

Name: _____ Date: _____ Hour: _____

Sine Vertical Translations and Phase Shifts

1.

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

amp = $\frac{1}{2}$ period = $\frac{2\pi}{3}$ flip = no

phase shift = $\frac{-\pi/2}{\text{left}}$ vertical shift = $\frac{-1}{\text{down}}$

$$\frac{2\pi}{3} \cdot \frac{1}{4} = \frac{\pi}{6}$$

each = $\frac{\pi}{6}$

2.

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

amp = 2 period = 6π flip = yes

phase shift = $\frac{\pi/3}{\text{right}}$ vertical shift = $\frac{1}{\text{up}}$

$$6\pi \cdot \frac{1}{4} = \frac{3\pi}{2}$$

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

3.

$$y = 4 \sin 3\left(\theta + \frac{\pi}{2}\right) - 1$$

amp = 4 period = $\frac{2\pi}{3}$ flip = no

phase shift = $\frac{-\pi/2}{\text{L}}$ vertical shift = $\frac{-1}{\text{d}}$

each = $\frac{\pi}{6}$

4. $y = \frac{2}{3} \sin\left(\theta - \frac{\pi}{2}\right)$

amp = $\frac{2}{3}$ period = 2π flip = no

phase shift = $\frac{\pi/2}{\text{R}}$ vertical shift = 0

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

5. $y = -\frac{1}{2} \sin 4(\theta - \pi) + 1$

amp = $\frac{1}{2}$ period = $\frac{\pi}{2}$ flip = yes

$$\frac{\pi}{2} \cdot \frac{1}{4} = \frac{\pi}{8}$$

phase shift = $\frac{\pi}{\text{R}}$ vertical shift = $\frac{1}{\text{U}}$

each = $\frac{\pi}{8}$

Find the *amplitude, period, vertical shift, phase shift and flip*. Graph one period.

6. $y = \sin\left(\theta + \frac{\pi}{2}\right)$

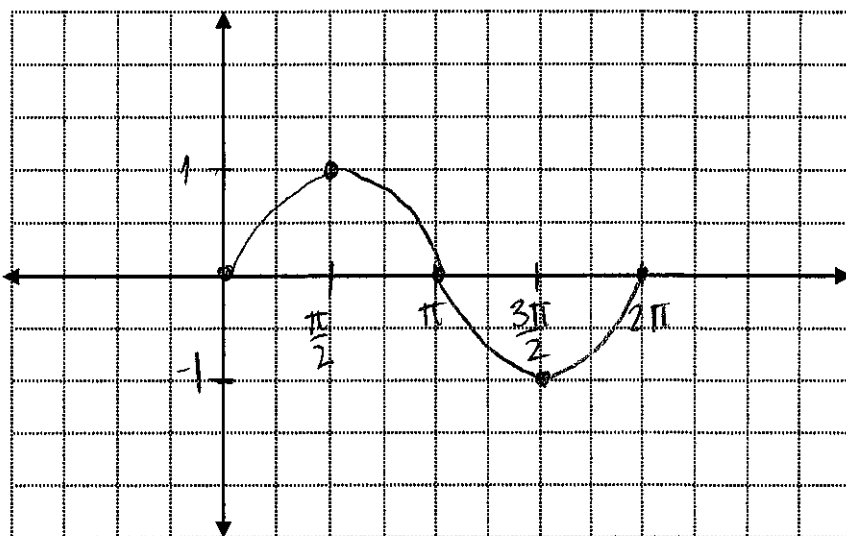
amplitude (a) = 1

b = 1 Period 2π

Phase shift $-\frac{\pi}{2}$

Vertical shift 0 Flip no

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



7. $y = 2\sin 3\left(\theta + \frac{\pi}{3}\right) + 2$

amplitude (a) = 2

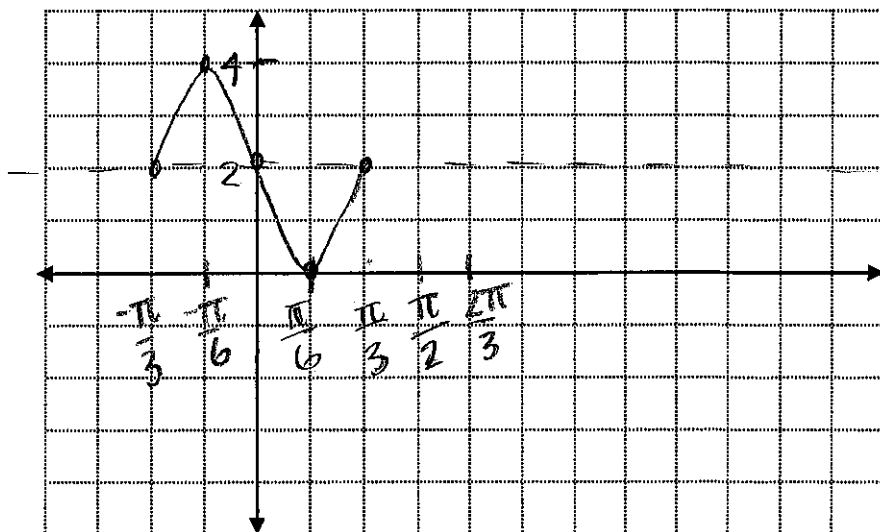
b = 3 Period $\frac{2\pi}{3}$

Phase shift $-\frac{\pi}{3}$

Vertical shift 2 Flip no

each = $\frac{\pi}{6}$

$$\frac{2\pi}{3} \cdot \frac{1}{4} = \frac{\pi}{6}$$



8. $y = -\sin 2\left(\theta + \frac{\pi}{2}\right) - 3$

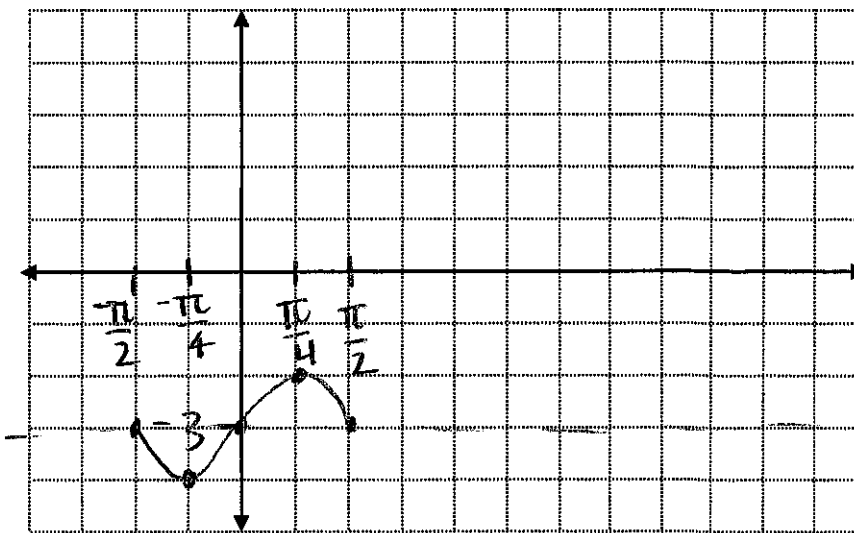
amplitude (a) = 1

b = 2 Period π

Phase shift $-\frac{\pi}{2}$

Vertical shift -3 Flip yes

each = $\frac{\pi}{4}$



9. $y = \cos\left(\theta - \frac{\pi}{3}\right) - 2$

amplitude (a) = 1

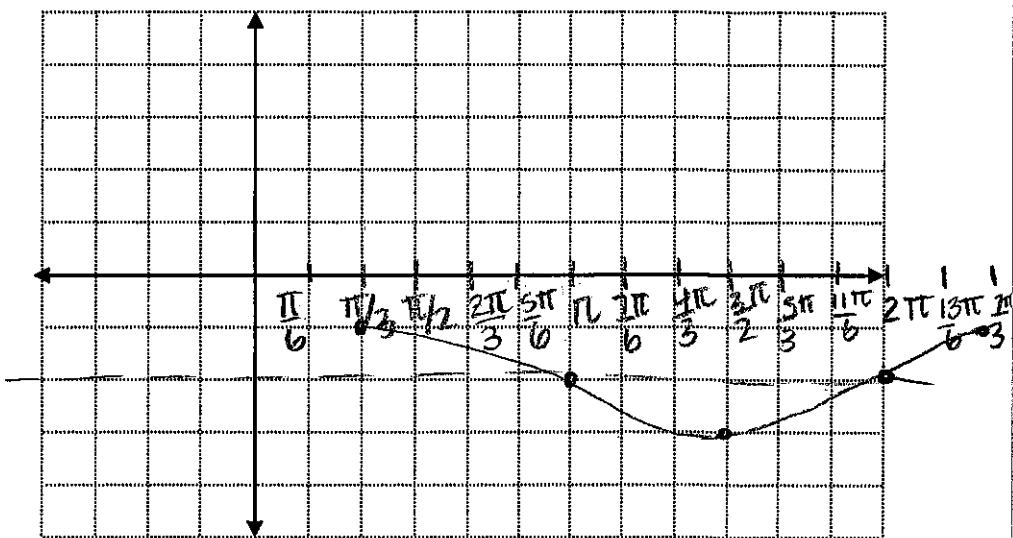
b = 1 Period 2π

Phase shift $\frac{\pi}{3}$

Vertical shift -2 Flip no

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

common denominator 6



10. $y = -3 \cos(\theta + \pi) + 1$

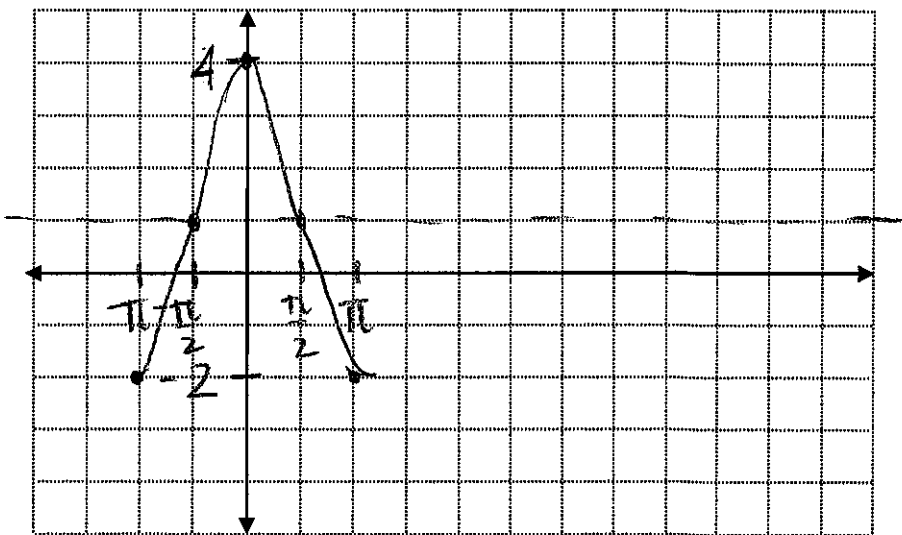
amplitude (a) = 3

b = 1 Period 2π

Phase shift $-\pi$

Vertical shift 1 Flip yes

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



11. $y = \cos 2\left(\theta - \frac{\pi}{2}\right) + 4$

amplitude (a) = 1

b = 2 Period π

Phase shift $\frac{\pi}{2}$

Vertical shift 4 Flip no

each $\frac{\pi}{4}$

