⑥c) $3x + 2y + 2z = 29$
   $9x + 8y + 9z = 116$
   $x + 2y + 9z = 86$

$\begin{bmatrix} 3 & 2 & 2 & | & 29 \\ 9 & 8 & 9 & | & 116 \\ 1 & 2 & 9 & | & 86 \end{bmatrix}$

```
rref([A]
  [[1 0 0 3]
   [0 1 0 1]
   [0 0 1 9]]
```

$X = 3$
$y = 1$
$z = 9$

④c) $x + y - z = 1$ $\frac{1+3}{3x + 3y - 3z = 3}$ $\frac{2+4}{4y + 2z = 2}$
   $\boxed{2y + z = 1}$ ⇔ $3x - y - 5z = 1$ ⇔ $4y + 2z = 2$
   $3x - y - 5z = 1$ $\boxed{4y + 2z = 2}$ $0 = 0$

$\boxed{\text{let } z = t}$ $2y + t = 1$ $x + \left(\frac{1-t}{2}\right) - t = 1$
          $2y = 1 - t$ $2x + 1 - t - 2t = 2$
          $\boxed{y = \frac{1-t}{2}}$ $2x + 1 - 3t = 2$
               $2x = 1 + 3t$
               $\boxed{x = \frac{1+3t}{2}}$

⑧ Let x = investment @ 8%.
   Let y =   "   @ 10%.
   Let z =   "   @ 16%.

   $x + y + z = 9000$
   $0.08x + 0.10y + 0.16z = 1160$
   $-0.08x - 0.10y + 0.16z = 440$

```
rref([A]
  [[1 0 0 2000]
   [0 1 0 2000]
   [0 0 1 5000]]
```

⑦ $\begin{bmatrix} 7 & 3 \\ 2 & 1 \end{bmatrix}$

```
[D]⁻¹
   [[1  -3]
    [-2  7]]
■
```

④a) $2x+3y+7z=15$

$5x+4y-4z=-2$

$-2x+y+2z=-1$

$\frac{\times 3}{}$ (#) $2x+3y+7z=15$ (-) $10x+15y+35z=75$

$\frac{\times 3}{}$ $\underline{-2x+y+2z=-1}$ $\underline{10x+8y-8z=-4}$

$\boxed{4y+9z=14}$ $7y+43z=79$

(-) $28y+63z=98$ $4y+9z=14$ $2x+3y+7z=15$

$\underline{28y+170z=316}$ $4y+9(2)=14$ $2x+3(-1)+7(2)=15$

$-109z=-218$ $4y+18=14$ $2x-3+14=15$

$\boxed{z=2}$ $4y=-4$ $2x=4$

$\boxed{y=-1}$ $\boxed{x=2}$

$(2,-1,2)$

④a) $2x+3y+7z=15$

$5x+4y-4z=-2$

$-2x+y+2z=-1$

$$\begin{bmatrix} 2 & 3 & 7 & | & 15 \\ 5 & 4 & -4 & | & -2 \\ -2 & 1 & 2 & | & -1 \end{bmatrix} \longrightarrow \begin{bmatrix} 1 & 0 & 0 & | & 2 \\ 0 & 1 & 0 & | & -1 \\ 0 & 0 & 1 & | & 2 \end{bmatrix}$$

⑧ Let x = investment @ 8%

Let y = " @ 10%

Let z = " @ 16%

$x+y+z=9000$

$0.08x+0.10y+0.16z=1160$

$-0.08x-0.10y+0.16z=440$

$$\begin{bmatrix} 1 & 1 & 1 & | & 9000 \\ .08 & .10 & .16 & | & 1160 \\ -.08 & -.10 & .16 & | & 440 \end{bmatrix} \longrightarrow \begin{bmatrix} 1 & 0 & 0 & | & 2000 \\ 0 & 1 & 0 & | & 2000 \\ 0 & 0 & 1 & | & 5000 \end{bmatrix}$$

2

Put in standard form

3. $\dfrac{y+5}{3} =^3 \cos[(2\theta + 90°)] + 6 \cdot 3$

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

$$y = 3\cos[2(\theta + 45°)] + 13$$

$A = 3$ $\quad$ $K = 2$ $\quad$ $P = \dfrac{360}{2}$ $\quad$ $C = -45$ $\quad$ $D = 13$

$= 180$

+ sin
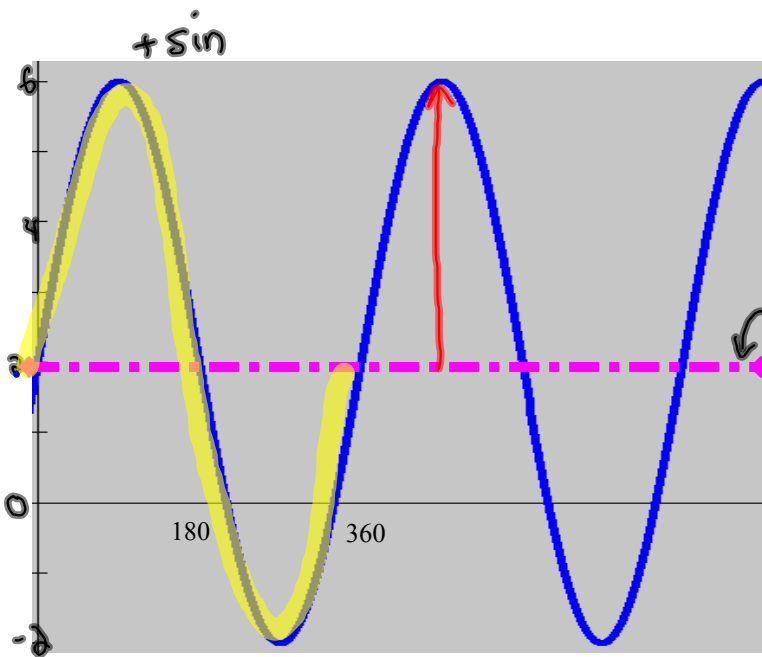
Find:

Local Max: ___6___

Local Min: ___-2___

Equation of Sinusiodal Axis:

$y = 2$

Period: ___360___

Amplitude: ___4___

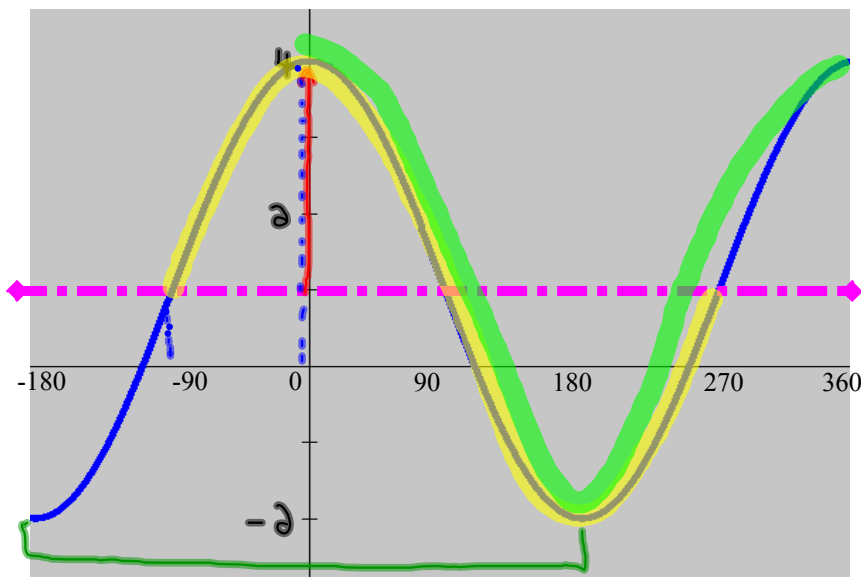Horizontal Translation (C): ___0___

Vertical Translation (D): ___2___

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

$$y = 4\sin(\theta) + 2$$

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

Determine a sine and a cosine equation for this graph

$$A = 3$$
$$P = 360$$
$$K = 1$$
$$D = 1$$

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

+ sin   C = -90°

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

+ cos   C = 0

$$y = 3\cos[1(\theta + 0)] + 1$$
$$y = 3\cos(\theta) + 1$$

$$y = 2\sin[2(\theta - 30)] + 1 \qquad (x, y) \rightarrow \left(\frac{x}{k} + C, Ay + D \right)$$

A = 2

k = 2

C = 30

D = 1

P = 180

$y = \sin\theta$

θ	y
0	0
90	1
180	0
270	-1
360	0

θ	y
30	1
75	3
120	1
165	-1
210	1
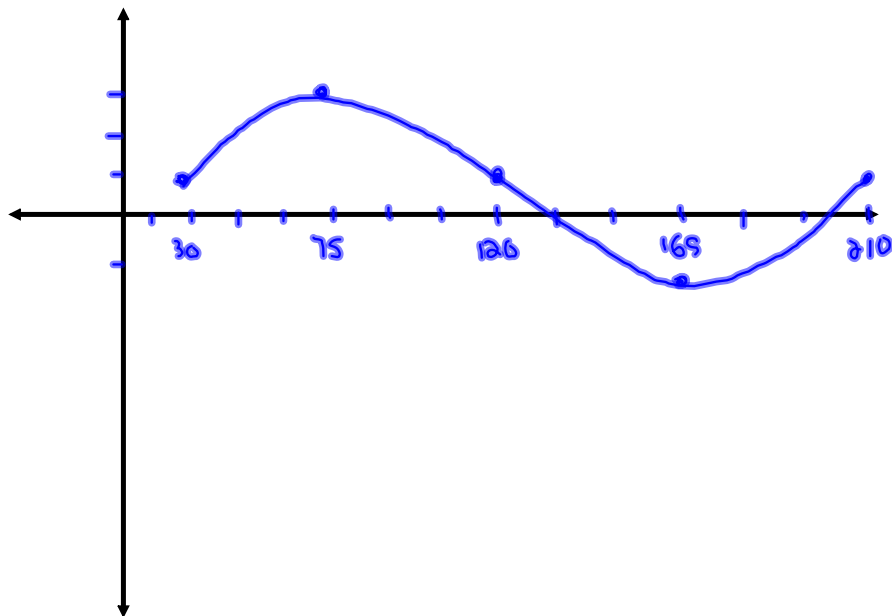
A water wheel with a radius of <u>8m</u> makes one complete revolution <u>every 20 seconds</u>. If <u>3m of the</u> wheel is submerged and the <mark>bucket starts on the sinusoidal axis and goes up,</mark> $+\sin$ find the following information:

a) Amplitude $= 8$ c) k: $= \dfrac{360}{20} = 18$ 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