

True or False.

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

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

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

- a. Period: 4
- b. Domain: [-1, 3]
- c. Phase Shift: -1
- d. Range: [-5, 1]

$$\text{period} = \frac{2\pi}{\frac{\pi}{2}} = 2\pi \cdot \frac{2}{\pi}$$

$$\frac{\pi}{2}x + \frac{\pi}{2} = 0 \quad \frac{\pi}{2}x + \frac{\pi}{2} = 2\pi$$

$$\frac{2 \cdot \frac{\pi}{2}}{\pi} x = -\frac{\pi}{2} \cdot \frac{2}{\pi} \quad \frac{\pi}{2}x = \frac{3\pi}{2}$$

$$x = -1 \quad x = 3$$

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

- a. Period: 180°
- b. Domain: [0°, 360°]
- c. Phase Shift: 0°
- d. Range: [-8, 2]

$$\frac{360^\circ}{2} = 180^\circ$$

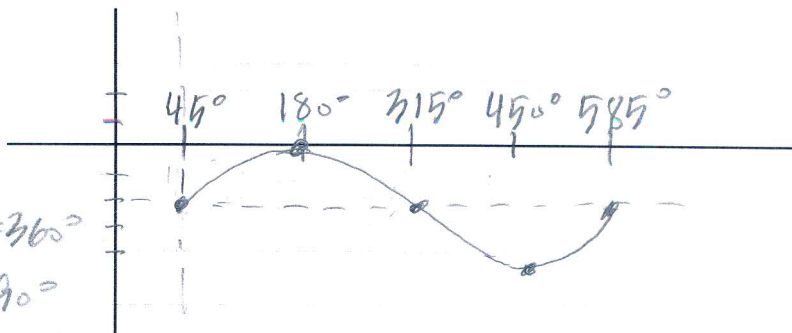
$$2\theta = 0^\circ \quad 2\theta = 360^\circ$$

$$\theta = 0^\circ \quad \theta = 180^\circ$$

5. Graph one period.

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

$$\begin{aligned} \frac{2}{3}\theta - 30^\circ &= 0 & \frac{2}{3}\theta - 30^\circ &= 360^\circ \\ \frac{2}{3}\theta &= 30^\circ & \frac{2}{3}\theta &= 390^\circ \\ \theta &= 45^\circ & \theta &= 585^\circ \end{aligned}$$



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

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

find the midway value (average)

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

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

subtract

e. 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?

$$\frac{\text{max} - \text{min}}{2}$$

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?

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

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

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

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

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

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

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

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?

$$10 - 5 = 5$$