Answer the questions in the spaces provided. **Show all of your work and circle the answer you would like to have graded for each question.**

Name: _____
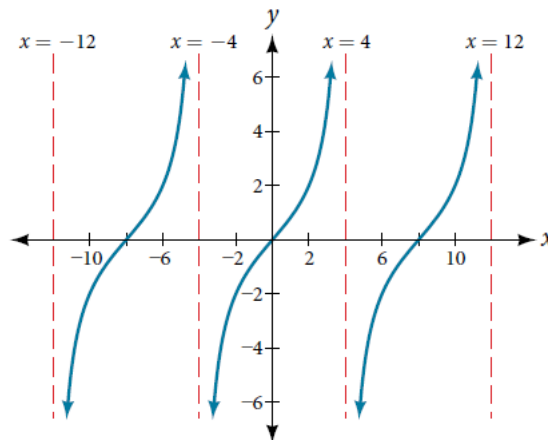
1. Determine the amplitude, period, frequency, phase shift, and vertical shift for each of the following functions:

   a.) $-3\cos(\frac{3\pi}{4} + 3\pi x) - 2$;

   b.) $\frac{1}{2}\sin(-\frac{2}{3}x - \pi) + 1$.

2. Write an equation for the following graph:

3. Do each of the following:

   a.) write an equation for a sinusoidal function with amplitude 3, period $\pi/2$, and phase shift $\pi/4$;

   b.) write another equation that represents your function from part (a) shifted horizontally by half of its period. (*This is how noise-canceling headphones work.*)

4. The London Eye is a huge Ferris wheel with a diameter of 135 meters. It completes one rotation every 30 minutes. Riders board from a platform 2 meters above the ground. Express a rider's height above ground as a function of time t in minutes.