

10.3 HW: Period and Phase Shift of Sine and Cosine

Write an equation for each function described below.

1. Sine function

Amplitude 3
 Reflected across x-axis
 Shifted up 2 units
 Period 2π

$$y = -3\sin\theta + 2$$

2. Cosine function

Amplitude 2
 Shifted left 2 units
 Shifted up 4 units
 Period $\frac{\pi}{2}$

$$y = 2\cos(4(\theta + 2)) + 4$$

3. Sine function

Amplitude 1
 Shifted down 5 units
 Shifted right π units
 Period $\frac{\pi}{4}$

$$y = \sin(8(\theta - \pi)) - 5$$

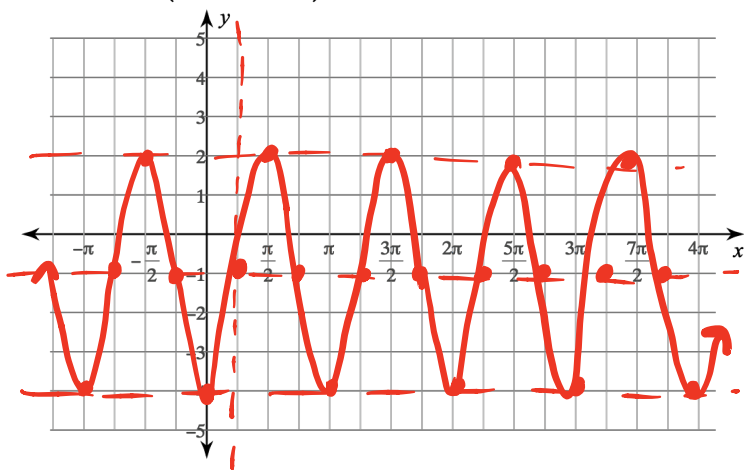
4. Cosine function

Amplitude 0.5
 Shifted right $\frac{\pi}{6}$
 Shifted down π units
 Period 6π

$$y = 0.5\cos\left(\frac{1}{3}\left(\theta - \frac{\pi}{6}\right)\right) - \pi$$

Find the indicated information. Then sketch a graph of the function.

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



Amplitude: 3

Period: π

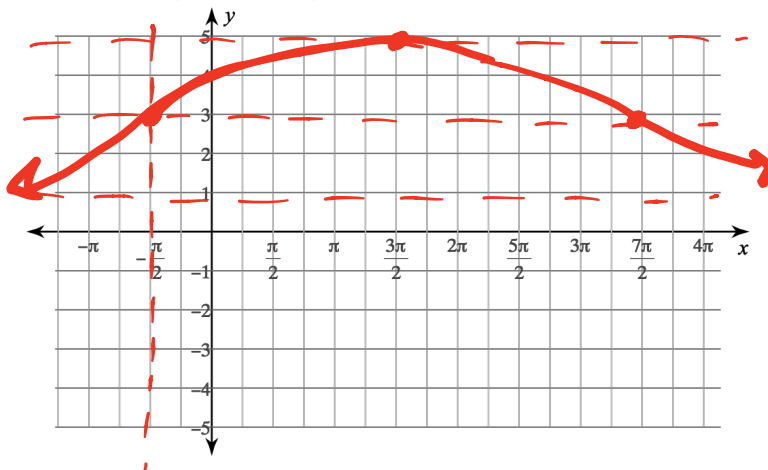
Phase Shift: Right $\pi/4$

Midline: $y = -1$

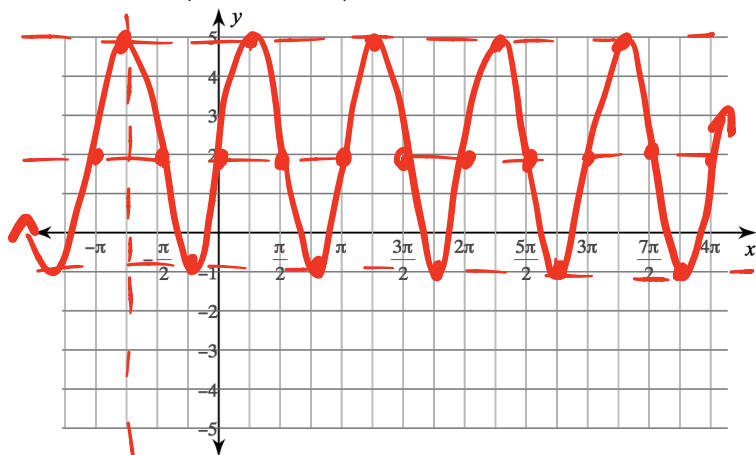
Domain: $(-\infty, \infty)$

Range: $[-4, 2]$

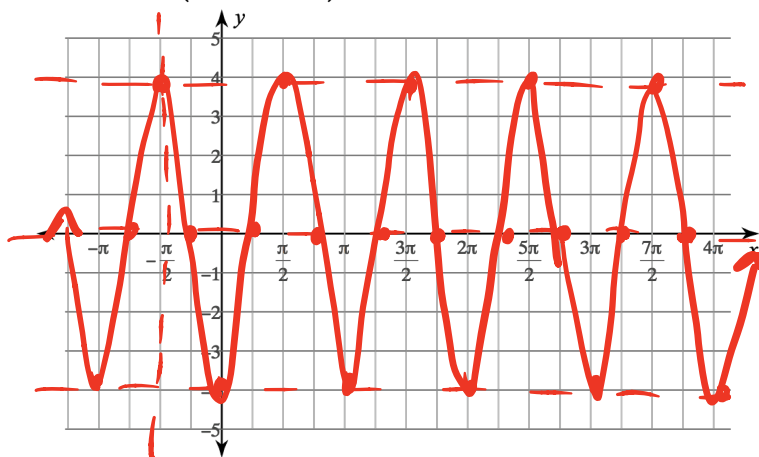
6. $y = 2 \sin\left(\frac{1}{4}\left(\theta + \frac{\pi}{2}\right)\right) + 3$

Amplitude: 2Period: 8π Phase Shift: left $\pi/2$ Midline: $y = 3$ Domain: $(-\infty, \infty)$ Range: $[1, 5]$

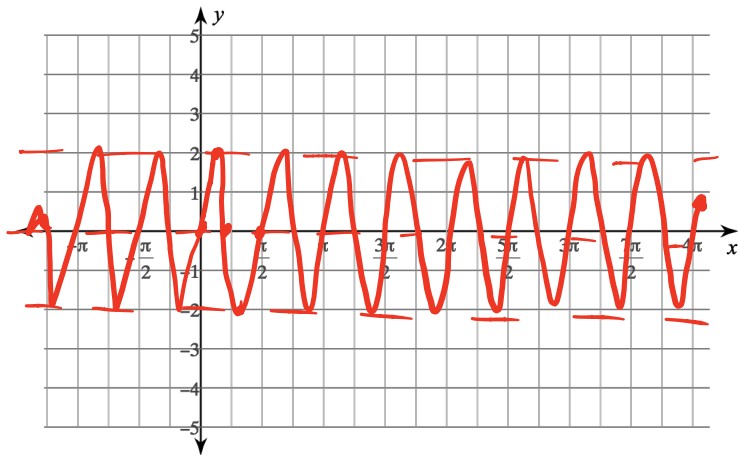
7. $y = 3 \cos\left(2\left(\theta + \frac{3\pi}{4}\right)\right) + 2$

Amplitude: 3Period: π Phase Shift: left $3\pi/4$ Midline: $y = 2$ Domain: $(-\infty, \infty)$ Range: $[-1, 5]$

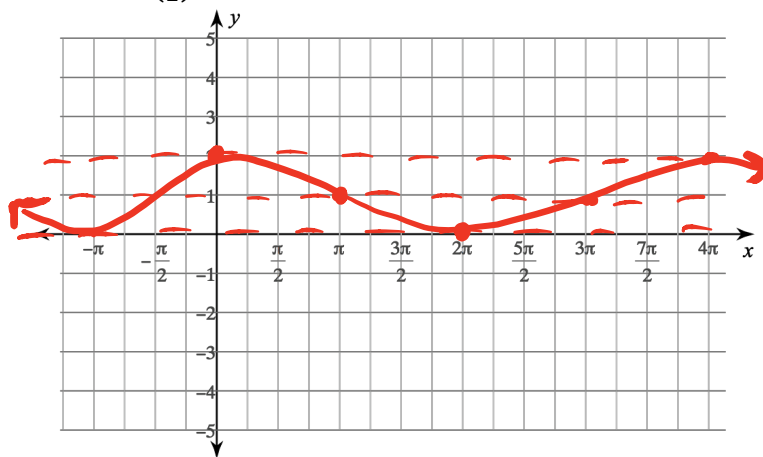
8. $y = 4 \sin\left(2\left(\theta + \frac{\pi}{2}\right)\right)$

Amplitude: 4Period: π Phase Shift: left $\pi/2$ Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-4, 4]$

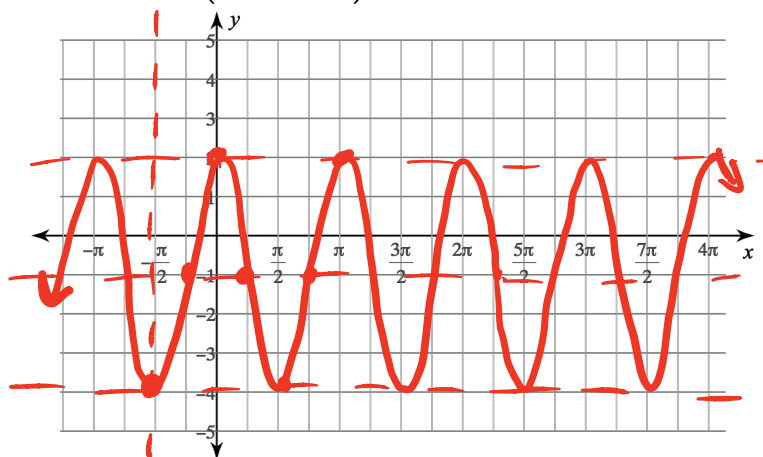
9. $y = 2 \sin 4\theta$

Amplitude: 2Period: $\pi/2$ Phase Shift: N/AMidline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-2, 2]$

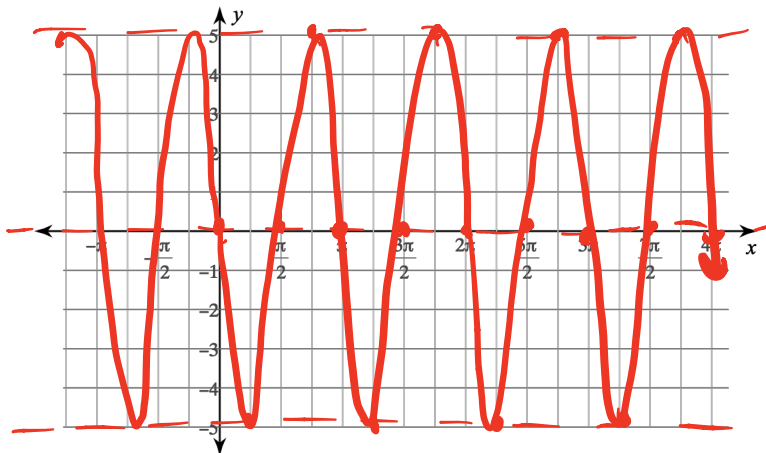
10. $y = \cos\left(\frac{\theta}{2}\right) + 1$

Amplitude: 1Period: 4π Phase Shift: N/AMidline: $y = 1$ Domain: $(-\infty, \infty)$ Range: $[0, 2]$

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

Amplitude: 3Period: π Phase Shift: left $\pi/2$ Midline: $y = -1$ Domain: $(-\infty, \infty)$ Range: $[-4, 2]$

12. $y = -5\sin(2\theta)$



Amplitude: 5

Period: π

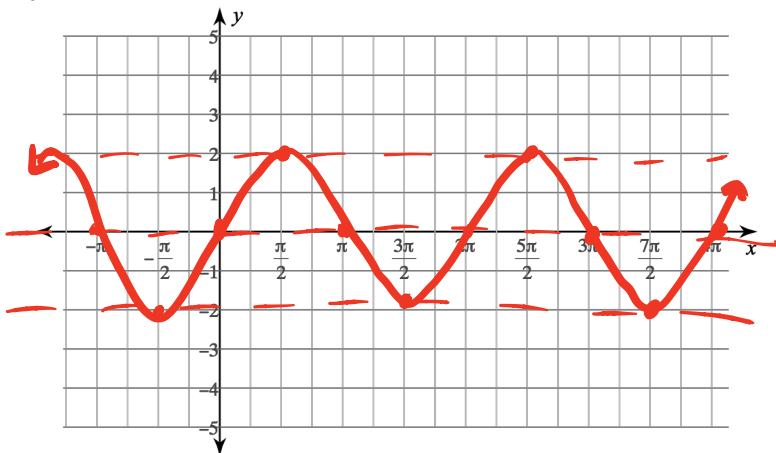
Phase Shift: N/A

Midline: $y = 0$

Domain: $(-\infty, \infty)$

Range: $[-5, 5]$

13. $y = 2\sin(\theta)$



Amplitude: 2

Period: 2π

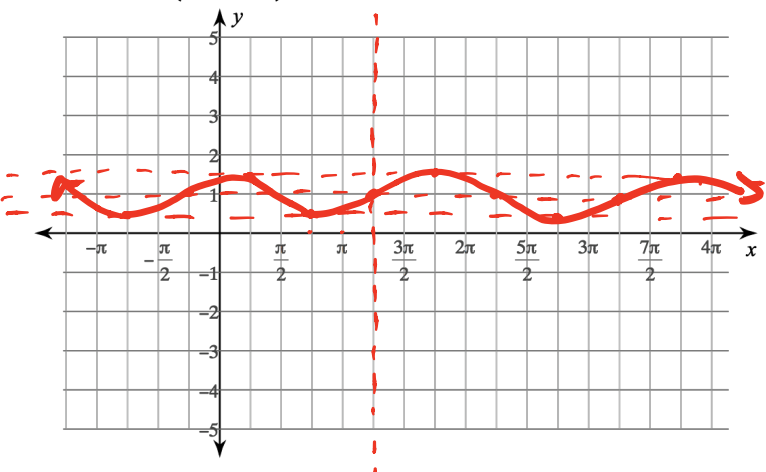
Phase Shift: N/A

Midline: $y = 0$

Domain: $(-\infty, \infty)$

Range: $[-2, 2]$

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



Amplitude: $\frac{1}{2}$

Period: 2π

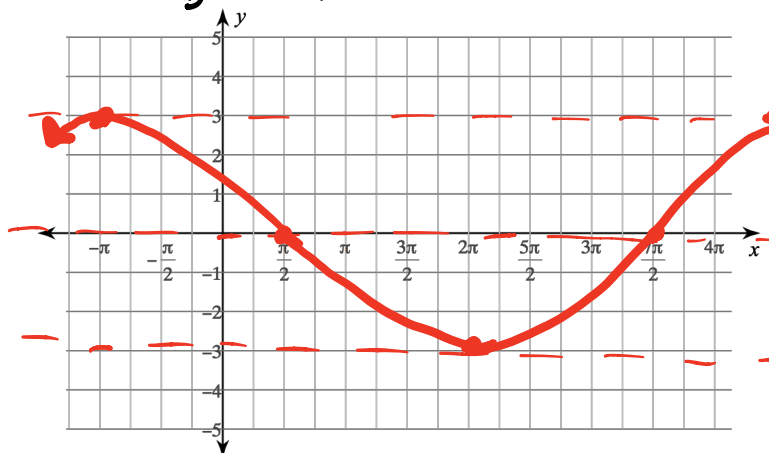
Phase Shift: Right $5\pi/4$

Midline: $y = 1$

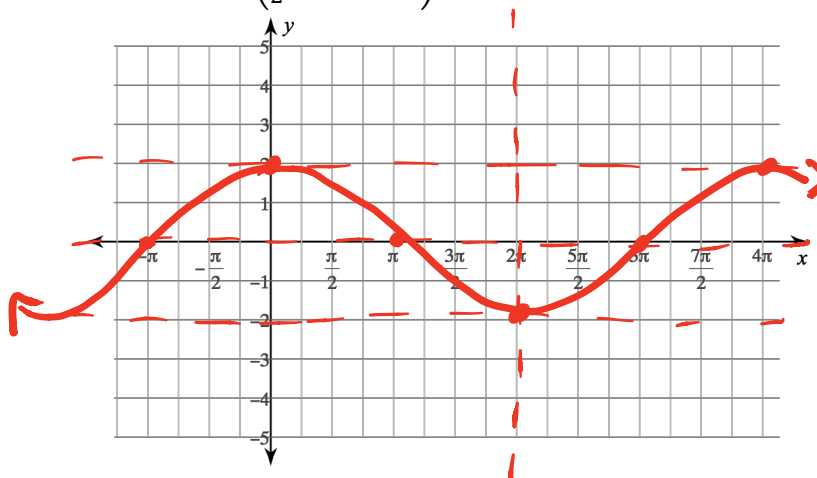
Domain: $(-\infty, \infty)$

Range: $[0.5, 1.5]$

15. $y = 3 \cos\left(\frac{1}{3}(\theta + \pi)\right)$

Amplitude: 3Period: 6π Phase Shift: left π Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-3, 3]$

16. $y = -2 \cos\left(\frac{1}{2}(\theta - 2\pi)\right)$

Amplitude: 2Period: 4π Phase Shift: Right 2π Midline: $y = 0$ Domain: $(-\infty, \infty)$ Range: $[-2, 2]$