

Key

# Graphing Trig Functions Day 3- Phase Shift!

$Y = a \sin(b(x - h)) + k$   $h$  is the phase shift! Just as in other functions, this shifts the graph horizontally  $h$  units!

A.  $y = \sin(x - \pi/3)$

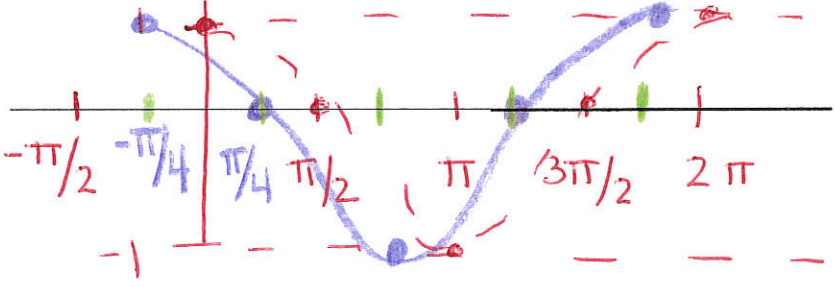


$C = \pi/3$   
P.S  $\pi/3$  RT  $\rightarrow$  create  $\pi/12$   $\pi/3 =$

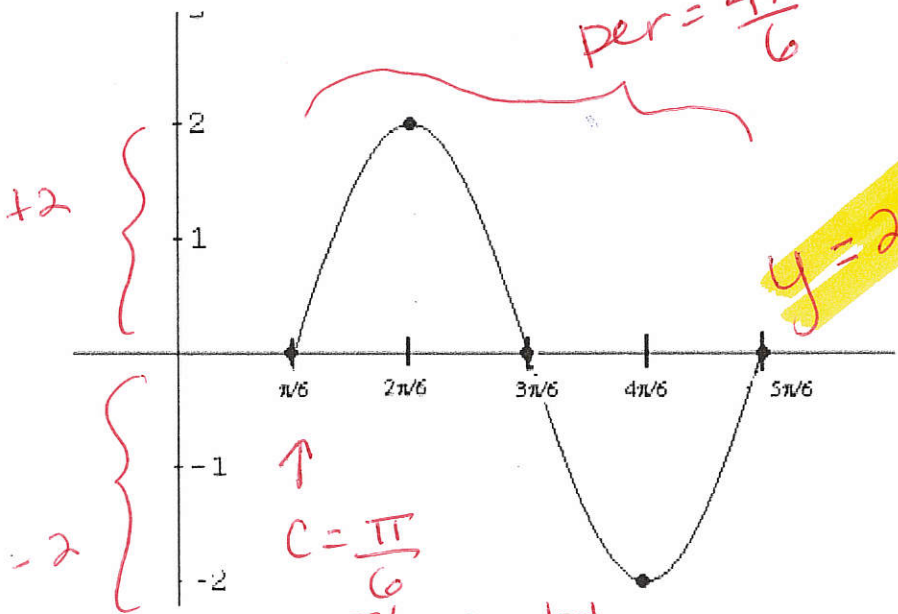
B.  $y = \cos(x + \pi/4)$

$C = -\pi/4$

PS =  $\pi/4$  left



C. Find the equation of the graph



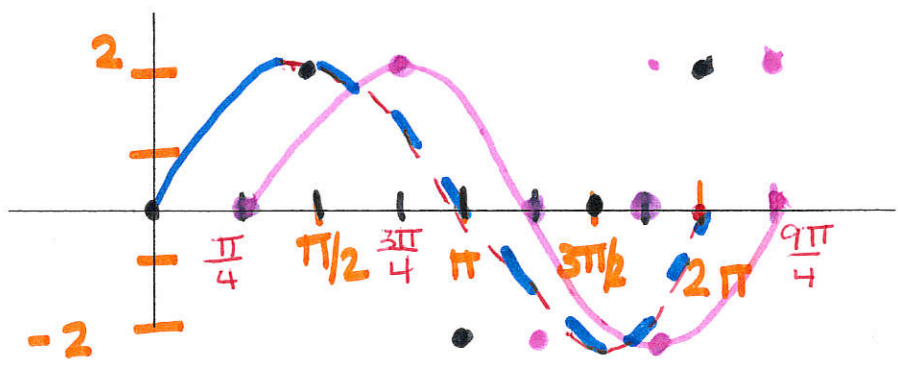
per =  $\frac{4\pi}{6}$

$y = 2 \sin[3(x - \pi/6)]$   
 $d = 0$

$a = 2$   
pos sin  
 $C = \pi/6$   
 $\pi/6$  RIGHT  $\rightarrow$   
 $(x - \pi/6)$   
PERIOD =  $\frac{4\pi}{6}$   
 $\frac{2\pi}{b} = \frac{4\pi}{6}$   
 $4\pi b = 12\pi$

$b = 3$

D.  $y = 2 \sin\left(x - \frac{\pi}{4}\right)$



k = midline = 0

a = 2 So

max line = 2

min line = -2

b = 1 so period = 2π

increment = π/2

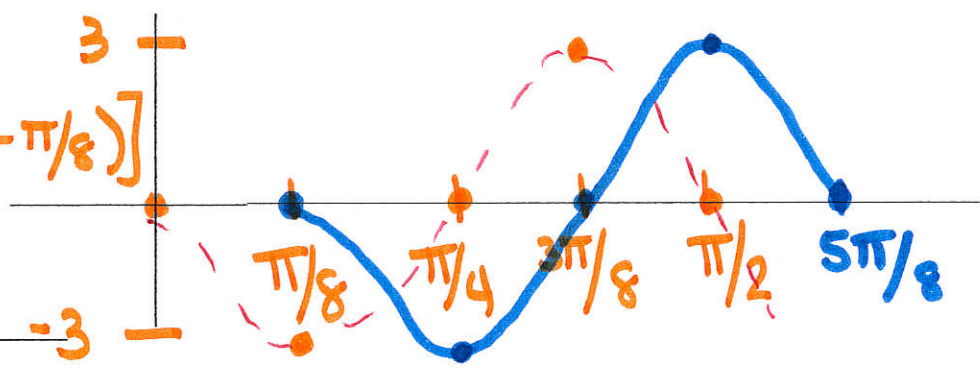
p.s. π/4 Right

Do you need to adjust increment?

E.  $y = -3 \sin\left(4x - \frac{\pi}{2}\right)$

$y = -3 \sin\left[4\left(x - \frac{\pi}{8}\right)\right]$

\*\*\* Is it in factored form?  
Rewrite - factor out "b"



k = midline = 0

a = -3 So

max line = 3

min line = -3

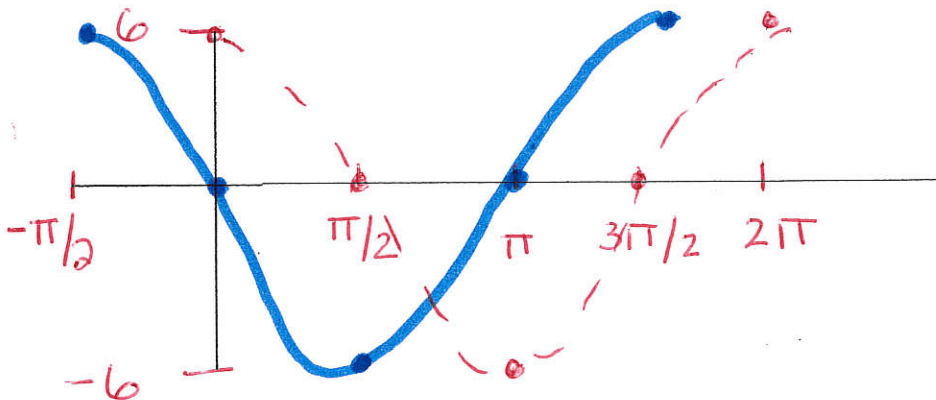
b = 4 so period = π/2

increment = π/8

p.s. π/8 Right

Do you need to adjust increment?

F.  $y = 6 \cos(x + \frac{\pi}{2})$



k = midline = 0

a = 6 So

max line = 6

min line = -6

Where does graph "start"? max

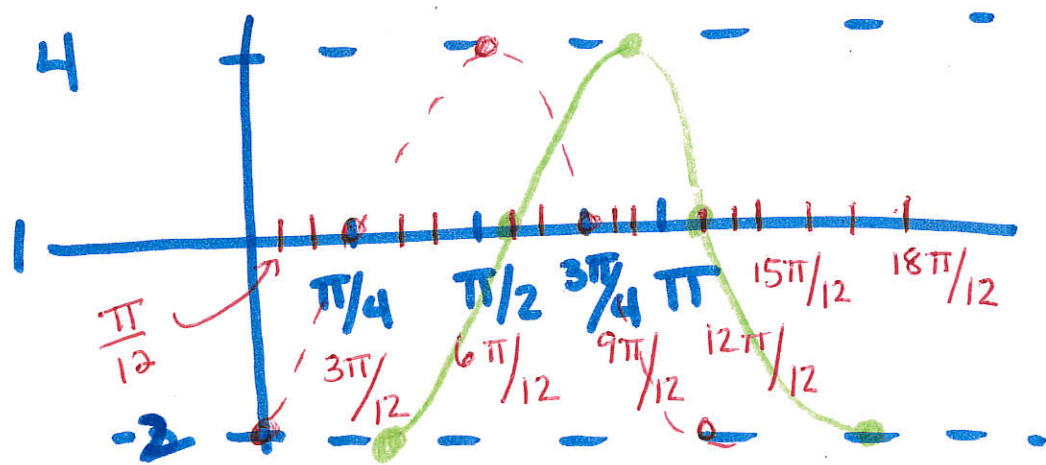
b = 1 so period = 2π

increment = π/2

p.s. π/2 left

Do you need to adjust increment?

G.  $y = -3 \cos 2(x - \frac{\pi}{3}) + 1$



k = midline = 1

a = 3 So

max line = 4

min line = -2

Where does graph "start"? min

b = 2 so period = π

increment = π/4 = 3π/12

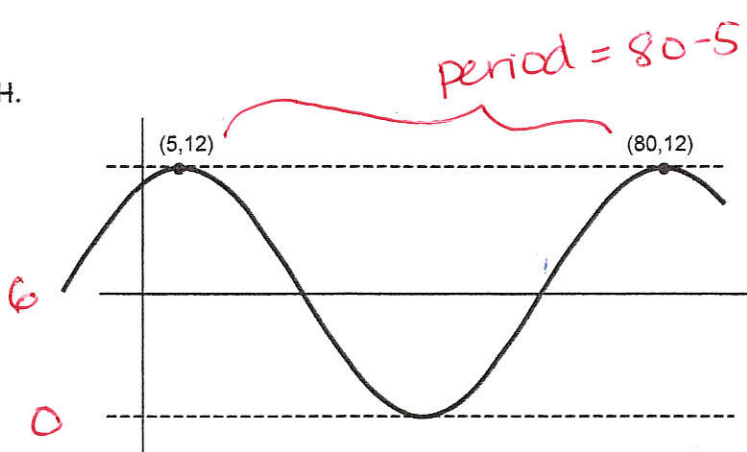
p.s. RIGHT π/3 = 4π/12

Do you need to adjust increment?

left

Write the equations of the graphs below: Use these questions to help you! Use paper!

H.



Sine or cosine? cosine pos

$K = +6$

$a = 6$

$h = 5$  right

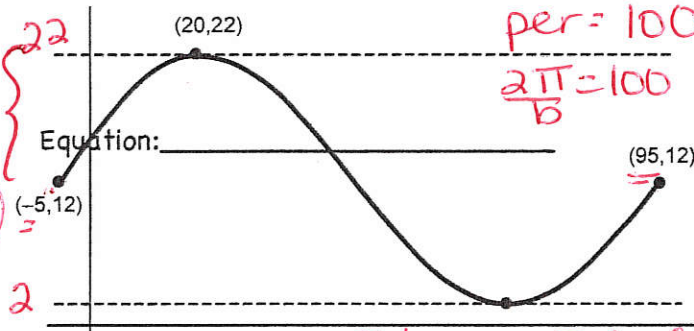
period = 75 so

$b = \frac{75 = \frac{2\pi}{b}}{b} = 75b = 2\pi$   
 $b = \frac{2\pi}{75}$

EQ: \_\_\_\_\_

$y = 6 \cos \left[ \frac{2\pi}{75} (x-5) \right] + 6$

I.



per = 100

$\frac{2\pi}{b} = 100$

$100b = 2\pi$

$b = \frac{\pi}{50}$

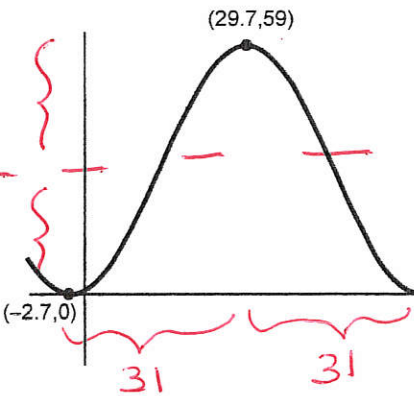
Equation: \_\_\_\_\_

EQ: \_\_\_\_\_

I: SINE: p.s. = 5 left

$y = 10 \sin \left[ \frac{\pi}{50} (x+5) \right] + 12$

J.



29.5

$d = 29.5$

$a = -29.5 \cos$

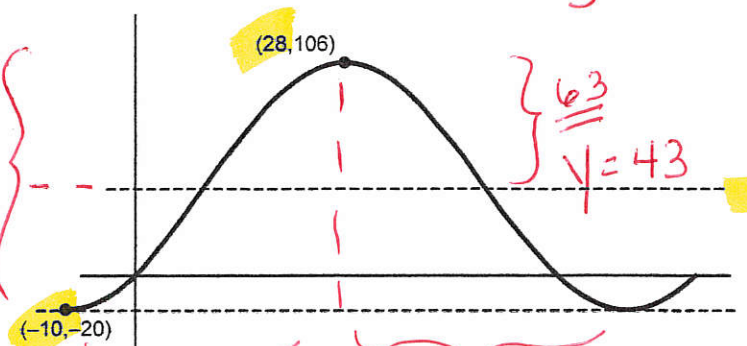
cos p.s. 2.7 left

$y = -29.5 \cos \left[ \frac{29.5}{31} (x+2.7) \right] + 29.5$

if use COS  
P.S. = 20 RT.

$y = 10 \cos \left[ \frac{\pi}{50} (x-20) \right] + 12$

K.



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$b = 3$   
 $y = 43$

Neg COS:  $a = -63$

$d = 43$

$y = -63 \cos \left[ \frac{\pi}{38} (x+10) \right] + 43$

$a = -10$

p.s. = 10 left

$(x+10)$

$\therefore \text{per} = 38 = \frac{2\pi}{b}$   $232b = 2\pi$   $b = \frac{\pi}{38}$