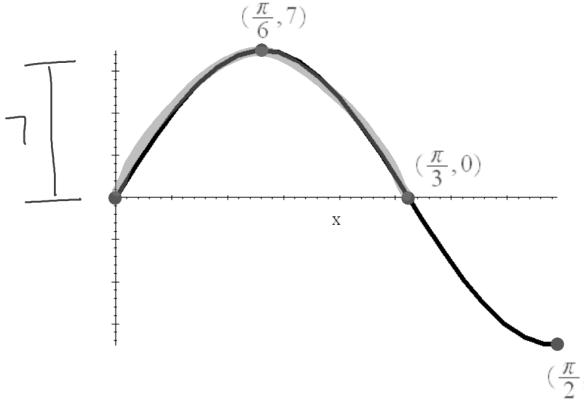
a = −6

one cycle from
0 to 16π
period = 16π

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

Write the equation of this sine graph. $y = -6 \sin \frac{1}{8}x$ or $-6 \sin \frac{x}{8}$

What is the value of a and b for this Sine graph?



amplitude = 7
NOT upside down

a = 7

0 to $\frac{\pi}{3}$ is $\frac{1}{2}$ cycle

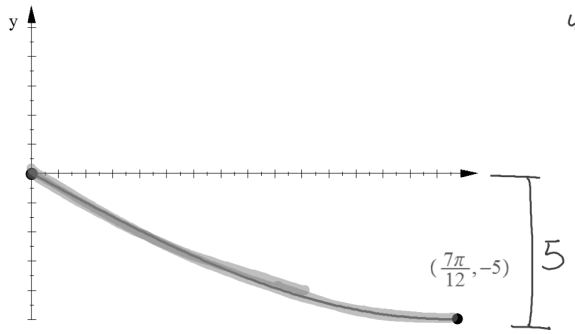
$\text{period} = \frac{\frac{\pi}{3}}{\frac{1}{2}} = \frac{\pi}{3} \cdot 2 = \frac{2\pi}{3}$

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

b = 3

Write the equation of this sine graph. $y = 7 \sin 3x$

What is the value of a and b for this Sine graph?



amplitude = 5
upside down

a = −5

$\frac{1}{4}$ cycle from
0 to $\frac{7\pi}{12}$

$\text{Period} = \frac{\frac{7\pi}{12}}{\frac{1}{4}} = \frac{7\pi}{12} \cdot \frac{4}{1} = \frac{7\pi}{3}$

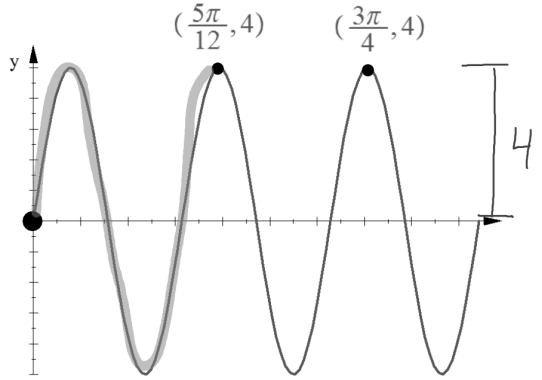
$b = \frac{2\pi}{\frac{7\pi}{3}} = 2\pi \cdot \frac{3}{7\pi}$

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

Write the equation of this sine graph.

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

What is the value of a and b for this Sine graph?



amplitude = 4
not upside down

a = 4

1¼ cycles from 0 to $\frac{5\pi}{12}$

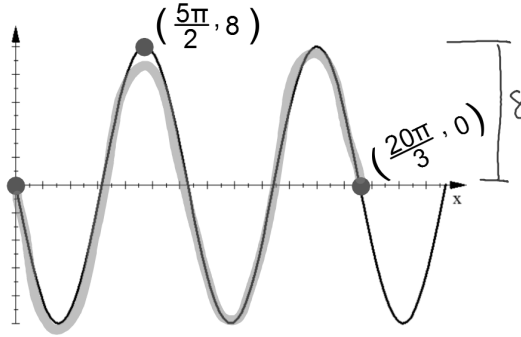
period = $\frac{\frac{5\pi}{12}}{\frac{5}{4}} = \frac{5\pi}{12} \cdot \frac{4}{5}$

period = $\pi/3$

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

Write the equation of this sine graph. $y = 4 \sin 6x$

What is the value of a and b for this Sine graph?



Amplitude = 8
upside down

a = −8

2 cycles from 0 to $\frac{20\pi}{3}$

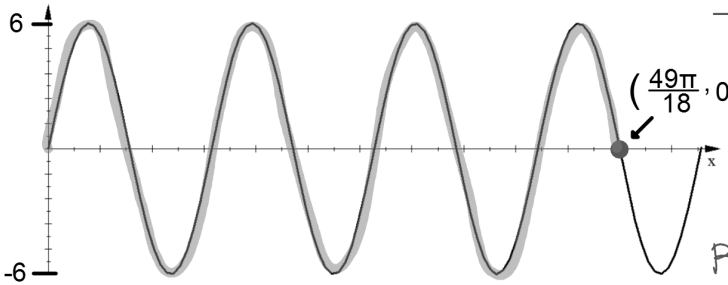
period = $\frac{\frac{20\pi}{3}}{2} = \frac{20\pi}{3} \cdot \frac{1}{2} = \frac{10\pi}{3}$

$b = \frac{2\pi}{\frac{10\pi}{3}} = 2\pi \cdot \frac{3}{10\pi} = \frac{3}{5}$

Write the equation of this sine graph.

$y = -8 \sin \frac{3}{5}x$
or $-8 \sin \frac{3x}{5}$

What is the value of a and b for this Sine graph?



Amplitude = 6
NOT upside down

a = 6

3½ cycles from 0 to $\frac{49\pi}{18}$

period = $\frac{\frac{49\pi}{18}}{\frac{7}{2}}$

$= \frac{49\pi}{18} \cdot \frac{2}{7} = \frac{7\pi}{9}$

$b = \frac{2\pi}{\frac{7\pi}{9}} = 2\pi \cdot \frac{9}{7\pi}$

$b = \frac{18}{7}$

Write the equation of this sine graph.

$y = 6 \sin \frac{18}{7}x$
or $6 \sin \frac{18x}{7}$

You can now finish Hwk #18 Sec 13-4

Page 738

Problems 13, 14, 22, 23, 27, 31, 32, 42

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