

### Questions from homework

Let  $x$  = investment @ 8%

Let  $y$  = " " 16%

Let  $z$  = " " 16%

$$x + y + z = 9000$$

$$0.08x + 0.1y + 0.16z = 1160$$

$$-0.08x - 0.1y + 0.16z = 440$$

$$\left[ \begin{array}{ccc|c} 1 & 1 & 1 & 9000 \\ 0.08 & 0.1 & 0.16 & 1160 \\ -0.08 & -0.1 & 0.16 & 440 \end{array} \right] \rightarrow \left[ \begin{array}{ccc|c} 1 & 0 & 0 & 2000 \\ 0 & 1 & 0 & 2000 \\ 0 & 0 & 1 & 5000 \end{array} \right]$$

$$\textcircled{11} \quad y = ax^2 + bx + c \quad \overset{x,y}{(2,0)}; (-1,6); (3,2)$$

$$\textcircled{1} \quad 0 = 4a + 2b + c \quad 4a + 2b + c = 0$$

$$\textcircled{2} \quad 6 = a - b + c \quad a - b + c = 6$$

$$\textcircled{3} \quad 2 = 9a + 3b + c \quad 9a + 3b + c = 2$$

$$\left[ \begin{array}{ccc|c} 4 & 2 & 1 & 0 \\ 1 & -1 & 1 & 6 \\ 9 & 3 & 1 & 2 \end{array} \right] \rightarrow \left[ \begin{array}{ccc|c} 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & -3 \\ 0 & 0 & 1 & 2 \end{array} \right]$$

$$a = 1$$

$$b = -3$$

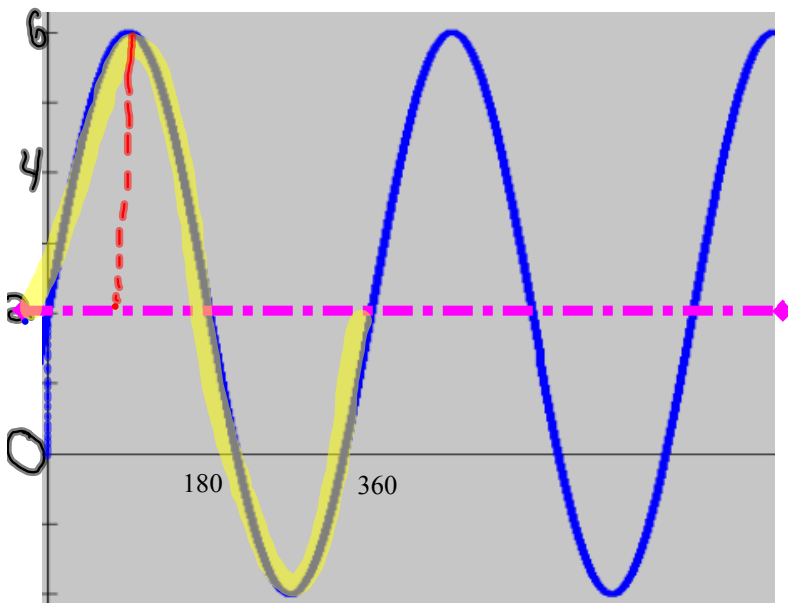
$$c = 2$$

Put in standard form

$$\cancel{3} \cdot \frac{y+5}{\cancel{3}} = \cancel{3} \cdot \cos[2\theta + 90^\circ] + \cancel{3} \cdot 6$$

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

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



Equation of Graph:  $y = 4\sin[1(x-0)] + 2$   
 $y = 4\sin(x) + 2$

Find:

Local Max: 6

Local Min: -2

Equation of Sinusoidal Axis:

$y = 2$

Period:  $360^\circ$

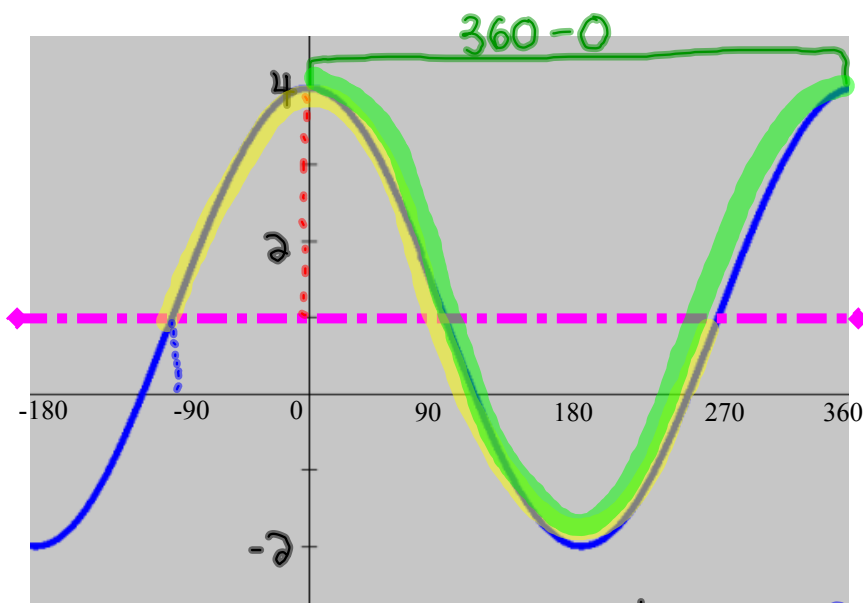
Amplitude: 4

Horizontal Translation (C): 0

Vertical Translation (D): 2

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

Determine a sine and a cosine equation for this graph



$$A = 3$$

$$P = 360$$

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

$$D = 1$$

$\sin C = -90^\circ$ $y = 3 \sin[1(x + 90^\circ)] + 1$ $y = 3 \sin(x + 90^\circ) + 1$	$\cos C = 0$ $y = 3 \cos[1(x - 0)] + 1$ $y = 3 \cos(x) + 1$
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$$y = \underline{2} \sin[\underline{2}(\theta - \underline{30})] + \underline{1}$$

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

$$A = 2$$

$$k = 2$$

$$C = 30^\circ$$

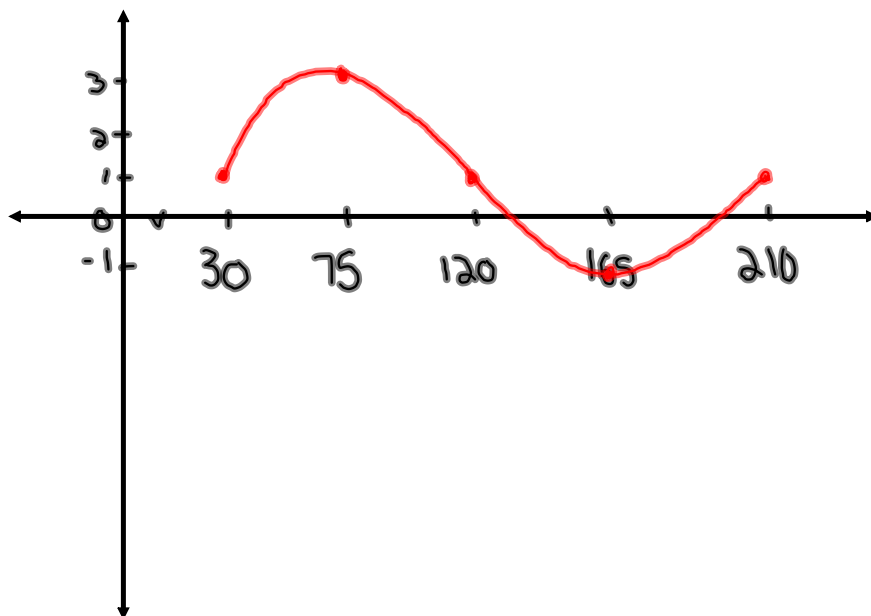
$$D = 1$$

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

$$y = \sin \theta$$

$\theta$	$y$
0	0
90	1
180	0
270	-1
360	0

$\theta$	$y$
30	1
75	3
120	1
165	-1
210	1



A water wheel with a radius of 8m makes one complete revolution every 20 seconds. If 3m of the wheel is submerged and the bucket starts on the sinusoidal axis and goes up, find the following information:

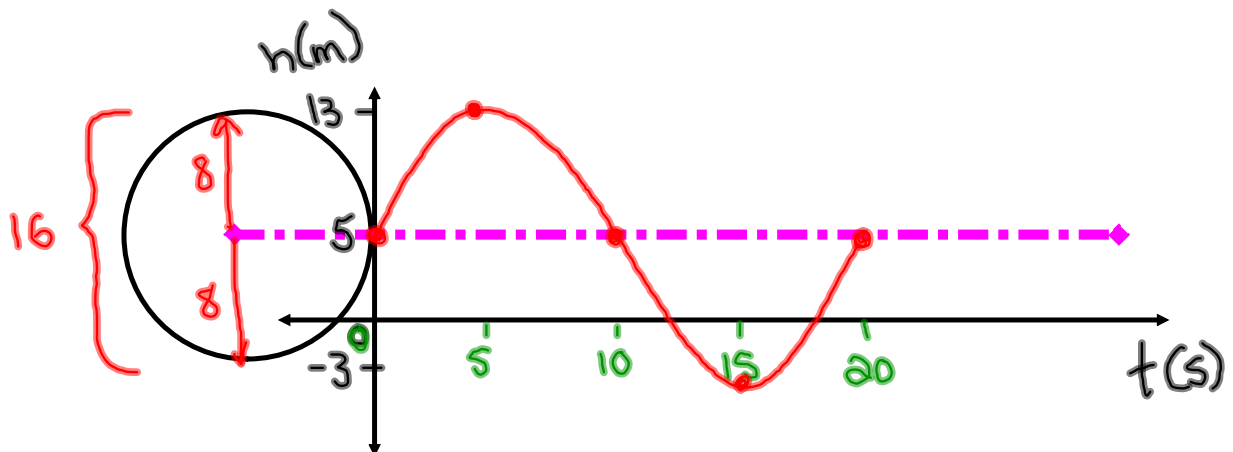
+ sin

a) Amplitude = 8      c)  $k = \frac{360}{20} = 18$       e) Max Height = 13

b) Period = 20      d) Vertical Translation = 5      f) Min Height = -3

g) Equation of the graph:  $y = 8\sin[18(x)] + 5$

h) Sketch the graph for one revolution



\*  $\frac{P}{4} = \frac{20}{4} = 5$   
 Count by 5's on  
 x-axis