Per 3

**Writing Equations – NOTES**

range: $[d-a, d+a]$

$\frac{2\pi}{\text{new per}} = b$

$\frac{\text{original}}{\text{new}} = b$

$\frac{2\pi}{2\pi}$

1) period $2\pi$ b $1$

maximum $2$

minimum $-4$

amplitude $3$

vertical slide $-|a| \downarrow$

amp: $\frac{\max - \min}{2}$

$\frac{2 - -4}{2} = 3$

$d = \frac{2 + -4}{2} = \frac{-2}{2}$

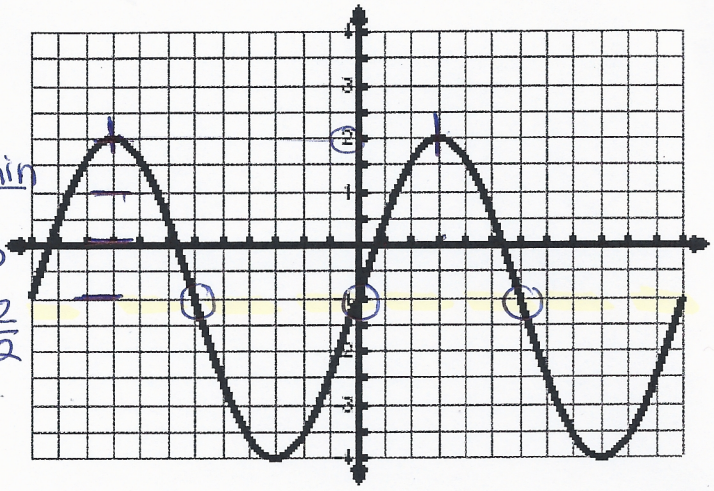
$d = -1$

phase shift (sine) none

sine equation $y = 3\sin\theta - 1$

phase shift (cosine) $\frac{\pi}{2} \rightarrow$

cosine equation $y = 3\cos(\theta - \frac{\pi}{2}) - 1$



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

2) period $\frac{6\pi}{6} = \pi$ b $2$

maximum $1.5$

minimum $-.5$

$1.5 - -.5 = 2$

$\frac{2}{2} = 1$

amplitude $1$

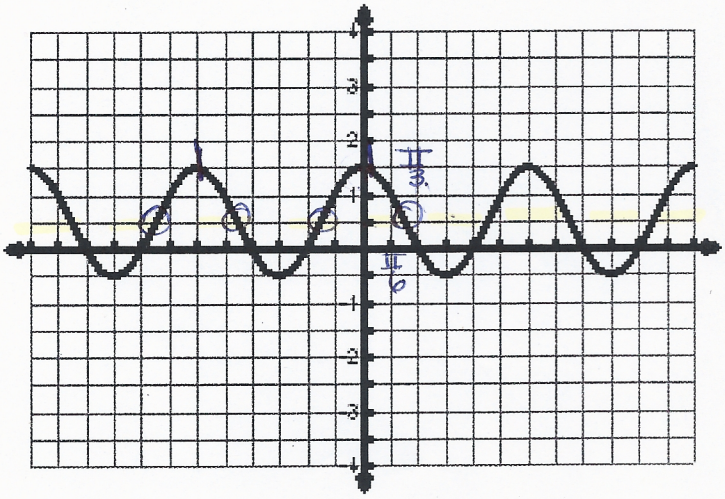
vertical slide $\frac{1}{2} \uparrow$

phase shift (sine) $\frac{\pi}{4} \leftrightarrow$

sine equation $y = \sin 2(\theta + \frac{\pi}{4}) + \frac{1}{2}$

phase shift (cosine) none

cosine equation $y = \cos 2\theta + \frac{1}{2}$




$\frac{2\pi}{\frac{2\pi}{3}} = \frac{2\pi \cdot 3}{2\pi}$

3) period $\frac{4\pi}{6} = \frac{2\pi}{3}$ b $3$

maximum $-1$

minimum $-2$

$\frac{-1 - -2}{2} = \frac{1}{2}$

amplitude $1/2$

vertical slide $-1.5$ or $-\frac{3}{2}$ $\frac{3}{2} \downarrow$

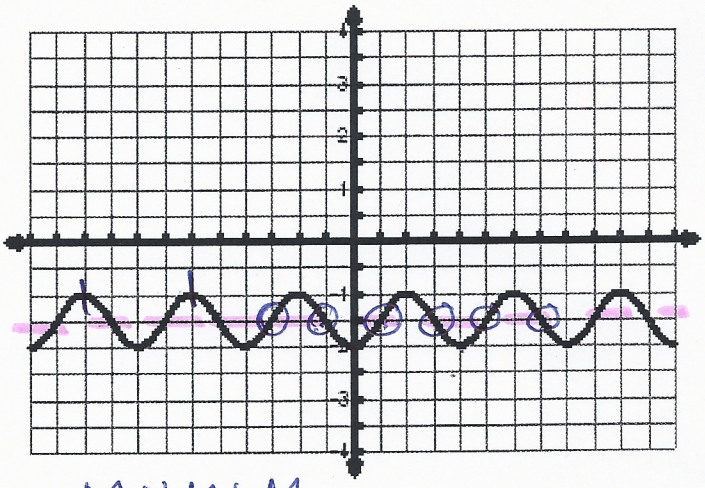
phase shift (sine) $\frac{\pi}{6} \rightarrow$

sine equation $y = \frac{1}{2}\sin 3(\theta - \frac{\pi}{6}) - \frac{3}{2}$

phase shift (cosine) $\frac{\pi}{3} \leftrightarrow$

cosine equation $y = \frac{1}{2}\cos 3(\theta - \frac{\pi}{3}) - \frac{3}{2}$

$y = -\frac{1}{2}\cos 3\theta - \frac{3}{2}$



MHMLM

$\frac{\pi}{6} \leftarrow$ $y = -\frac{1}{2}\sin 3(\theta + \frac{\pi}{6}) - \frac{3}{2}$