Graphing Sine and Cosine

$$y = asin(kx)$$
$$y = \text{acos}\,(kx)$$
$$k > 0$$

Amp $= |a|$ and Period $p = \frac{2\pi}{k}$

Interval of One Cycle $=[0, p]$

Determine the amplitude, period, interval of one cycle, x-intercepts, max value, min value, and use this information to sketch the curve.

1. $y = 3\text{sin}\,(4x)$

2. $y = 2\text{sin}\,(3x)$

3. $y = -\text{sin}\,(\pi x)$

4. $y = -\text{sin}\,(2\pi x)$

5. $y = \frac{1}{3}\text{cos}\,(2\pi x)$

6. $y = \frac{2}{3}\text{cos}\,(-\pi x)$

7. $y = 4\text{sin}\,(2x)$

8. $y = 5\text{sin}\,(3x)$

9. $y = 3\text{cos}\,\left(\frac{x}{2}\right)$

10. $y = 5\text{cos}\,\left(\frac{x}{3}\right)$

11. $y = -2sin\left(\frac{x}{4}\right)$

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

13. $y = -cos\left(\frac{x}{2}\right)$

14. $y = 5cos\left(\frac{x}{4}\right)$

15. $y = \text{sin}\,(4x)$

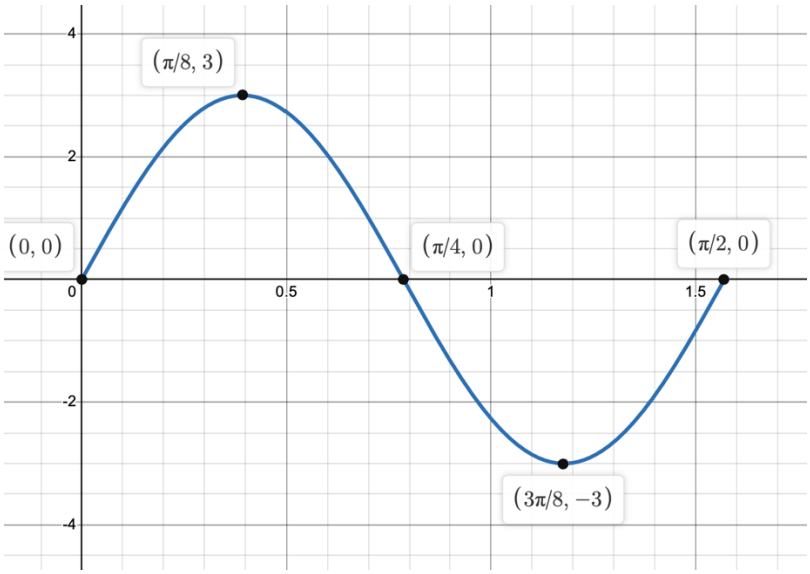
16. $y = \text{sin}(6\pi x)$

17. $y = \text{cos}\,(3\pi x)$

18. $y = \frac{5}{2}\text{cos}\,(-4x)$

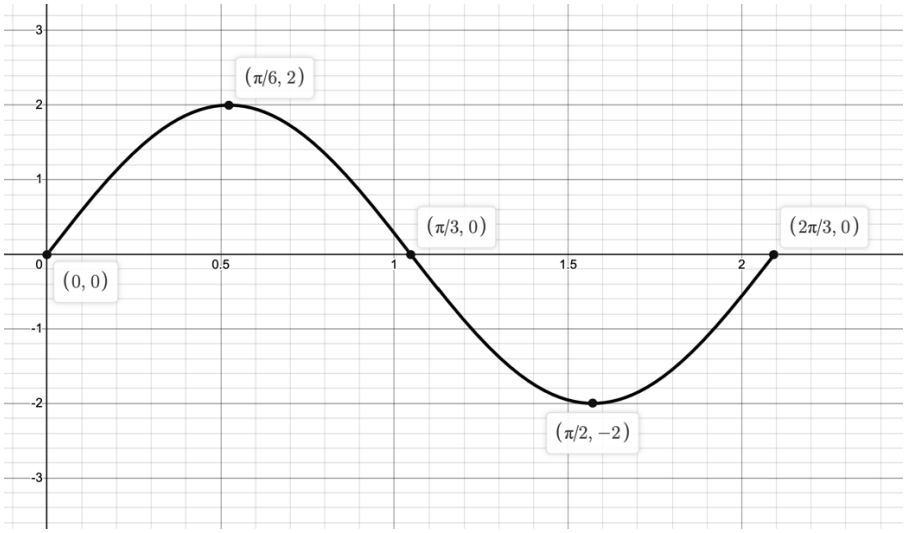
Answers

1.



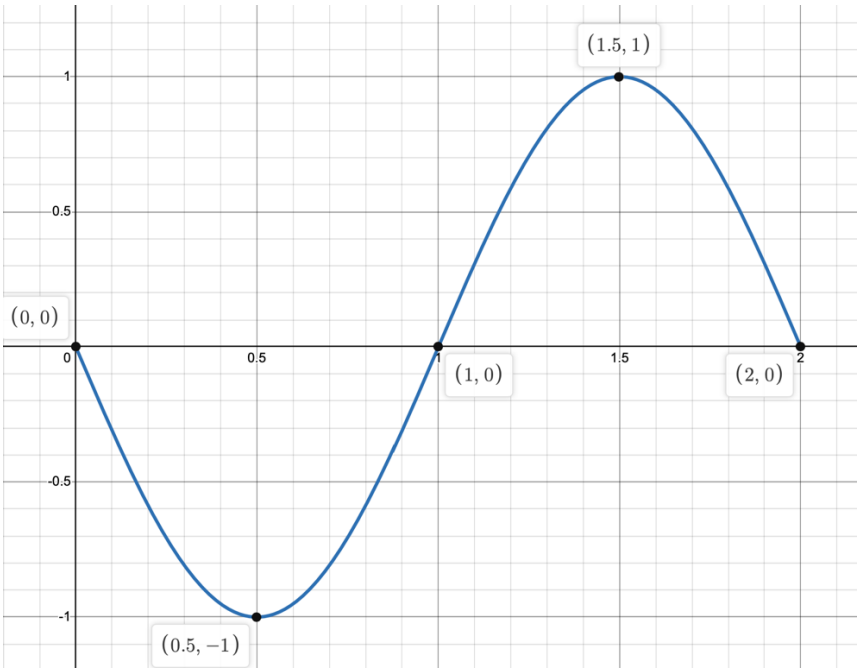
$$amp = 3, period = \frac{\pi}{2}, Interval = \left[0, \frac{\pi}{2}\right], xint: x = 0, x = \frac{\pi}{4}, x = \frac{\pi}{2}$$
$$min = -3, max = 3$$

2.



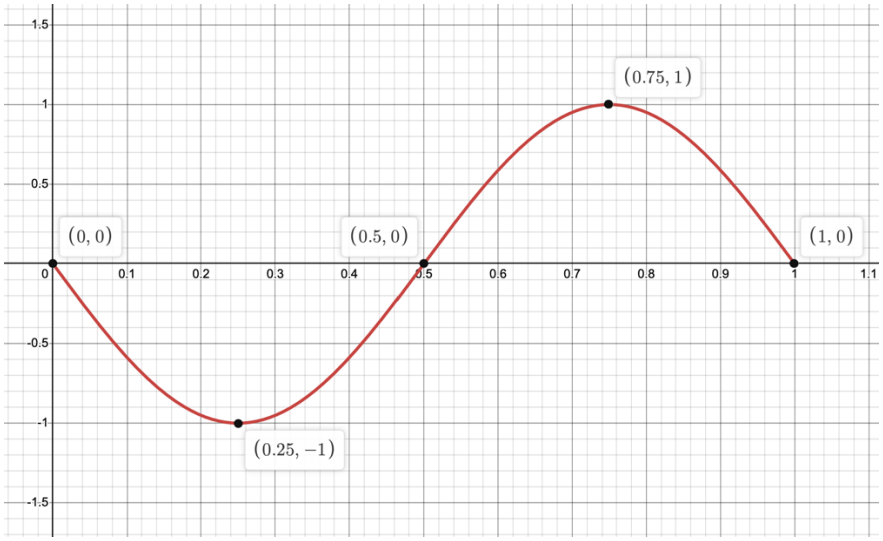
$$amp = 2, period = \frac{2\pi}{3}, Interval = \left[0, \frac{2\pi}{3}\right], xint: x = 0, x = \frac{\pi}{3}, x = \frac{2\pi}{3}$$
$$min = -2, max = 2$$

3.



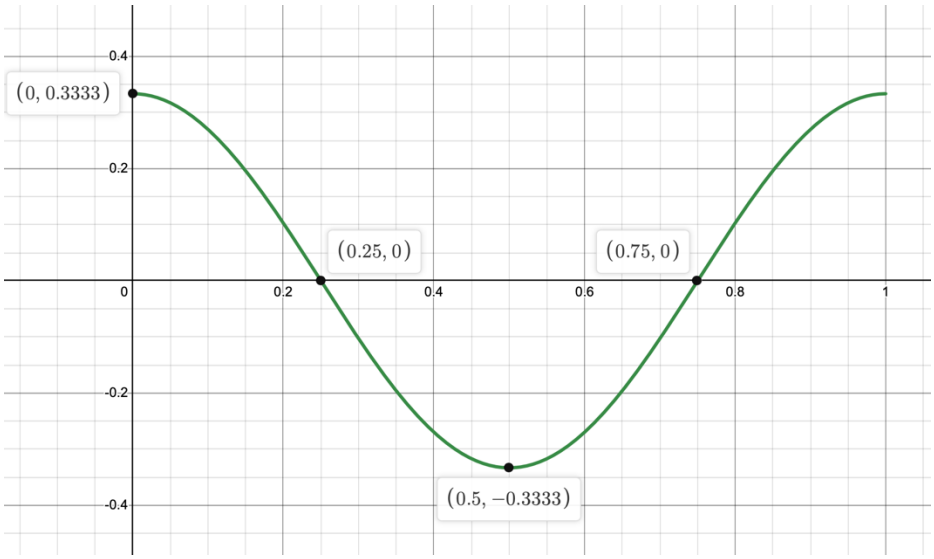
$amp = 1, period = 2, Interval = [0,2], xint: x = 0, x = 1, x = 2$
$min = -1, max = 1$

4.



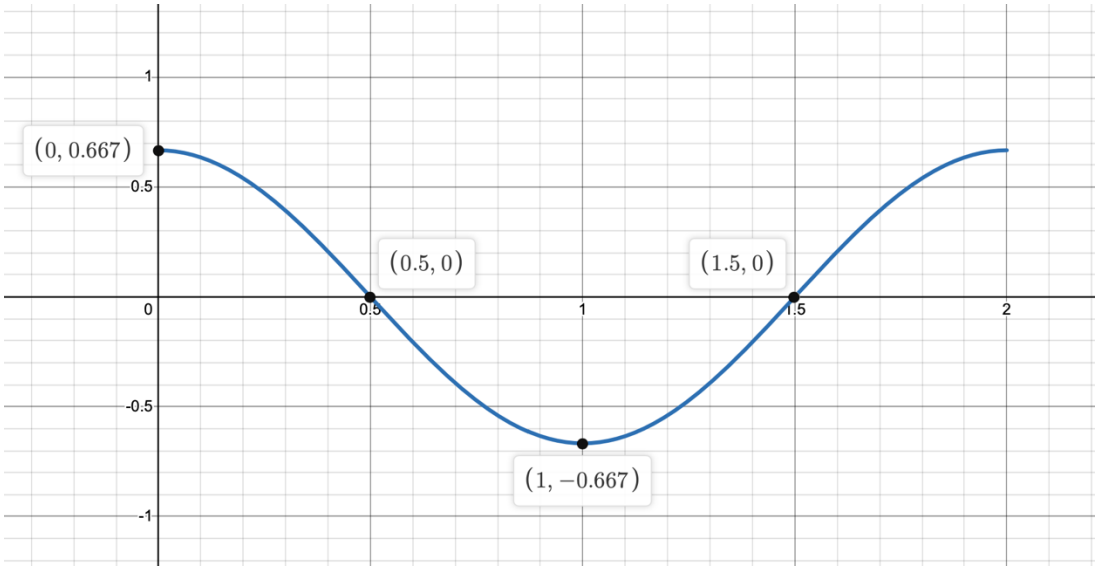
$amp = 1, period = 1, Interval = [0,1], xint: x = 0, x = \frac{1}{2}, x = 1$
$min = -1, max = 1$

5.



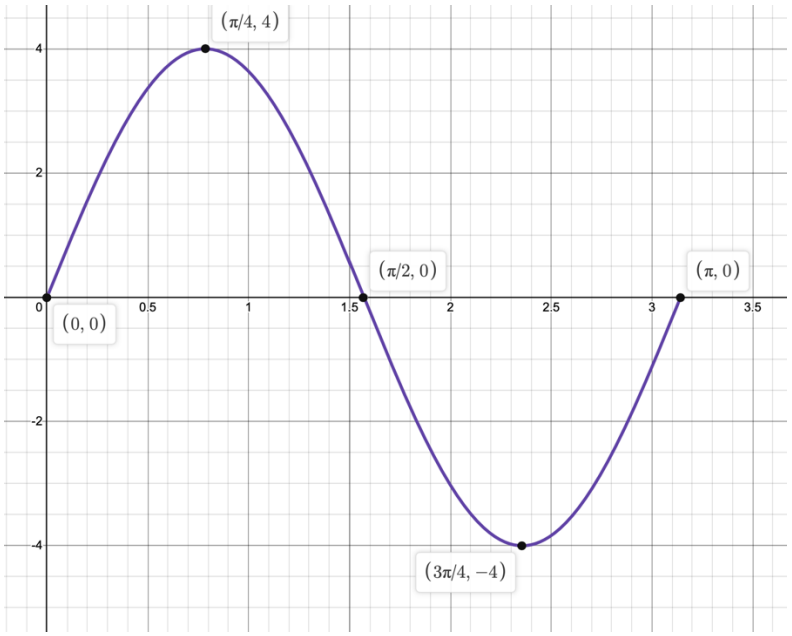
$$amp = \frac{1}{3}, period = 1, Interval = [0,1], xint: x = \frac{1}{4}, x = \frac{3}{4}$$
$$min = -\frac{1}{3}, max = \frac{1}{3}$$

6.



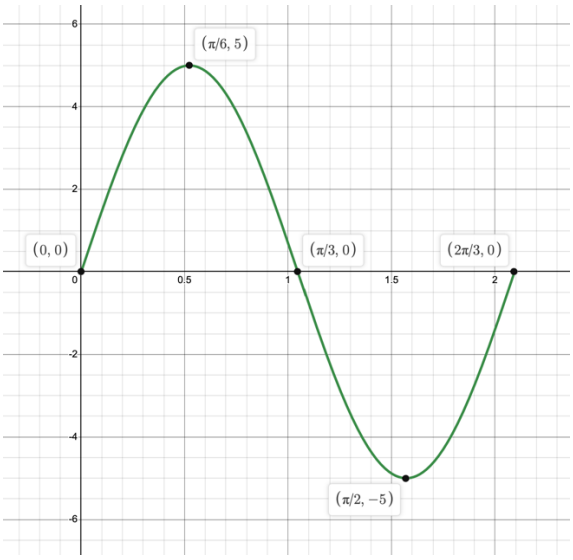
$$amp = \frac{2}{3}, period = 2, Interval = [0,2], xint: x = \frac{1}{2}, x = \frac{3}{2}$$
$$min = -\frac{2}{3}, max = \frac{2}{3}$$

7.



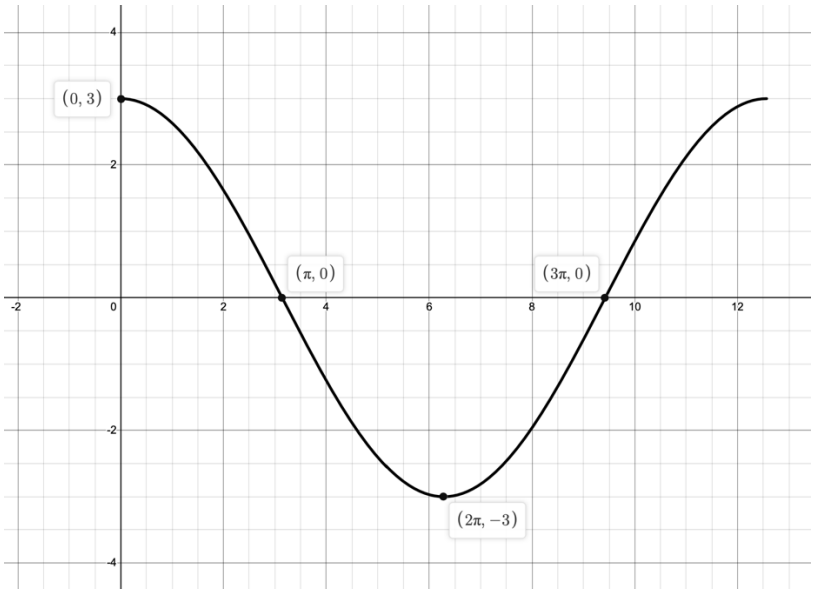
$$amp = 4, period = \pi, Interval = [0, \pi], xint: x = 0, x = \frac{\pi}{2}, x = \pi$$
$$min = -4, max = 4$$

8.



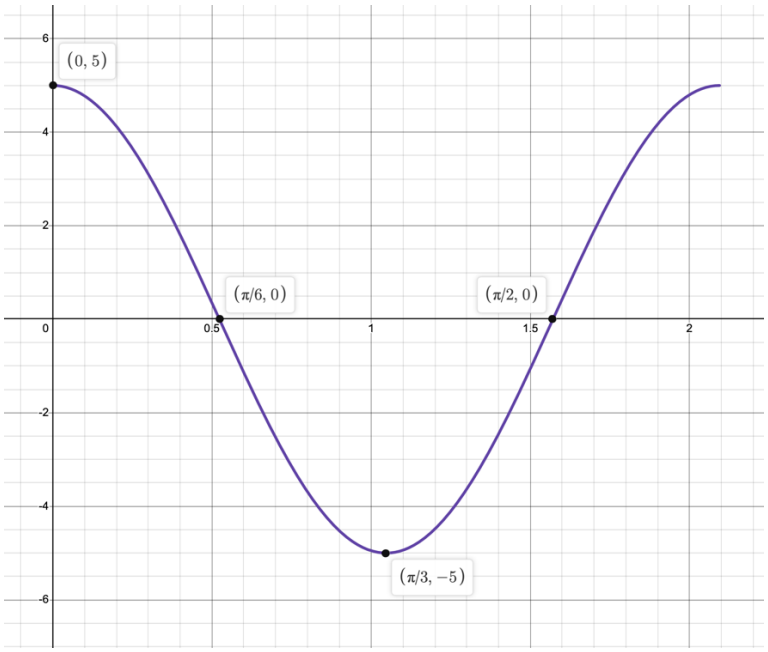
$$amp = 5, period = \frac{2\pi}{3}, Interval = \left[0, \frac{2\pi}{3}\right], xint: x = 0, x = \frac{\pi}{3}, x = \frac{2\pi}{3}$$
$$min = -5, max = 5$$

9.



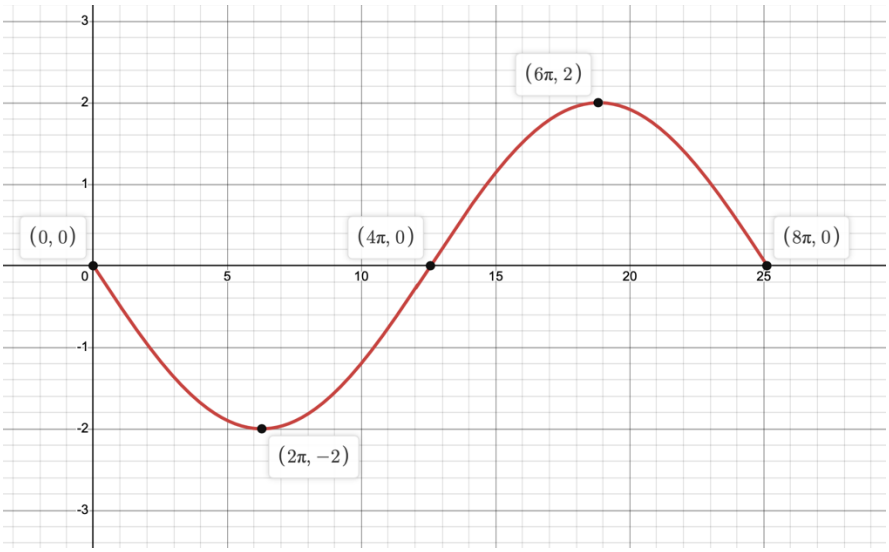
$amp = 3, period = 4\pi, Interval = [0,4\pi], xint: x = \pi, x = 3\pi$
$min = -3, max = 3$

10.



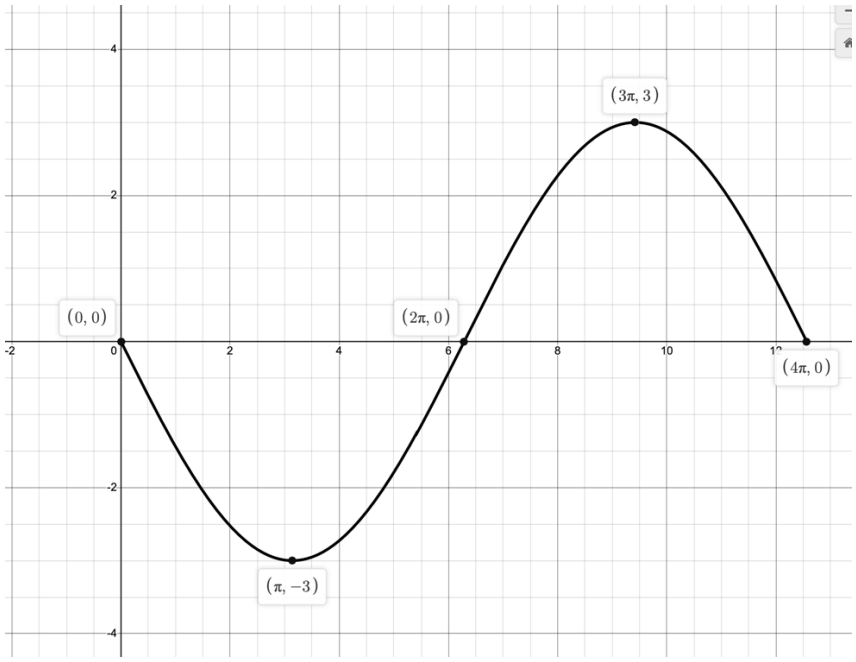
$amp = 5, period = \frac{2\pi}{3}, Interval = \left[0, \frac{2\pi}{3}\right], xint: x = \frac{\pi}{6}, x = \frac{\pi}{2}$
$min = -5, max = 5$

11.



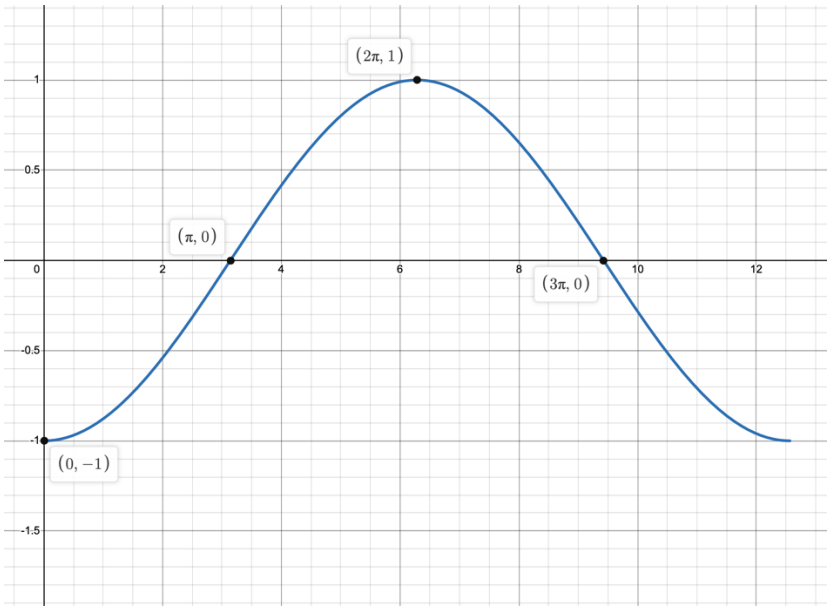
$amp = 2, period = 8\pi, Interval = [0,8\pi], xint: x = 0, x = 4\pi, x = 8\pi$
$min = -2, max = 2$

12.



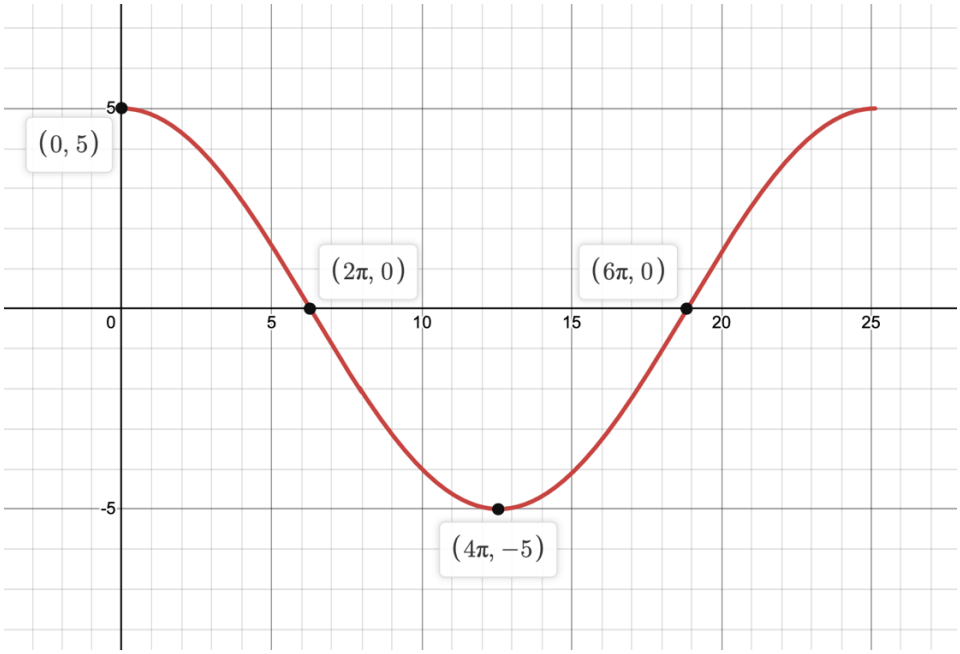
$amp = 3, period = 4\pi, Interval = [0,4\pi], xint: x = 0, x = 2\pi, x = 4\pi$
$min = -3, max = 3$

13.



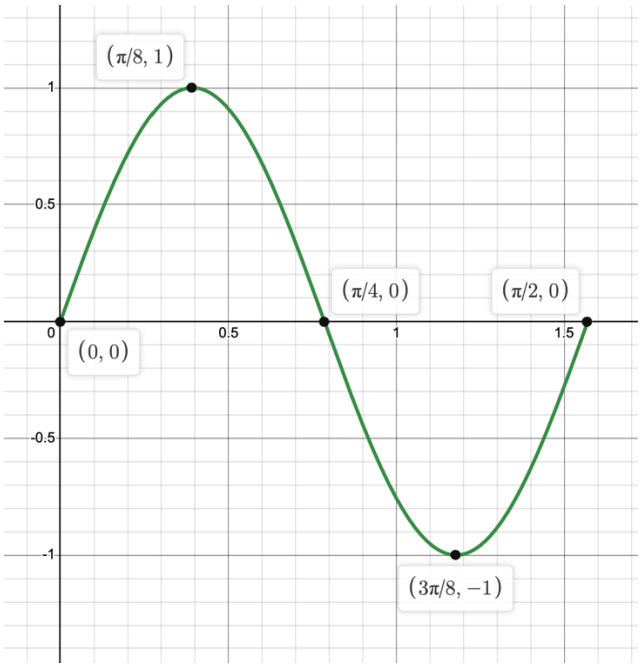
$amp = 1, period = 4\pi, Interval = [0,4\pi], xint: x = \pi, x = 3\pi$
$min = -1, max = 1$

14.



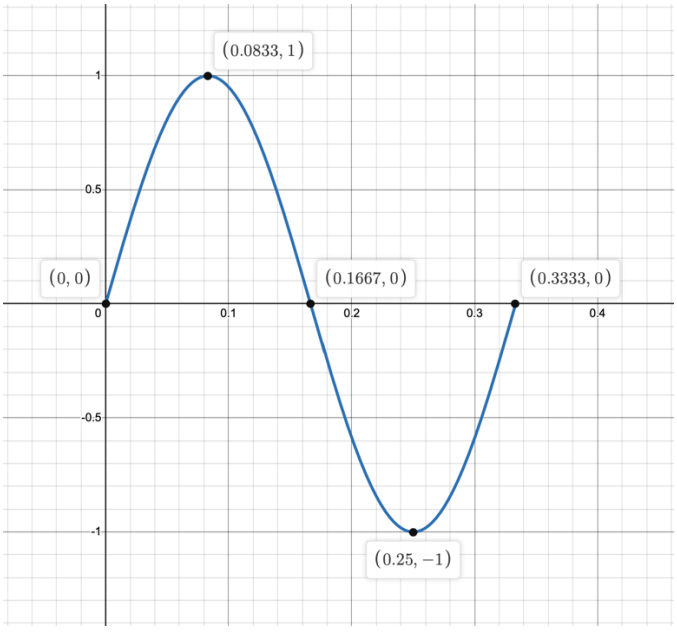
$amp = 5, period = 8\pi, Interval = [0,8\pi], xint: x = 2\pi, x = 6\pi$
$min = -5, max = 5$

15.



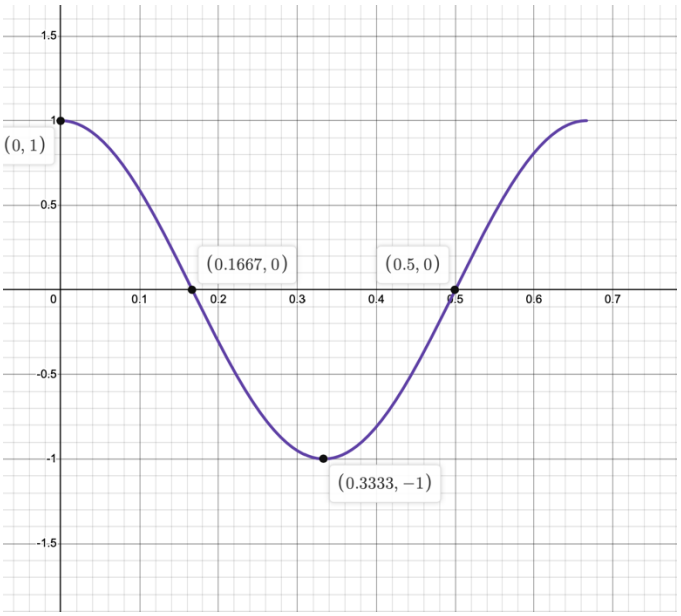
$$amp = 1, period = \frac{\pi}{2}, Interval = \left[0, \frac{\pi}{2}\right], xint: x = 0, x = \frac{\pi}{4}, x = \frac{\pi}{2}$$
$$min = -1, max = 1$$

16.



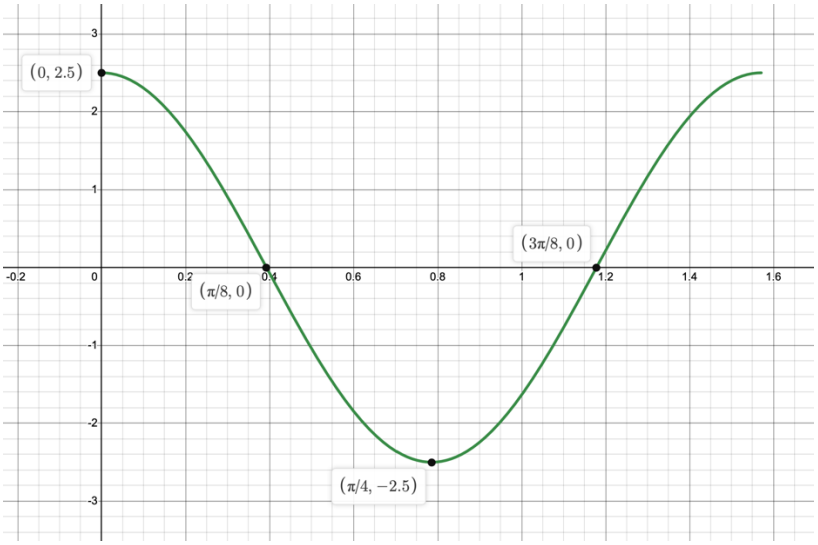
$$amp = 1, period = \frac{1}{3}, Interval = \left[0, \frac{1}{3}\right], xint: x = 0, x = \frac{1}{6}, x = \frac{1}{3}$$
$$min = -1, max = 1$$

17.



$$amp = 1, period = \frac{2}{3}, Interval = \left[0, \frac{2}{3}\right], xint: x = \frac{1}{6}, x = \frac{1}{2}$$
$$min = -1, max = 1$$

18.



$$amp = \frac{5}{2}, period = \frac{\pi}{2}, Interval = \left[0, \frac{\pi}{2}\right], xint: x = \frac{\pi}{8}, x = \frac{3\pi}{8}$$
$$min = -\frac{5}{2}, max = \frac{5}{2}$$