

LT: Write the equation of the sine/cosine graph

Ex 1) Write the equation of the graph below:

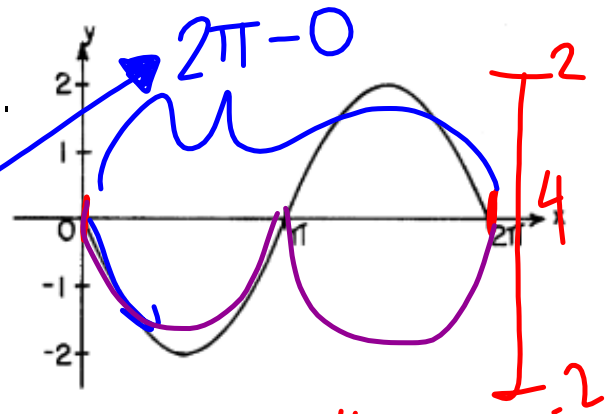
a) Determine Amp/Period.

Amp: 2 / Per: 2π

b) Write in equation form.

$$f(x) = -2\sin(1x)$$

Neg



$$2 - (-2) = 4$$

$$b \cdot 2\pi = \frac{2\pi}{b} \cdot b \quad \text{Per} = \frac{2\pi}{b}$$

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

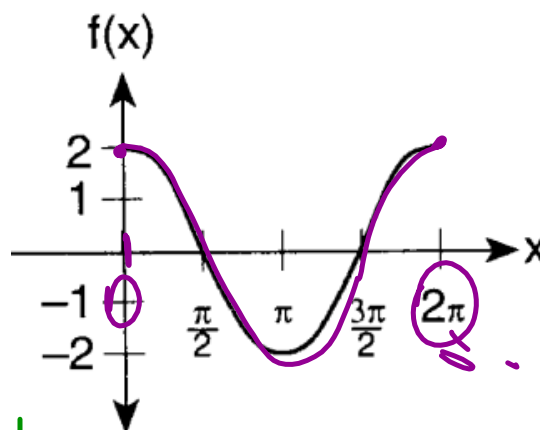
Ex 2) Write the equation of the graph below:

a) Determine Amp/Period.

Amp: 2 , Per: 2π

b) Write in equation form.

$$f(x) = 2\cos(x)$$



Ex 3) Write the equation of the graph below:

a) Determine Amp/Period.

$$\text{Amp: } \frac{1}{2} / \text{Per: } \pi$$

b) Write in equation form.

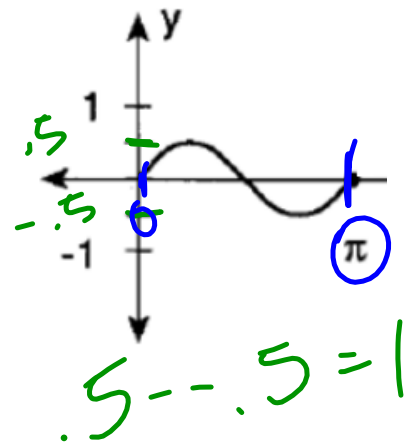
$$f(x) = \frac{1}{2} \sin(2x)$$

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

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

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

$$b = 2$$



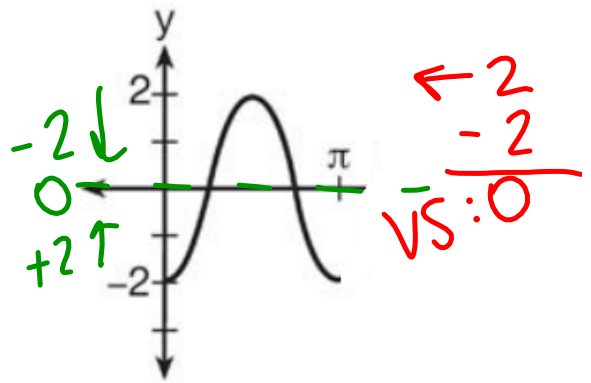
Ex 4) Write the equation of the graph below:

a) Determine Amp/Period.

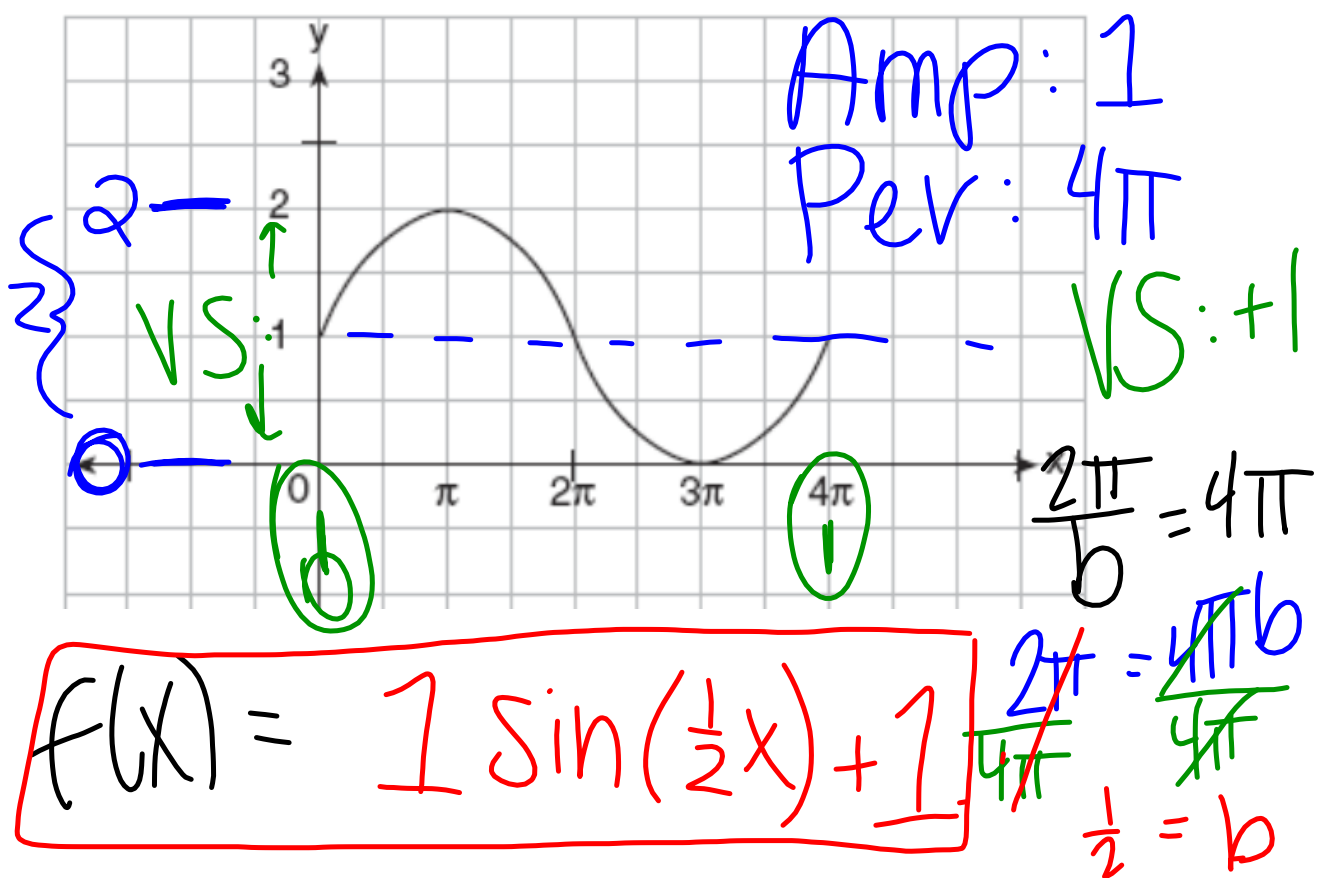
Amp: 2 / Per: π

b) Write in equation form.

$$f(x) = -2\cos(2x)$$



Ex 5) Write the equation of the graph.



Ex 6) Write a cosine AND sine equation for this graph.

Amp: 5

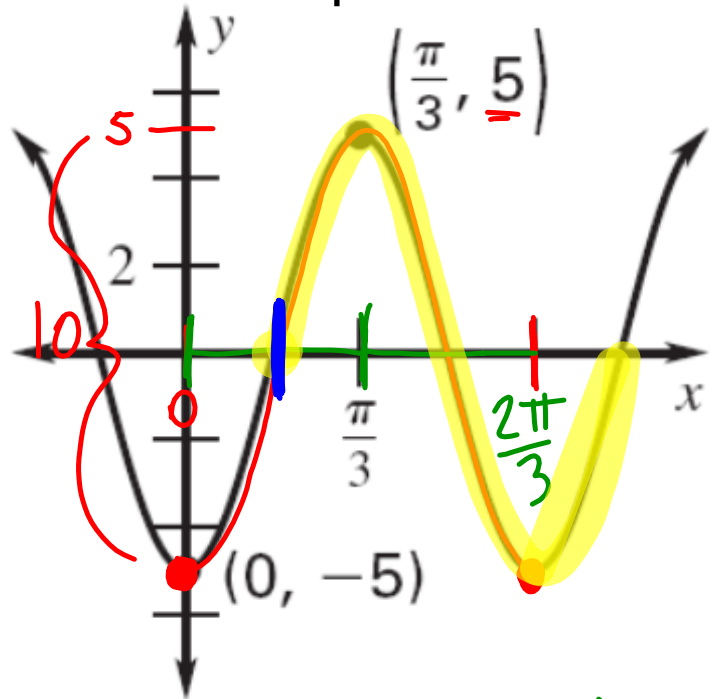
Per: $\frac{2\pi}{3}$

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

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

~~$2\pi b = \frac{6\pi}{2\pi}$~~

$b = 3$



$f(x) = -5\cos(3x)$

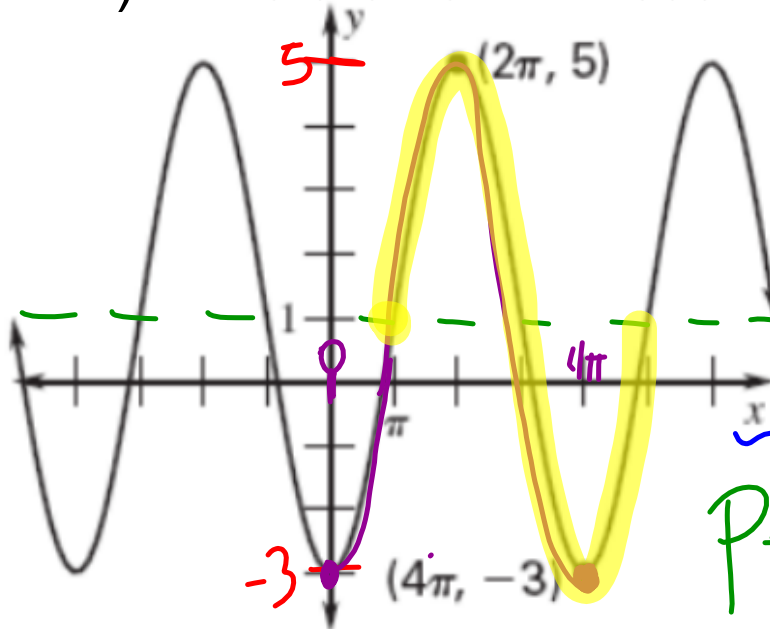
$\frac{\pi}{3} \cdot \frac{1}{2} = \frac{\pi}{6}$ * sine starting point

$b(x - SP)$
 $3(x - \frac{\pi}{6})$

$f(x) = 5\sin(3x - \frac{\pi}{2})$

$(3x - \frac{3\pi}{6})$

Ex 7) Write a sine AND cosine equation



$$\text{Amp} = \frac{5 - (-3)}{2} = 4$$

$$\text{Per} = 4\pi - 0 = 4\pi$$

$$\text{VS} = 5 - 4 = 1$$

$$\text{Per.} = \frac{2\pi}{b}$$

$$f(x) = -4\cos\left(\frac{1}{2}x\right) + 1$$

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

$$\text{S.P.} = \pi$$

$$\frac{1}{2}(x - \pi)$$

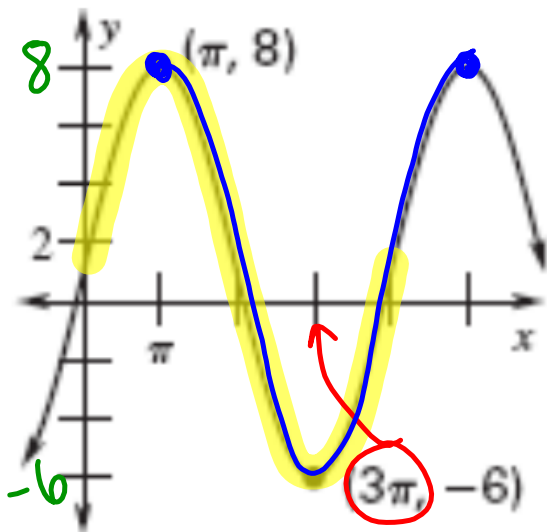
$$\frac{\pi}{1} \cdot \frac{1}{2}$$

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

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

$$f(x) = 4\sin\left(\frac{1}{2}x - \frac{\pi}{2}\right) + 1$$

Ex 8) Write a cosine AND sine equation



$$\text{Amp} = \frac{8 - (-6)}{2} = \frac{14}{2} = 7$$

$$\text{Per} = 4\pi - 0 = 4\pi$$

$$\text{VS} = 8 - 7 = +1$$

Read
the
graph

Write eqn:

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

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

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

$$f(x) = 7\sin\left(\frac{1}{2}x\right) + 1$$

Now for Cosine... Find the Starting Point (SP)

$$\frac{1}{2}(x - \pi) \rightarrow \left(\frac{1}{2}x - \frac{\pi}{2}\right)$$

$$f(x) = 7\cos\left(\frac{1}{2}x - \frac{\pi}{2}\right) + 1$$