

Warm Up

Put in standard form

$$3. \quad \frac{y+5}{3} = \cos(2\theta + 90^\circ) + 6$$

$$y + 5 = 3\cos(2\theta + 90^\circ) + 18$$

$$y = 3\cos(2\theta + 90^\circ) + 13$$

$$y = 3\cos[2(\theta + 45^\circ)] + 13$$

$$A = 3$$

$$k = 2$$

$$c = -45^\circ$$

$$D = 13$$

$$P = 180$$

Equation of
Sinusoidal Axis: $y = 13$

Graph the following:

$$y = -2 \cos[2(x - 90)] - 3 \quad (x, y) \rightarrow \left(\frac{x}{k} + C, Ay + D \right)$$

A = 2

k = 2

C = 90

D = -3

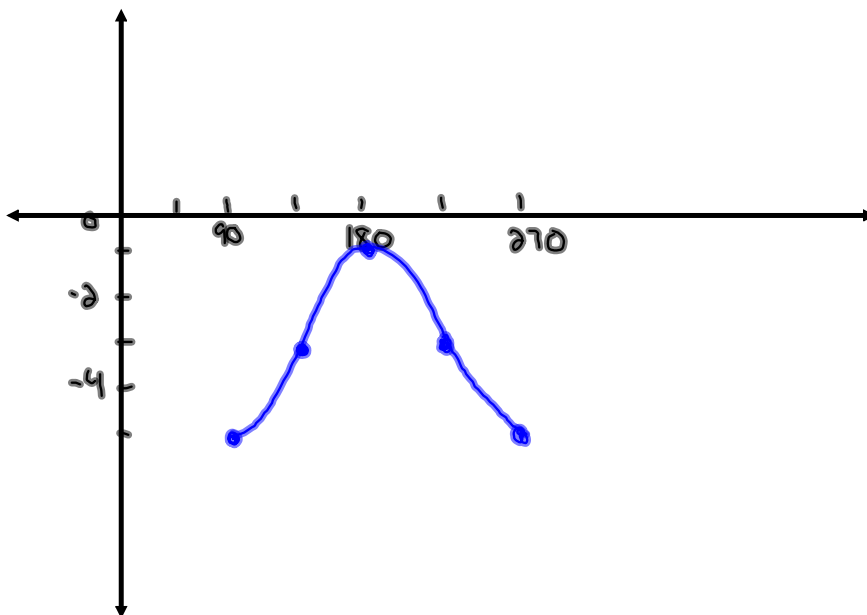
P = 180

$$y = -\cos x$$

x	y
0	-1
90	0
180	1
270	0
360	-1

New points after mapping

x	y
90	-5
135	-3
180	-1
225	-3
270	-5



Questions from Assignment

$$⑤ \quad 2y + 3 = -4 \sin(4\theta - 60^\circ) - 3$$

$$\frac{2y}{2} = \frac{-4}{2} \sin(4\theta - 60^\circ) - \frac{6}{2}$$

$$y = -2 \sin[4(\theta - 15^\circ)] - 3$$

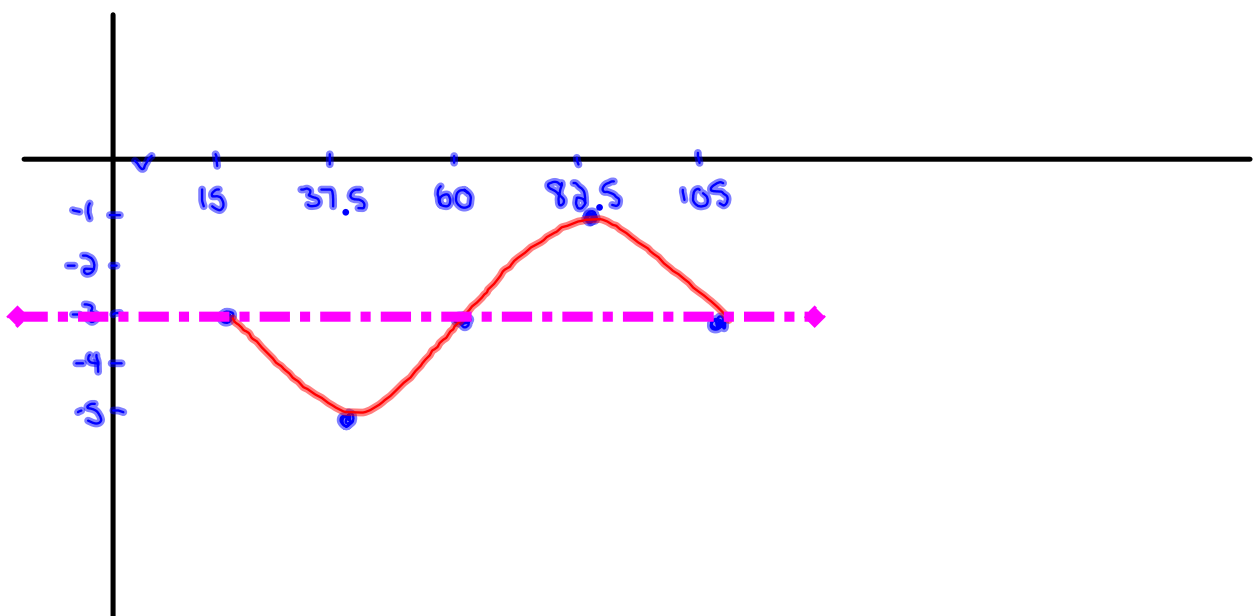
$A = 2$ $K = 4$ $C = 15^\circ$ $D = -3$
 $P = 90^\circ$

$y = -\sin x$

X	y
0	0
90	-1
180	0
270	1
360	0

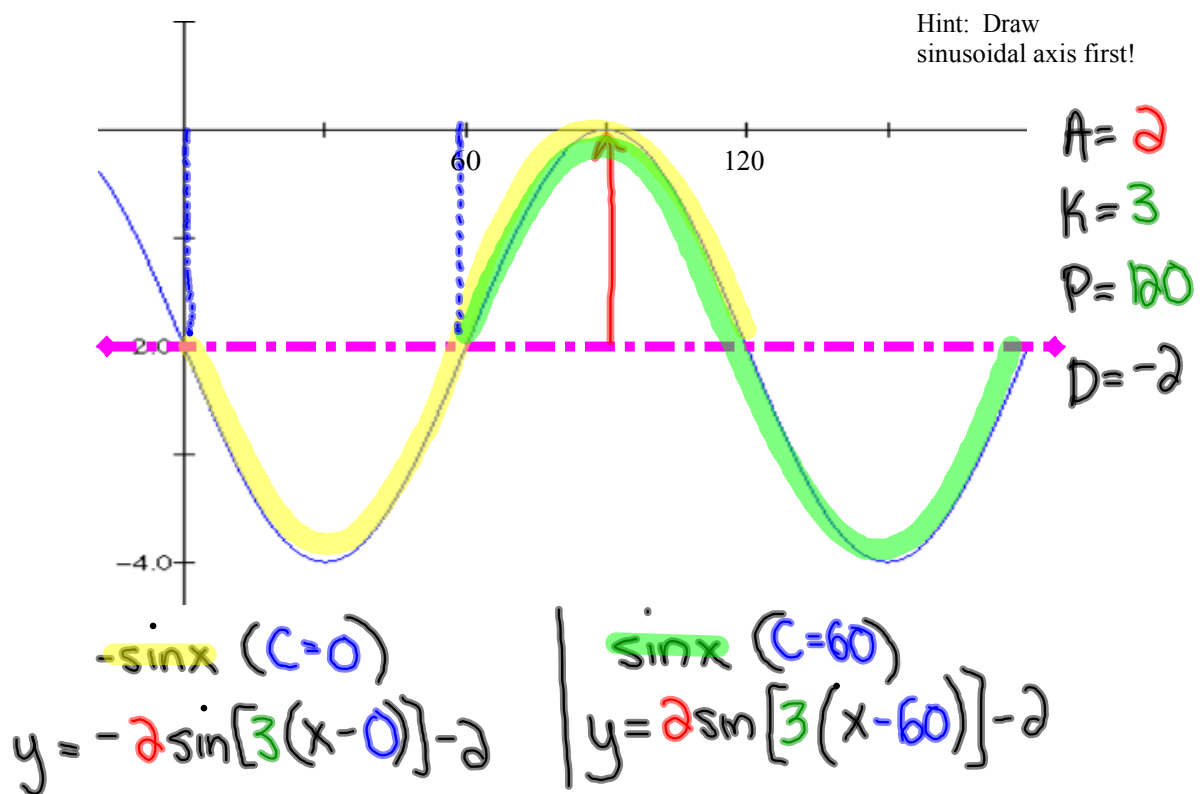


X	y
15	-3
37.5	-5
60	-3
82.5	-1
105	-3



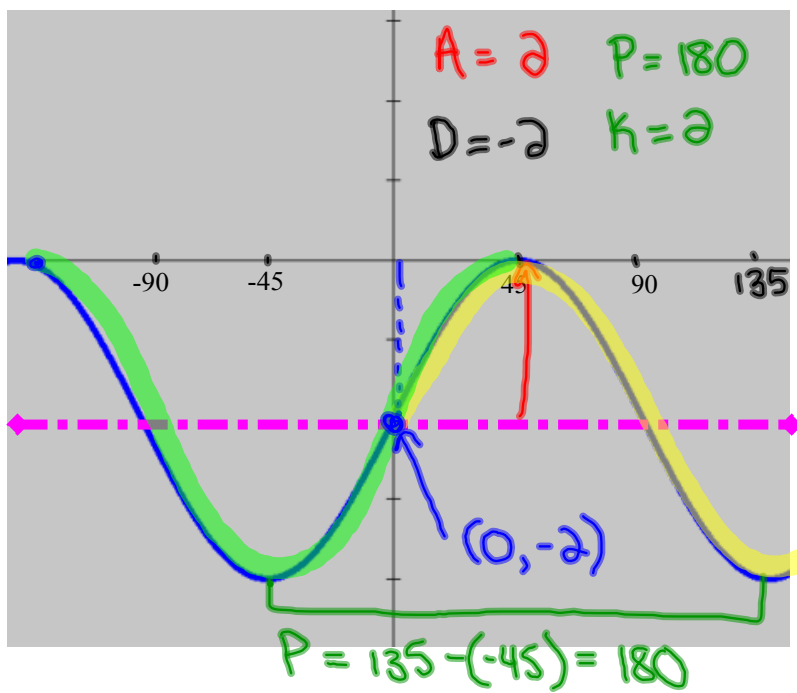
Finding an Equation from a Graph:

Can you find an equation that describes this graph?



Check the equation using any point from the graph

Develop an equation that corresponds to the graph



Hint: Draw sinusoidal axis first!

Look for a **sine** graph

$C = 0$

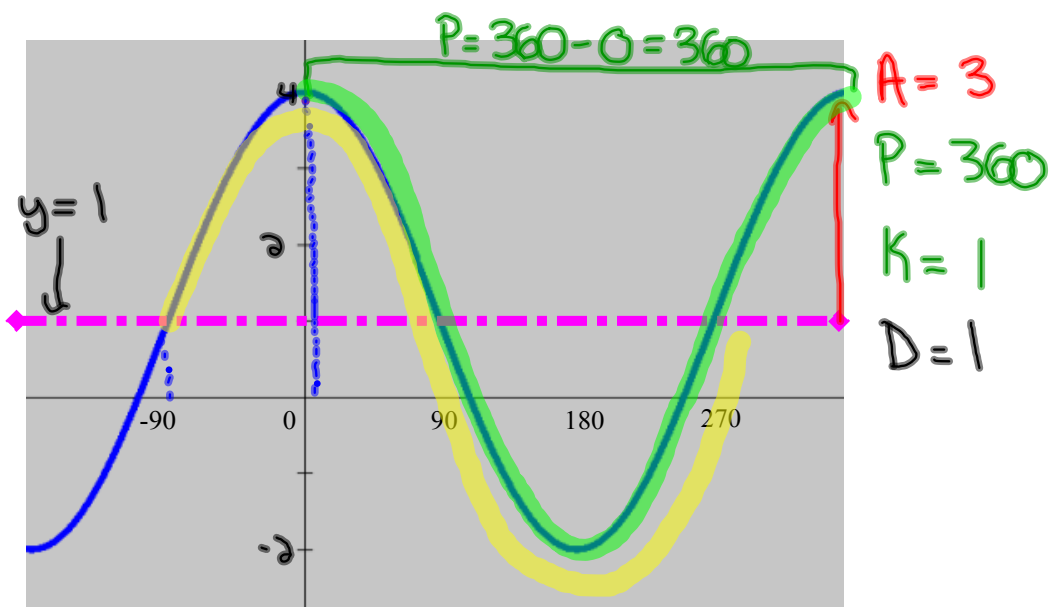
$y = 2 \sin [2(x - 0)] - 2$

What about a **cosine** graph?

$C = -135$

$y = 2 \cos [2(x + 135)] - 2$

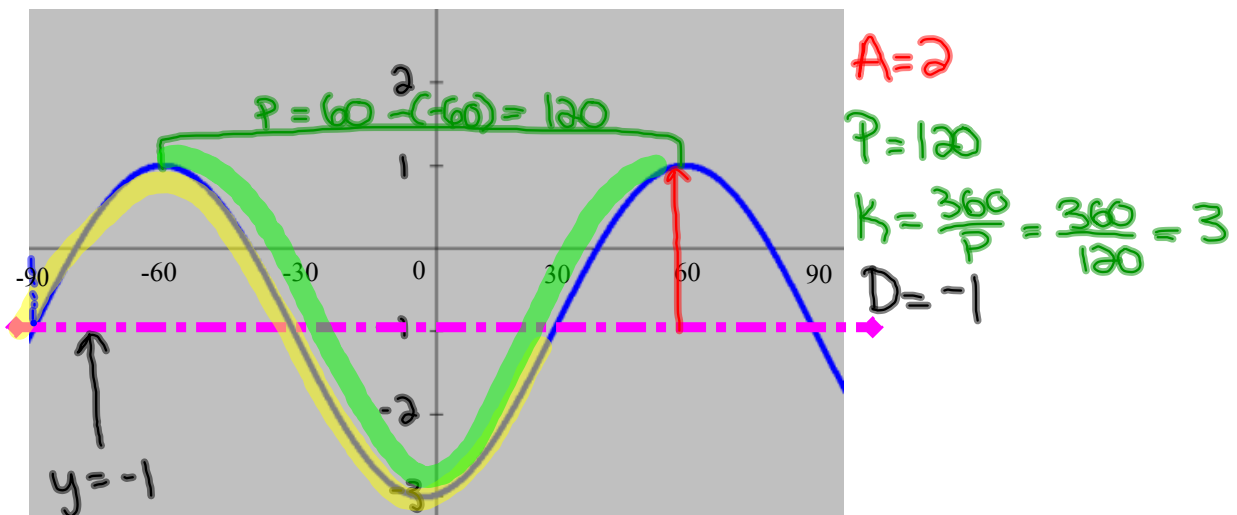
Determine a **sine** and a **cosine** equation for this graph



$\cos x \quad (c=0)$
 $y = 3 \cos[1(x-0)] + 1$
 $y = 3 \cos(x) + 1$

$\sin x \quad (c=-90)$
 $y = 3 \sin[1(x+90)] + 1$
 $y = 3 \sin(x+90) + 1$

Write both a **sine** and **cosine** equation to describe the following graph:



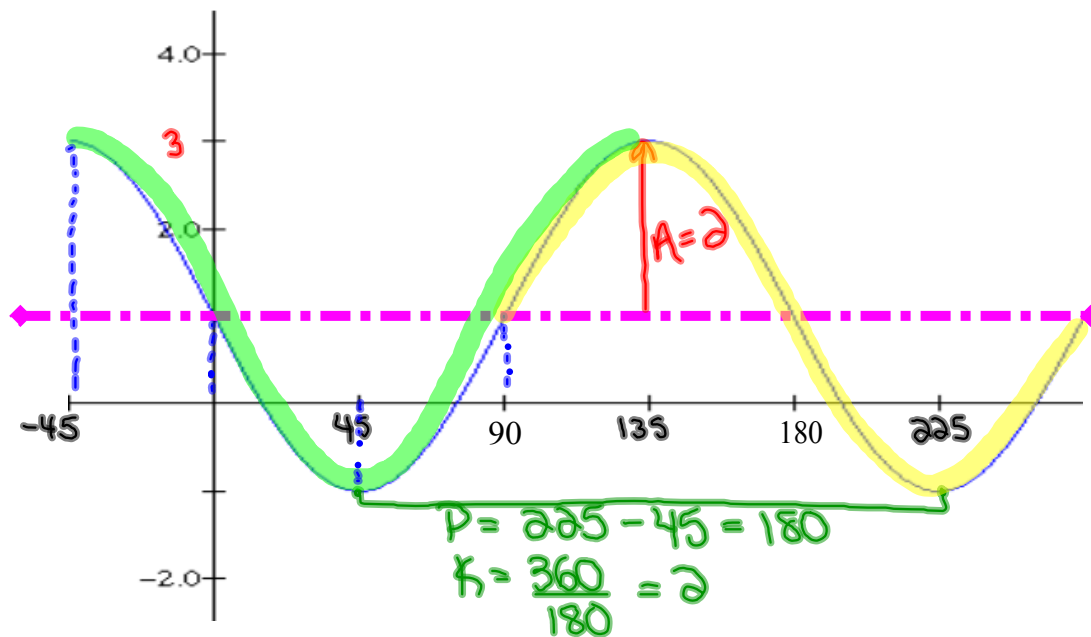
$$\sin x \quad (c = -90)$$

$$y = 2 \sin[3(x+90)] - 1$$

$$\cos x \quad (c = -60)$$

$$y = 2 \cos[3(x+60)] - 1$$

Find four equations that match the graph:



+ sin

$$A = 2$$

$$k = 2$$

$$C = 90$$

$$D = 1$$

$$y = 2 \sin[2(x - 90)] + 1$$

- sin

$$A = 2$$

$$k = 2$$

$$C = 0$$

$$D = 1$$

$$y = -2 \sin[2(x)] + 1$$

+ cos

$$A = 2$$

$$k = 2$$

$$C = -45$$

$$D = 1$$

$$y = 2 \cos[2(x + 45)] + 1$$

- cos

$$A = 2$$

$$k = 2$$

$$C = 45$$

$$D = 1$$

$$y = -2 \cos[2(x - 45)] + 1$$

Homework

Mathematical Modeling p. #28

Attachments

Worksheet - Sketching Sinusoidal relations (sept06).pdf