

5. (11 points) A child is sitting on a Ferris wheel. If the origin is at the center of the circle and we measure x and y in meters, her motion is given by the following parametric equations:

$$x = 125 \sin((2\pi/9)t), \quad y = -125 \cos((2\pi/9)t),$$

where we measure t in minutes since she boarded the ride.

- (a) (2 pts.) What is the diameter of the Ferris wheel?
- (b) (2 pts.) How long does it take for the Ferris wheel to make one complete revolution?
- (c) (3 pts.) Find the speed of the child 10 minutes into the ride.
- (d) (4 pts.) If at 10 minutes into the ride the child were to suddenly step off of the Ferris wheel, her motion would initially be along the tangent line at $t = 10$. Determine parametric equations for this tangent line.