

Precalculus
4.5 Homework - Odd Answers

1. 1 3. $-\frac{\sqrt{2}}{2}$ 5. 0 7. -2 9. $-\frac{\sqrt{2}}{2}$
11. $\left(-\frac{\pi}{12}, -2\right)$ 13. $\left(\frac{\pi}{2}, 1\right)$ 15. $\left(\frac{\pi}{6}, -2\right)$
17. $P(0,1), Q\left(\frac{\pi}{6}, 3\right), R\left(\frac{\pi}{3}, 1\right), S\left(\frac{\pi}{2}, -1\right)$ 19. $P\left(-\frac{\pi}{8}, 0\right), Q\left(\frac{\pi}{8}, 2\right), R\left(\frac{3\pi}{8}, 0\right), S\left(\frac{5\pi}{8}, -2\right)$

21.
amplitude: 1

phase shift: right $\frac{\pi}{3}$

period: 2π

midline: $y = 0$

range: $[-1, 1]$

23.
amplitude: 1

phase shift: 0

period: 2π

midline: $y = -1$

range: $[-2, 0]$

25.
amplitude: 2

phase shift: right $\frac{\pi}{6}$

period: 2π

midline: $y = 1$

range: $[-1, 3]$

27.
amplitude: 2

phase shift: right $\frac{\pi}{3}$

period: 2π

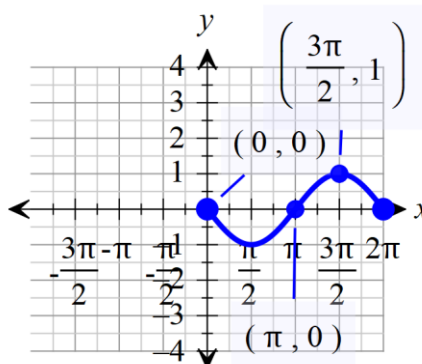
midline: $y = 1$

range: $[-1, 3]$

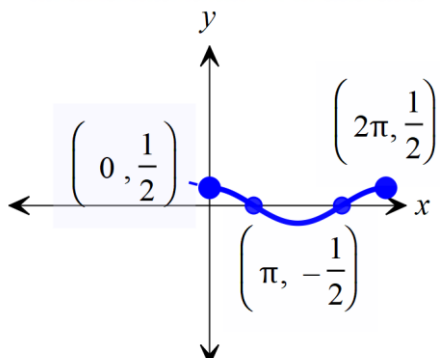
29. $y = 2\cos(x - \pi) + 1$ or $y = -2\cos x + 1$ or $y = -2\cos(x - 2\pi) + 1$ or many others

31. $y = -3\cos\left(x + \frac{\pi}{4}\right) - 5$

32.
Vertical shift (midline): 0 or $y = 0$
Amplitude: 1
Phase shift: none
Period: 2π
Range: $[-1, 1]$



33.



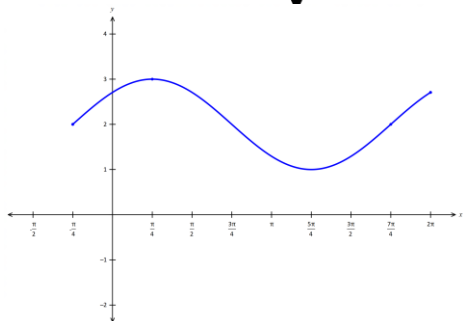
Points: $\left(0, \frac{1}{2}\right), \left(\frac{\pi}{2}, 0\right), \left(\pi, -\frac{1}{2}\right), \left(\frac{3\pi}{2}, 0\right), \left(2\pi, \frac{1}{2}\right)$

Vertical shift (midline): $y = 0$

Amplitude: $.5$ or $\frac{1}{2}$ phase shift: none or 0

Period: 2π Range: $\left[-\frac{1}{2}, \frac{1}{2}\right]$

35.



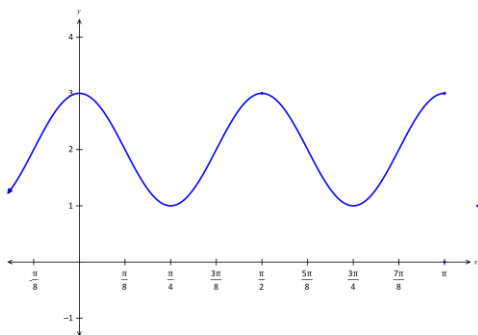
Points: $\left(-\frac{\pi}{4}, 2\right), \left(\frac{\pi}{4}, 3\right), \left(\frac{3\pi}{4}, 2\right), \left(\frac{5\pi}{4}, 1\right), \left(\frac{7\pi}{4}, 2\right)$

Amplitude: 1

Period: 2π phase shift: $-\frac{\pi}{4}$

Vertical Shift (midline): 2 Range: [1,3]

37.



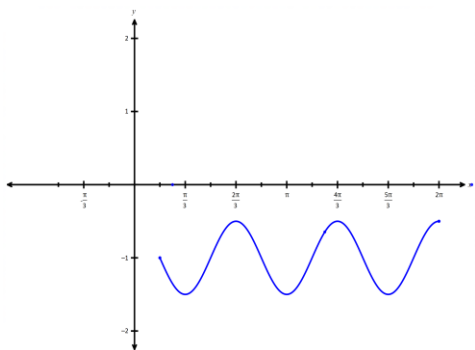
Points: $(0, 3), \left(\frac{\pi}{8}, 2\right), \left(\frac{\pi}{4}, 1\right), \left(\frac{3\pi}{8}, 2\right), \left(\frac{\pi}{2}, 3\right)$

Midline is $y = 2$ Amplitude: 1

Phase Shift $\frac{\pi}{2}$ Period: π

Range: [1,3]

39.



Points: $\left(\frac{\pi}{6}, -1\right), \left(\frac{\pi}{3}, -\frac{3}{2}\right), \left(\frac{2\pi}{3}, -1\right), \left(\frac{5\pi}{3}, -\frac{1}{2}\right), \left(\frac{3\pi}{2}, -1\right)$

Midline: $y = -1$ Amplitude: $1/2$

Phase Shift: $\frac{\pi}{6}$ Period: $\frac{2\pi}{3}$

Vertical Shift: -1 Range: $\left[-\frac{3}{2}, -\frac{1}{2}\right]$

41. Some of the many options:

$$y = 3 \sin \left[\frac{3}{2} (x + \pi/3) \right]$$

$$y = 3 \cos 2x + 3$$

43. 40 cycles/sec

45. 0.000025 seconds

47. $\frac{\pi}{6}$

49. 4.7 cm