Trigonometric Graphing Review

1. $y = 2\sin 4(x + \pi)$

2. $y = 2\sin\dfrac{\pi}{2}(x-1) + 2$

3. $y = -\cos 2\left(x + \dfrac{\pi}{4}\right)$

4. $y = 2\cos\pi(x-2) - 3$

Write the equation of a sine function that has the given characteristics.

5. Amplitude: 3

   Period: π

6. Amplitude: 4

   Period: $\dfrac{\pi}{6}$

7. Amp: 2

   Period $\dfrac{3\pi}{4}$

8. Amp: 5
   Period: 4π

   Phase Shift π right

9. Amp 6
   Period 4

   Phase Shift 3 left

   Vertical Shift Down 4

10. Amp 1.5
   Period 8π

    P.S $\dfrac{5\pi}{4}$ right

    V.S up 2
    Reflect over x-axis

The center of a Ferris wheel is 8 meters above the ground. The Ferris wheel itself has a diameter of 12 meters. The wheel turns counterclockwise at a constant rate and takes 60 seconds to make one complete revolution.

a. Suppose Jim and his friends enter a seat directly at the 3 o'clock position. Sketch a graph that you would expect to show their height above the ground during a two-minute ride. Label the x-axis of your sketch using seconds. Label the y-axis using meters.
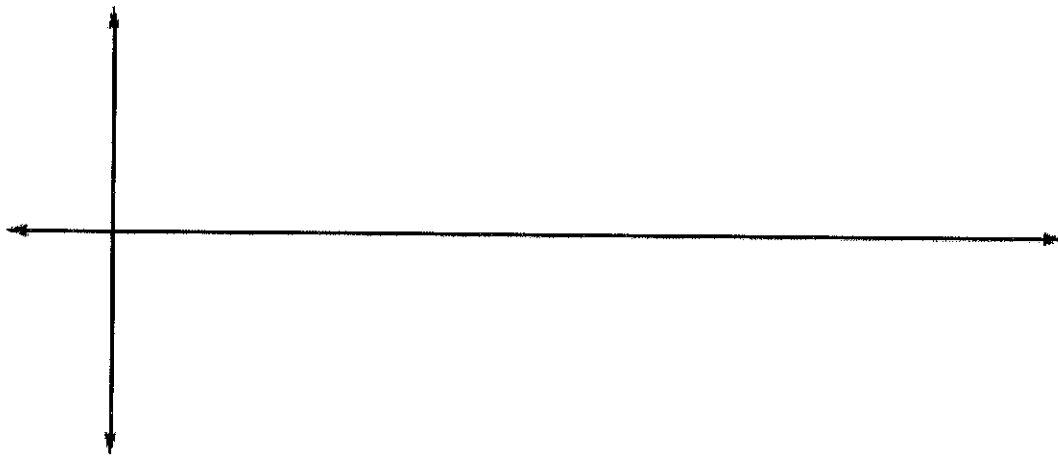
b. What is the maximum height of the Ferris wheel? Minimum height?

c. Write the equation to model path of the Ferris wheel.

Temperature Data: The normal monthly Fahrenheit temperatures in Helena, MT, are shown in the table below (month 1 = January)

Model the temperature T as a sinusoidal function of time using 20 as the minimum value and 68 as the maximum value. Support your answer graphically by graphing your function with a scatter plot.

M	1	2	3	4	5	6	7	8	9	10	11	12
T	20	26	35	44	53	61	68	67	56	45	31	21

The center of a Ferris wheel in an amusement park is 7 meters above the ground and the Ferris wheel itself is 12 meters in diameter. The wheel turns counterclockwise at a constant rate and takes 20 seconds to make one complete revolution.

Yolanda and her friends enter their seat when it is directly below the wheel's center. Write an equation to model the height of the Ferris wheel at different times of the ride.

On a particular day, the depth of eater in feet at the entrance to a harbor is modeled by the function $d(t) = 8 + 4 \sin 0.5t$, where t is hours after 6 A.M.

a. What are the minimum and maximum depths on this day? What times do they happen?

Maximum Depth _____   Time it occurs _____

Minimum Depth _____   Time it occurs _____

b. Edgar has a boat that needs at least 6 feet of water. During what times after 6 A.M. and before 7 P.M. will the water at the entrance to the harbor be less than 6 feet deep? Write and solve an equation to help you answer the question.

Calculating the Ebb and Flow of Tides for Maui

February 12th, 2016, high tide occurred at 7:02 pm. At that time the water was 1.5 meters deep. Low tide occurred at 12:36 p.m, at which time the water was only .2 meters deep. Assume that the depth of the water is a sinusoidal function of time with a period of half a lunar day (about 12 hrs 24 min)

a) Model the depth, D, as a sinusoidal function of time, t, algebraically then graph the function.

b) At what time did the first low tide occur?

c) What was the approximate depth of the water at 6:00 am and at 3:00 pm?

d) What was the first time on this day when the water was 1 meter deep?