Physics
Quiz # 5

Date Given: May 12, 2022
Date Due: May 19, 2022

Q1. (1 point) In the case of uniform circular motion the magnitude of the acceleration is constant.

(a) True

(b) False

Q2. (1 point) In the case of uniform circular motion the velocity and acceleration vectors are

(a) parallel

(b) perpendicular

(c) neither from the above

Q3. (2 points) Find an equation in polar coordinates that has the same graph as the given equation in rectangular coordinates.

(a) $(x^2 + y^2 - 2ax)^2 = 4a^2(x^2 + y^2)$

(b) $\sqrt{(x^2 + y^2)^3} = 2axy$

Q4. (2 points) The car has a speed of 10m/s. Determine the angular velocity $\dot{\theta}$ of the radial line OA at this instant.

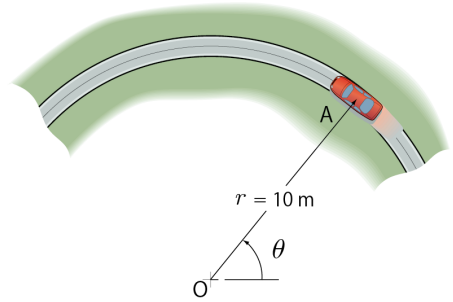

Figure 1: Illustration to Q4.

Q5. (2 points) A particle is moving along a circular path having a radius of 1m such that its position as a function of time is given by $\theta = \cos 2t$, where θ is in radians and t is in seconds. Determine the magnitude of the acceleration of the particle when $\theta = \frac{1}{2}$rad.