

For 1-3 write the equation of each transformed Sine function in the form: $y = a \sin bx$

1. Graph is 13 times taller, there is an x-axis reflection, and the period =
- $\frac{5\pi}{6}$

$$a = -13$$

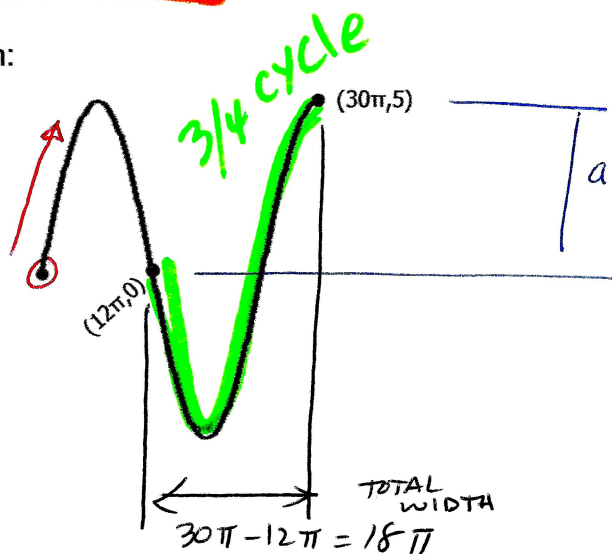
EQ:

$$y = -13 \sin \frac{12x}{5}$$

$$b = \frac{2\pi}{\frac{5\pi}{6}} = 2\pi \cdot \frac{6}{5\pi} = \frac{12}{5}$$

$$b = 12/5$$

2. Use this graph:



amplitude = $5 - 0 = 5$
 graph starts on midline and goes up so a is pos.

$$a = +5$$

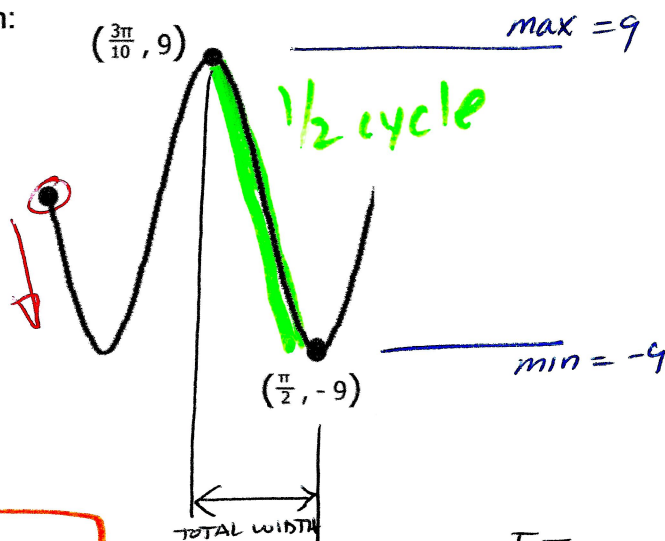
EQ:

$$y = 5 \sin \frac{x}{12}$$

$$\text{period} = \frac{18\pi}{3/4} = 18\pi \cdot \frac{4}{3} = 24\pi$$

$$b = \frac{2\pi}{24\pi} = \frac{1}{12}$$

3. Use this graph:



$$\text{amplitude} = \frac{9 - (-9)}{2} = \frac{18}{2} = 9$$

graph starts on the midline and goes down so a is neg.

$$a = -9$$

EQ:

$$y = -9 \sin 5x$$

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

$$\text{period} = \frac{\frac{\pi}{5}}{1/2} = \frac{\pi}{5} \cdot \frac{2}{1} = \frac{2\pi}{5}$$

$$b = \frac{2\pi}{2\pi/5} = 2\pi \cdot \frac{5}{2\pi} = 5$$

For the remaining problems write the equation of the transformed Sine functions in $y = a \sin bx + k$ form.

4. Half as tall, period = $\frac{2\pi}{3}$, and equation of the midline is $y = -4$.

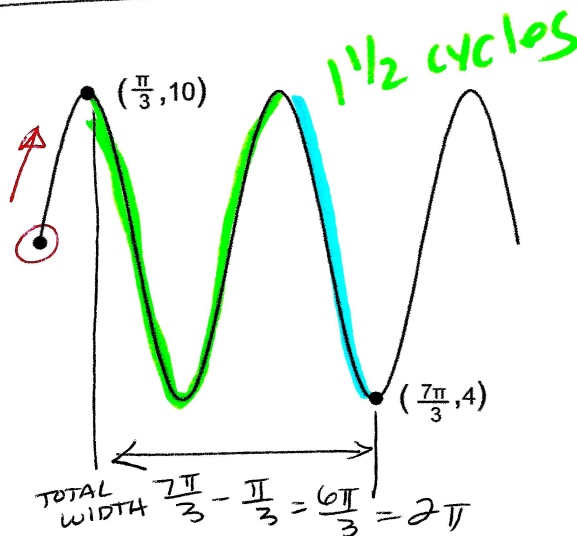
EQ: $a = \frac{1}{2}$ $b = \frac{2\pi}{\frac{2\pi}{3}} = 2\pi \cdot \frac{3}{2\pi} = 3$

$k = -4$

$b = 3$

$y = \frac{1}{2} \sin 3x - 4$

5. Use this graph:



$\text{max} = 10$ $\text{min} = 4$

$\text{Amp} = \frac{10 - 4}{2} = \frac{6}{2} = 3$

graph starts on midline and goes up so a is pos.

$a = 3$

midline $y = \frac{10 + 4}{2} = \frac{14}{2} = 7$

$k = 7$

EQ:

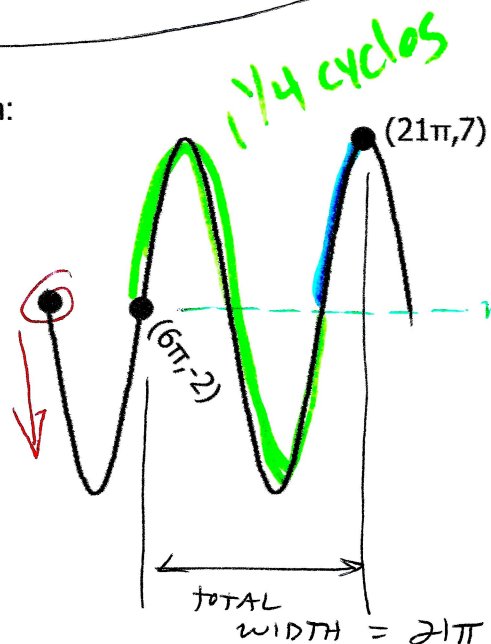
$y = 3 \sin \frac{3x}{2} + 7$

period = $\frac{2\pi}{1\frac{1}{2}} = \frac{2\pi}{3/2} = 2\pi \cdot \frac{2}{3} = \frac{4\pi}{3}$

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

$b = 3/2$

6. Use this graph:



$\text{Amp} = \text{max} - \text{midline} = 7 - (-2) = 9$

graph starts on midline and goes down $\rightarrow a$ is neg

$a = -9$

midline $y = -2$ $k = -2$

EQ:

$y = -9 \sin \frac{x}{6} - 2$

period = $\frac{15\pi}{1\frac{1}{4}} = \frac{15\pi}{5/4} = 15\pi \cdot \frac{4}{5} = 12\pi$

$b = \frac{2\pi}{12\pi} = \frac{1}{6}$ $b = 1/6$