As you ride a Ferris wheel, your distance from the ground varies sinusoidally with time. When the last seat is filled and the Ferris wheel is started, your seat is at the position shown below in the figure. Let x be the number of seconds that have elapsed since the Ferris wheel started. You find that it takes 3 seconds to reach the top, 43 ft above the ground. It takes 8 seconds to make a full revolution. The diameter of the wheel is 40 feet.

( , )

( , )

( , )

( , )

X = 0

( , )

( , )

a. What are two maximum points? Fill in the box at the top of the Ferris wheel.

b. If the diameter of the Ferris wheel is 40 feet, and the maximum height is 43 feet, how far above the ground is the Ferris wheel suspended?

c. What are two minimum points? Fill in the box at the bottom of the Ferris wheel.

d. What are two midpoints? Fill in the boxes at the sides of the Ferris wheel.

e. Graph your points below. f. Write the function.

 Sine or Cosine?

 Vertical Shift \_\_\_\_\_\_\_\_\_\_ Amplitude \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Phase Shift \_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b = $\frac{2π}{period}$ \_\_\_\_\_\_\_\_\_\_\_\_\_

 Function \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. A tsunami (commonly referred to as a tidal wave) is a fast-moving wave caused by an underwater earthquake. The water first goes down from its normal level, then rises an equal distance above its normal level, and finally returns to its normal level. The period is approximately 15 minutes. Suppose a tsunami reached a maximum height of 19 feet above sea level, and minimum height 1 foot below sea level in Honolulu.

a. Given the maximum and minimum, what is the normal height of a wave in Honolulu

b. Graph the height of the wave over one period below. c. Write the function.

 Sine or Cosine

 Vertical Shift \_\_\_\_\_\_\_\_\_\_ Amplitude \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Phase Shift \_\_\_\_\_\_\_\_\_\_\_ Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b = $\frac{2π}{period}$ \_\_\_\_\_\_\_\_\_\_\_\_\_

 Function \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

c. Predict the depth of the water at the following times.

 2 minutes \_\_\_\_\_\_\_\_\_\_\_\_\_ 4 minutes \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 12 minutes \_\_\_\_\_\_\_\_\_\_\_\_\_\_