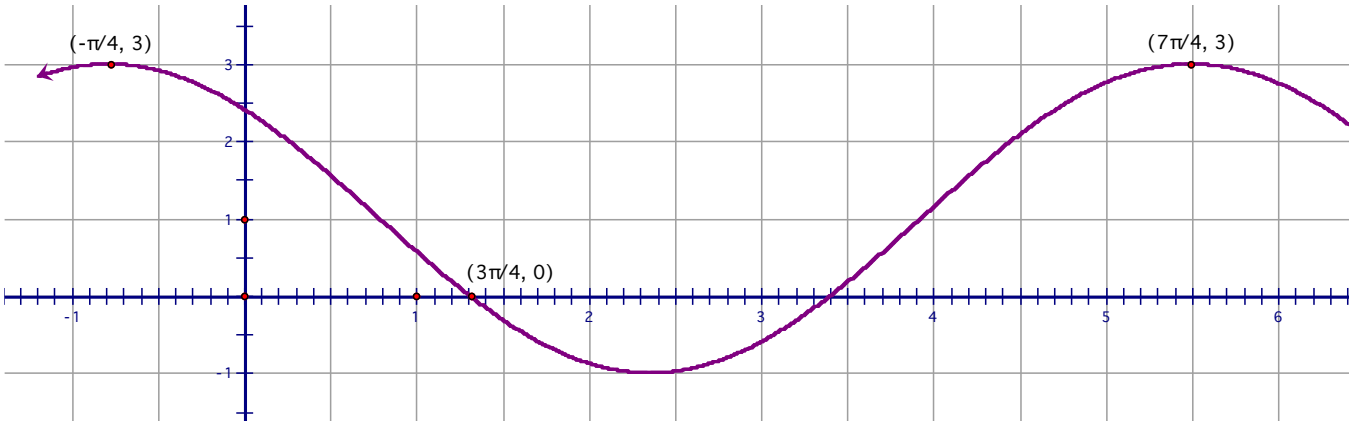
SELECT SOLUTIONS

Homework Title: **Wicked Fun Practice Exercises Part 1**

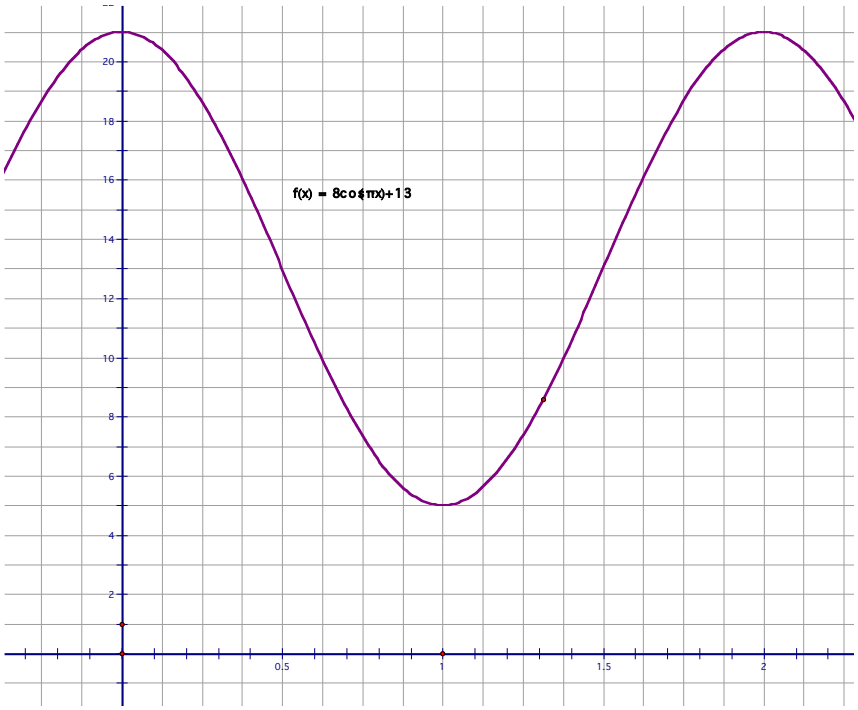
1) Period = 2π, Amp = 2, Axis: y=1



2a) Amp = 4, Axis: y = 2, Period = 4, Equation: $y = 4\cos\left(\frac{\pi}{2}(x-1)\right) + 2$

2b) Amp = 6, Axis: y = -4, Period = 60, Equation: $y = 6\cos\left(\frac{\pi}{30}(x+1)\right) - 4$

3a)



3b) $h = 8\cos(\pi t) + 13$

3c) Sinusoidal functions are periodic functions, so $f(x) = f(x+P)$. Since the period is 2 seconds, 13 seconds is 6 full periods after 1 second. Therefore the height of the pedal at 1 second is the same as the height of the pedal at 13 seconds. $f(1) = f(13) = 5\ inches$

3d) You can solve this by graphing on your calculator and using the intersect feature in the CALC menu.

You can also solve it algebraically (which we'll be doing more of in the next unit). Here's how:

$$17 = 8\cos(\pi t) + 13$$
$$4 = 8\cos(\pi t)$$
$$\frac{1}{2} = \cos(\pi t)$$

Let $\pi t = \theta$

$$\frac{1}{2} = \cos(\theta)$$

Using my unit circle knowledge, $\theta = 60^\circ \; and \; 300^\circ$ which is $\frac{\pi}{3} \; and \; \frac{5\pi}{3}$ in radians

$$\theta = \frac{\pi}{3} \; and \; \frac{5\pi}{3}$$
$$\pi t = \frac{\pi}{3} \; and \; \frac{5\pi}{3}$$
$$t = \frac{1}{3} \; and \; \frac{5}{3} \text{ seconds}$$

3e) Equation: $h = 8\cos\left(\frac{2\pi}{3}t\right) + 13$