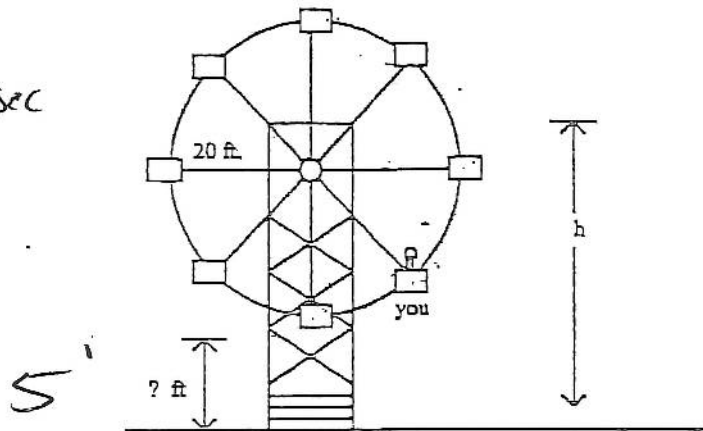


FERRIS WHEEL PROBLEM

At the local carnival you decide to ride the Ferris wheel and determine it would make a great problem for math class, since you realize that your distance from the ground is a function of your travel time. The Ferris wheel, as shown below, has a diameter of 40 feet and makes one revolution every 8 seconds. You are the next to the last person to get on, so when the last seat is filled and the Ferris wheel starts, you are seated as shown. You notice it takes four seconds for a seat to travel from the bottom of the Ferris wheel to the top, which is 45 feet above the ground. Let t be the number of seconds that have elapsed since the Ferris wheel started and let d be the distance that YOUR seat is above the ground.

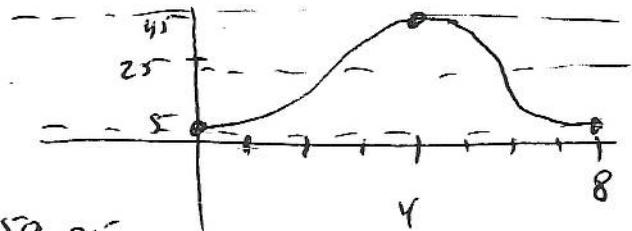
Period = 8 sec



1. Sketch a graph of the function $(t, d(t))$. What type of function is it? sinusoidal

$$B = \frac{2\pi}{8 \text{ (period)}} = \frac{\pi}{4}$$

$$C = 0$$



$$\Rightarrow A = \frac{45 - 5}{2} = \frac{40}{2} = 20$$

$$D = \frac{45 + 5}{2} = \frac{50}{2} = 25$$

2. What is the lowest point you reach as the Ferris wheel turns? 5 feet

3. Write a sinusoidal equation that models your data.

$$d(t) = -20 \cos \frac{\pi}{4}(t+1) + 25$$



(you don't start @ 0)

4. Use your model to predict the height of your seat above the ground after:

a. 0 seconds 10.858

b. 4 seconds 39.142

c. 9 seconds 25

5. How long does it take you to reach a height of 20 feet the first time? .68 sec

The second time? 5.72 sec