

Provide the requested information for each of the following.

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

a. Period: $\frac{2\pi}{\pi/4} = 2\pi \cdot \frac{4}{\pi} = 8$

b. Domain: $[-2, 6]$

c. Phase Shift: -2

d. Range: $[-1, 5]$

e. Reflect across x-axis? yes

f. Vertical Shift: 2

g. Amplitude: 3

2. $y = -2\cos(-3\theta) - 1 \Rightarrow y = -2\cos(3\theta) - 1$

a. Period: $\frac{360}{3} = 120^\circ$

b. Domain: $[0, 120^\circ]$

c. Phase Shift: none

d. Range: $[-3, 1]$

e. Reflect across x-axis? yes

f. Vertical Shift: -1

g. Amplitude: 2

$\frac{\pi}{4}x + \frac{\pi}{2} = 0$

$\frac{\pi}{4}x = -\frac{\pi}{2} \left(\frac{4}{\pi}\right)$

$x = -2$

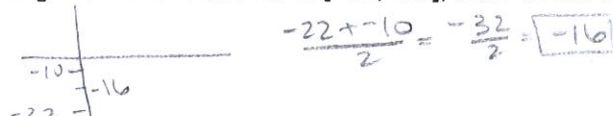
$\frac{\pi}{4}x + \frac{\pi}{2} = 2\pi$

$\frac{\pi}{4}x = \frac{4\pi}{2} - \frac{\pi}{2}$

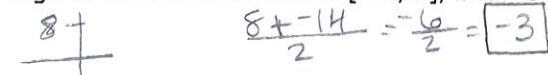
$\frac{\pi}{4}x = \frac{3\pi}{2} \left(\frac{4}{\pi}\right) = 6$

Provide the requested information for each of the following.

3. If the range of a sine function is $[-22, -10]$, what is the vertical shift?



4. If the range of a cosine function is $[-14, 8]$, what is the vertical shift?



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

$\frac{9\pi}{2} - \frac{\pi}{4} = \frac{18\pi}{4} - \frac{\pi}{4} = \frac{17\pi}{4}$

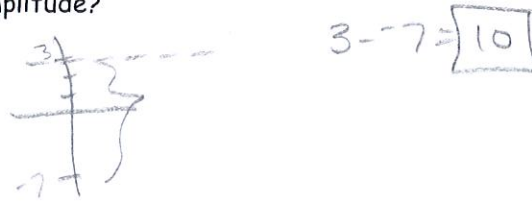
6. If the domain of a sine function is $[-\pi, 5\pi]$, what is the period?

$5\pi - (-\pi) = 6\pi$

7. If the horizontal axis of a cosine function is at $y = -2$ and the maximum value is at 6, then what is the amplitude?

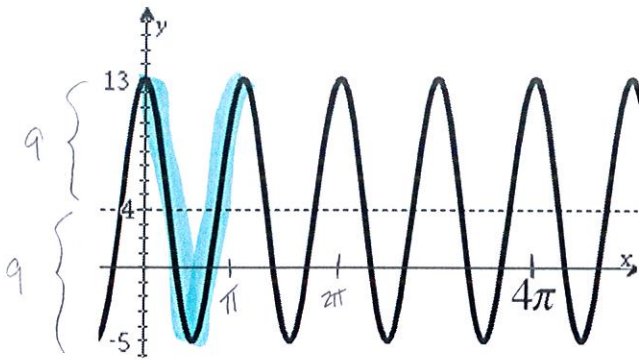


8. If the horizontal axis of a sine function is at $y = 3$ and the minimum value of the function is at -7, then what is the amplitude?



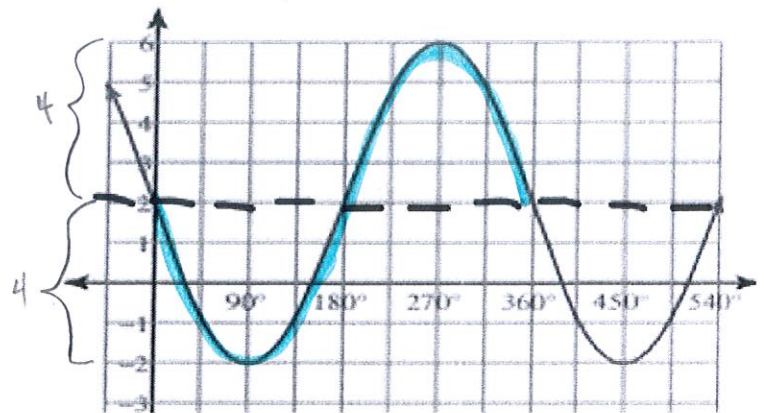
Provide the requested information for each of the following.

9. Cosine Graph -



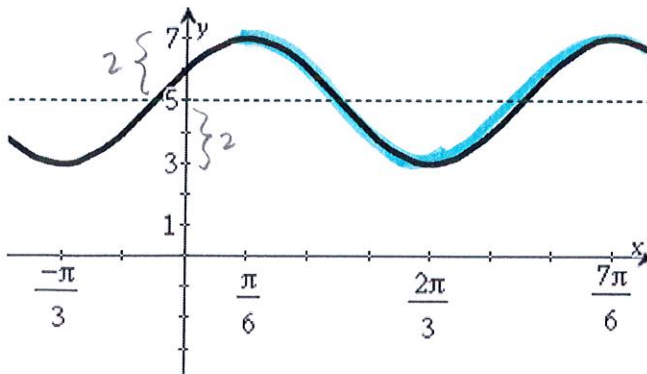
- a. Amplitude: 9
- b. Reflect across x-axis? no
- c. Phase Shift: none
- d. Domain: $[0, \pi]$
- e. Period: π
- f. Vertical Shift: 4
- g. Range: $[-5, 13]$

10. Sine Graph -



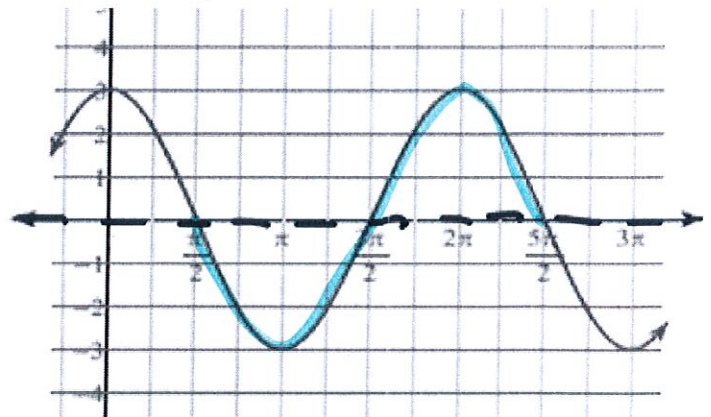
- a. Amplitude: 4
- b. Reflect across x-axis? yes
- c. Phase Shift: none
- d. Domain: $[0, 360^\circ]$
- e. Period: 360°
- f. Vertical Shift: 2
- g. Range: $[-2, 6]$

11. Cosine Graph



- a. Amplitude: 2
- b. Reflect over horizontal axis? no
- c. Phase Shift: $\frac{\pi}{6}$
- d. Domain: $[\frac{\pi}{6}, \frac{7\pi}{6}]$
- e. Period: $\frac{7\pi}{6} - \frac{\pi}{6} = \frac{6\pi}{6} = \pi$
- f. Vertical Shift: 5
- g. Range: $[3, 7]$

12. Sine Graph



- a. Amplitude: 3
- b. Reflect over horizontal axis? yes
- c. Phase Shift: $\frac{\pi}{2}$
- d. Domain: $[\frac{\pi}{2}, \frac{5\pi}{2}]$
- e. Period: $\frac{5\pi}{2} - \frac{\pi}{2} = \frac{4\pi}{2} = 2\pi$
- f. Vertical Shift: none
- g. Range: $[-3, 3]$