Warm Up

Put in standard form

$$\frac{y+5}{3} = \cos(2\theta + 90°) + 6$$

$$y + 5 = 3\cos(2\theta + 90°) + 18$$

$$y = 3\cos(2\theta + 90°) + 13$$

$$y = 3\cos\left[2(\theta + 45°)\right] + 13$$

"Left" "Up"

$A = 3$ $K = 2$ $C = -45°$ $D = 13$

$$P = \frac{360}{2} = 180$$

Graph the following:

$$y = -2\cos[2(x-90)]-3$$

$$(x, y) \rightarrow \left(\frac{x}{k}+C, Ay+D\right)$$

A = 2

k = 2

C = 90

D = -3

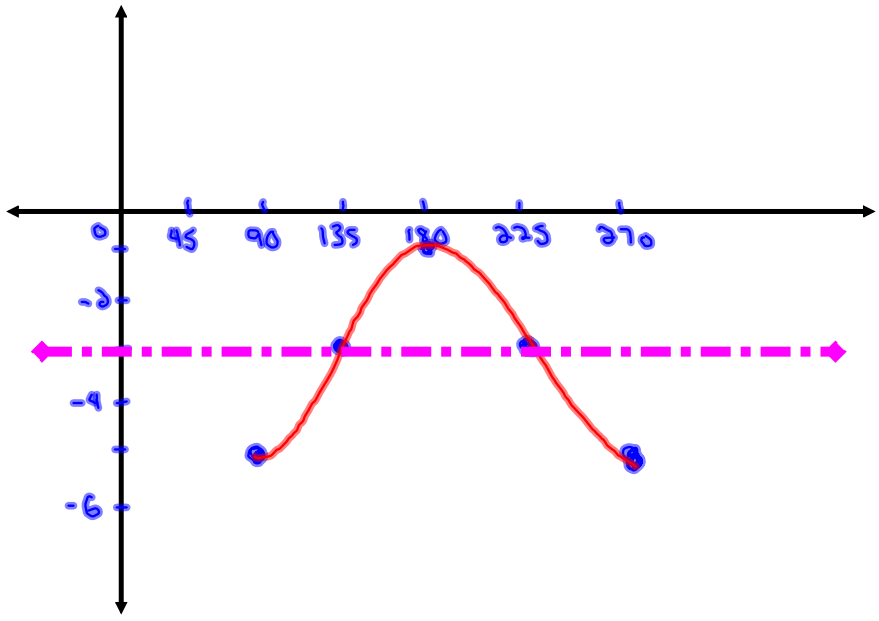
P = 180

$y = -\cos x$

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 $2y + 3 = -4\sin(4x - 60) - 3$ -3

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

$$y = -2\sin(4x - 60^\circ) - 3$$

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

$A = 2$ $\quad K = 4$ $\quad C = 15$ $\quad D = -3$

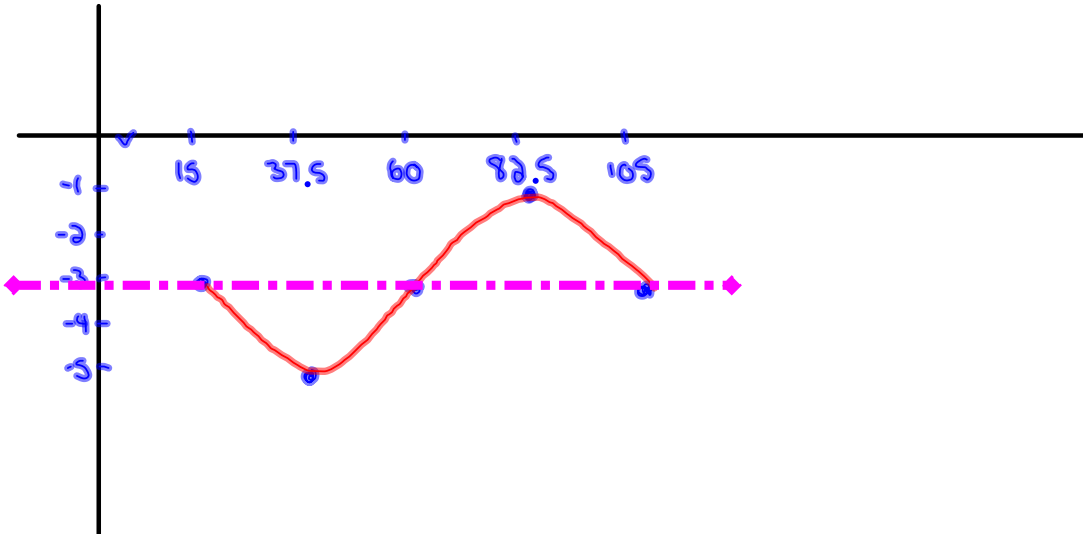
$P = 90^\circ$

$y = -\sin x$

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

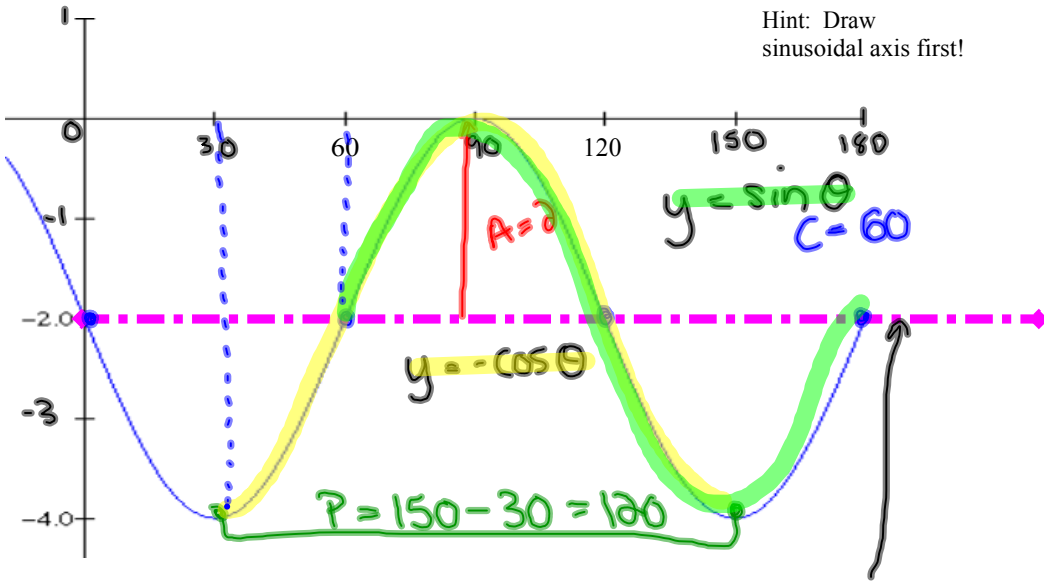
→

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?



$A = 2$ $\quad k = 3$ $\quad C = 30°$ $\quad D = -2$

$P = 120$

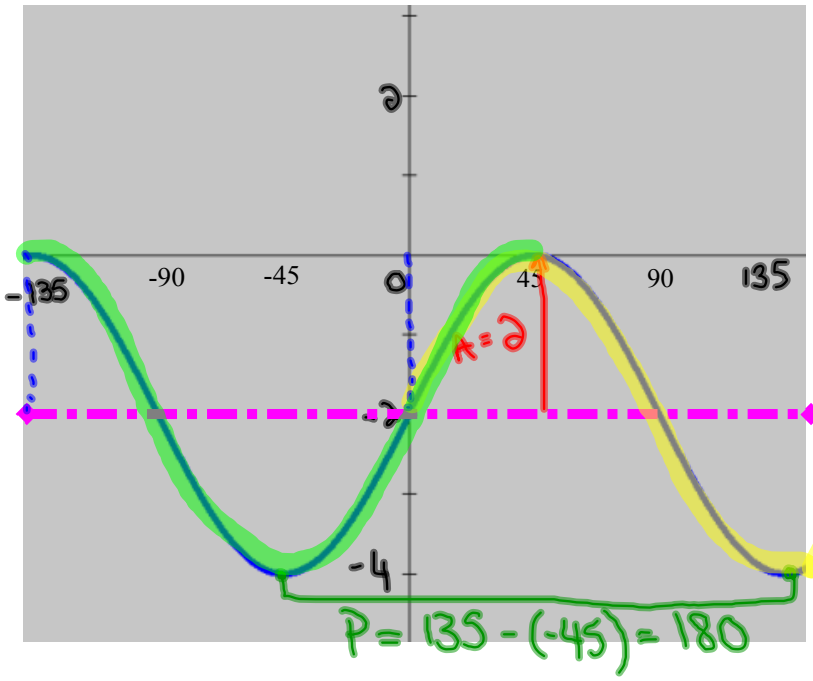
Check the equation using **any** point from the graph

$$y = -2\cos[3(\theta - 30°)] - 2$$

or

$$y = 2\sin[3(\theta - 60°)] - 2$$

Develop an equation that corresponds to the graph



Hint: Draw sinusoidal axis first!

(+)

Look for a sine graph

$A = 2$

$K = \frac{360}{180} = 2$

$C = 0$

$D = -2$

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

What about a cosine graph?

$A = 2$

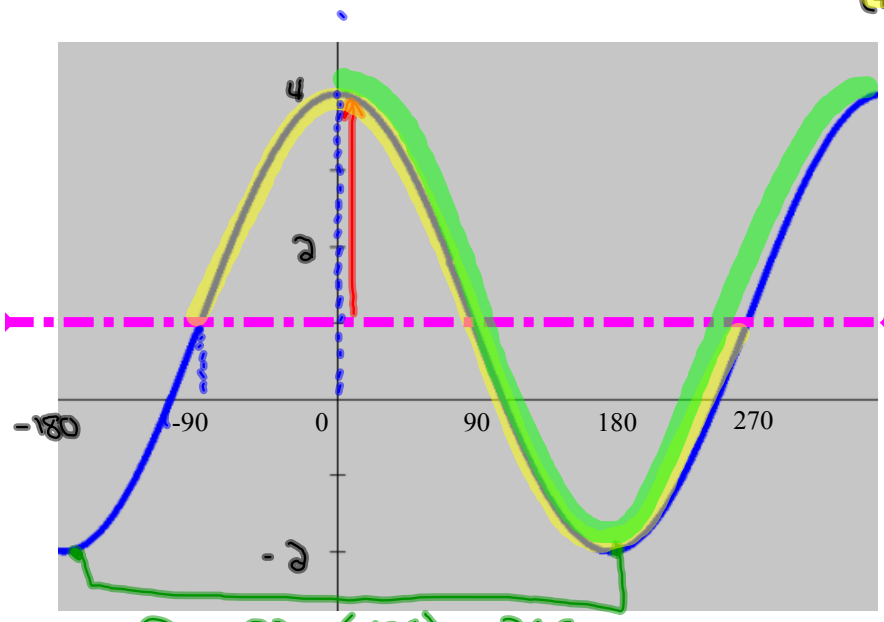
$K = 2$

$C = -135$

$D = -2$

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

Determine a sine and a cosine equation for this graph



$P = 180 - (-180) = 360$

$K = \frac{360}{360} = 1$

(+) sine

$A = 3$

$K = 1$

$C = -90$

$D = 1$

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

$y = 3\sin(x+90)+1$

(+) cos

$A = 3$

$K = 1$

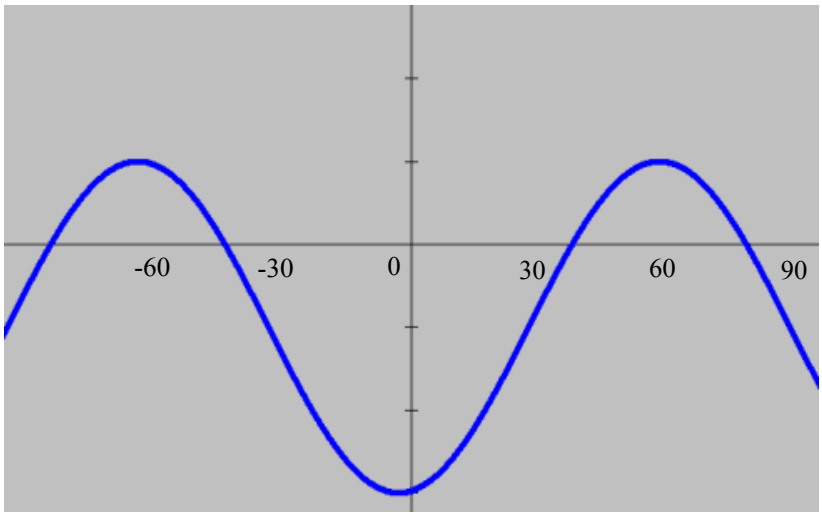
$C = 0$

$D = 1$

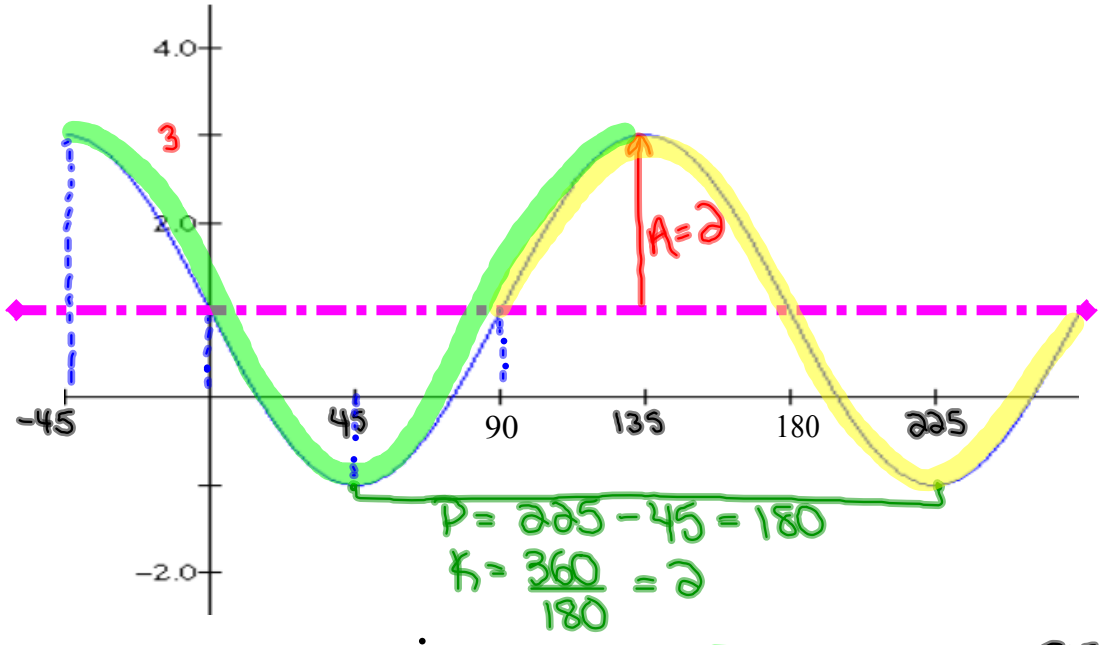
$y = 3\cos[1(x)]+1$

$y = 3\cos x + 1$

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



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