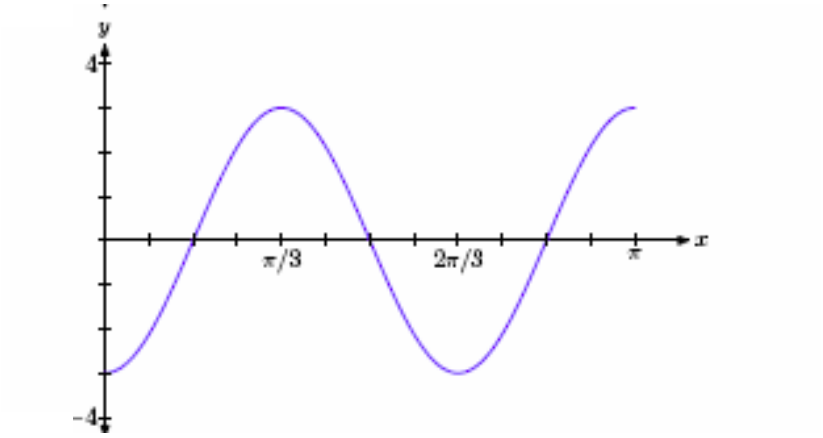
Pre-Calculus

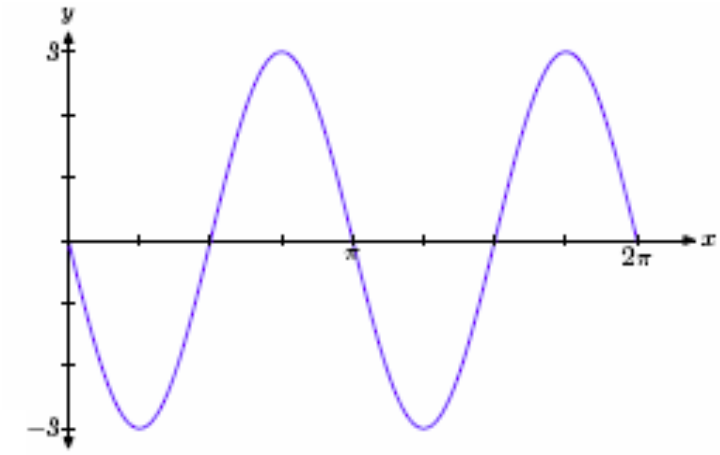
Name _____

Date _____ Period _____

1. Write an equation using **sine** for the following curve.



2. Write an equation using **cosine** for the following curve.



Sine and Cosine Application Problems **Name _____**

Use a separate sheet of paper to solve the following problems. Show all work and label your answers. When using a graphing calculator to answer questions, write down the window that was used along with the equation(s) entered on your calculator.

1. A group of CCHS students decided to study the sinusoidal nature of tides. Values for the depth of the water level were recorded at various times. At t = 2 hours low tide was recorded at a depth of 1.8 meters. At t = 8 hours, high tide was recorded at a depth of 3.6 meters.
   a. Write a function expressing the distance in terms of time.
   b. Sketch the graph and label any key points.
   c. What was the depth of the water at t = 7? t = 10? t = 21? Round to 3 decimal places.
   d. What are the first two times when the depth of the water is 2.5 meters? Round to 3 decimal places.

2. One complete push-up takes 3 seconds. The student starts the push-up at 20 inches above the ground and finishes the push-up at 3 inches above the ground.
   a. Write a function expressing the distance in terms of time.
   b. Sketch the graph and label any key points.
   c. After how many *seconds* is the student 15.5 inches above the ground? Round to 3 decimal places.
   d. How far above the ground is he after 5.75 seconds? Round to 3 decimal places.

3. A Ferris wheel is 50 feet in diameter with the center 60 feet above the ground. You enter a platform that is at the 3 o'clock position. It takes 80 seconds to complete one revolution.
   a. Find the equation that gives you your height when you entered the Ferris wheel above the ground at time t. (when t = 0)
   b. Sketch the graph and label any key points.
   c. After how many seconds were you 75 feet above the ground? Round to 3 decimal places.