Name:

**Ferris Wheel and Cart**

Remember the Ferris Wheel we have worked with in the beginning of the unit.

* Radius is 50ft
* Center is 65ft above the ground
* Period of the Ferris Wheel is 40 seconds
* Ferris Wheel starts at the 3 o’ clock position

**Part 1:** Jumping from Ferris Wheel to cart of water

It is now time to consider the cart of water where our most beloved senior will land. Note that the cart full of water is 8ft above the ground.

1. Consider the diver jumping off the at the 11 o’ clock position:
   1. How high is the diver from the cart of water?
   2. How many seconds did it take to reach the 11 o’clock position?
2. Recall the formula for a falling object with no initial velocity.
   1. From the 11 o’ clock position, how long will it take the diver to reach the tub of water?
3. Generalize a formula for the **time falling to cart** () at any point on the ferris wheel. (note I want the formula for the amount of time it takes falling from the ferris wheel to the cart of water)

**Part 2**: That cart be moving

The cart is going to start 240ft to the left of the Ferris Wheel, and travels 15ft per second. At t=0 the ferris wheel is at the 3 o’ clock position.

1. What is the formula for finding the horizontal position for where the diver will land?
2. Where will the most beloved senior land if released at the following times:
   1. t=3
   2. t=26
   3. t=37
3. What is the formula that describes the carts position given time t?
4. Given the information about the cart, use desmos to find what time is the cart directly below the diver on the ferris wheel?
5. Will our beloved senior survive if she jumped off when the cart was directly below her position?
6. Generalize a formula for the position of the cart that accounts for the diver falling. (tell Ande to write terms on the board to make this easier)