3. [**16 points**] Tom is riding a ferris wheel. The radius of the wheel is 48 m and the center of the wheel is 50 m from the ground. The ride lasts 10 minutes and consists of 3 complete revolutions. The wheel rotates counterclockwise. It takes Tom 2 minutes to reach the top of the wheel from the position where he boards the wheel.

   (a) Find Tom's angular velocity.

   (b) Find Tom's coordinates at time t, with respect to a coordinate system having the origin on the ground, directly below the center of the wheel.

   (c) Find the coordinates of P, Tom's position at time t=3 min.

   (d) 3 minutes into his ride Tom drops his camera. The camera's path to the ground is the line tangent to the wheel at P (Tom's position at time t=3 min). Where does the camera hit the ground ? (Your answer should be of the form x meters left/right of the center of the wheel).