

True or False.

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

- a. The above graph reflects across the x-axis. false
- b. The above graph will have a phase shift to the right. false
- c. The above graph will have a positive vertical shift. false

2.  $y = 5\cos(-2\theta) - 3$   $y = 5\cos(2\theta) - 3$

- a. The above graph reflects across the x-axis. false
- b. The above graph will have a phase shift to the right. false
- c. The above graph will have a positive vertical shift. false

Provide the requested information for each of the following.

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

- a. Period: 4 Period  $\frac{2\pi}{\pi/2} = 2\pi \cdot \frac{2}{\pi} = 4$
  - b. Domain: [-1, 3] Domain  $\frac{\pi}{2}x + \frac{\pi}{2} = 0$   $\frac{\pi}{2}x + \frac{\pi}{2} = 2\pi$
  - c. Phase Shift: -1  $\left(\frac{2}{\pi}\right)\frac{\pi}{2}x = -\frac{\pi}{2}\left(\frac{2}{\pi}\right)$   $\frac{\pi}{2}x = \frac{4\pi}{2} - \frac{\pi}{2}$
  - d. Range: [-5, 1]  $X = -1$   $\left(\frac{2}{\pi}\right)\frac{\pi}{2}x = \frac{3\pi}{2}\left(\frac{2}{\pi}\right)$
- $x = 3$

4.  $y = 5\cos(-2\theta) - 3$   $y = 5\cos(2\theta) - 3$

- a. Period: 180° Period  $\frac{360}{2} = 180^\circ$
- b. Domain: [0, 180°]
- c. Phase Shift: 0°
- d. Range: [-8, 2]

5. Graph one period.

$$y = 2 \cos\left(\frac{2}{3}\theta - 30^\circ\right) - 2$$

$$\text{amp} = 2$$

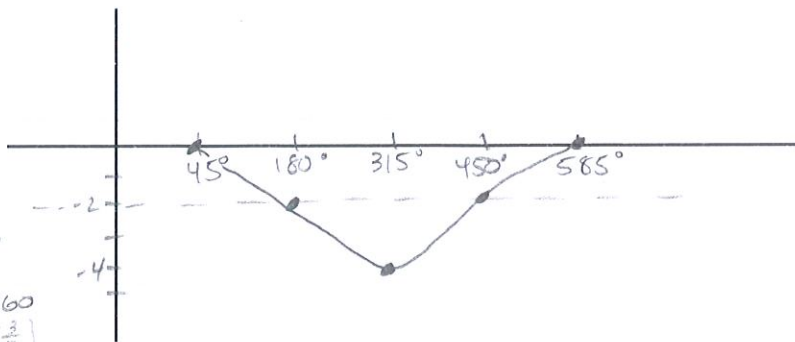
$$\text{period} = \frac{360}{2/3} = 360 \cdot \frac{3}{2} = 540^\circ$$

$$\frac{2}{3}\theta - 30^\circ = 0$$

$$\frac{2}{3}\theta - 30 = 360$$

$$\frac{2}{3}\theta = 30 \quad \theta = 45^\circ$$

$$\frac{2}{3}\theta = 390 \quad \theta = 585^\circ$$



a. What is the range?  $[-4, 0]$

b. Using your answer to part a, how could you find the vertical shift?

Find the average between -4 and 0.  $-\frac{4+0}{2} = -2$

c. What is the domain?  $[45^\circ, 585^\circ]$

d. Using your answer to part c, how could you find the period?

$$585 - 45 = 540^\circ$$

e. Using the range... What is the maximum value?  $0$

What is the minimum value?  $-4$  What is the horizontal axis?  $y = -2$

f. Using your answer to part e, how could you find the amplitude?

$$\frac{\text{max} - \text{min}}{2} = \frac{0 - (-4)}{2} = 2$$

Provide the requested information for each of the following.

6. If the range of a sine function is  $[12, 56]$ , what is the vertical shift? (take the average)

$$\frac{12 + 56}{2} = \frac{68}{2} = 34$$

7. If the range of a cosine function is  $[-14, 6]$ , what is the vertical shift? (take the average)

$$\frac{-14 + 6}{2} = \frac{-8}{2} = -4$$

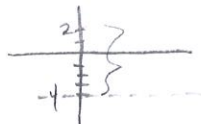
8. If the domain of a cosine function is  $\left[\frac{\pi}{2}, \frac{9\pi}{4}\right]$ , what is the period? (subtract)

$$\frac{9\pi}{4} - \frac{\pi}{2} = \frac{9\pi}{4} - \frac{2\pi}{4} = \frac{7\pi}{4}$$

9. If the domain of a sine function is  $[\pi, 8\pi]$ , what is the period? (subtract)

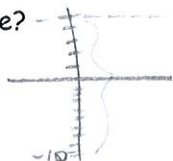
$$8\pi - \pi = 7\pi$$

10. If the horizontal axis of a cosine function is at  $y = -4$  and the maximum value is at 2, then what is the amplitude?



$$2 - (-4) = 6$$

11. If the horizontal axis of a sine function is at  $y = 5$  and the minimum value of the function is at -10, then what is the amplitude?



$$5 - (-10) = 15$$