

SHOW ALL WORK!!! Unsupported answers might not receive full credit.

Problem 1 [6 pts] Suppose $\vec{r}(t) = \langle 3t, 2 \sin 2t, 2 \cos 2t \rangle$, $0 \leq t \leq 2\pi$.

a) [1 pt] Find $\vec{r}'(t)$ and $|\vec{r}'(t)|$ for this curve.

b) [2 pts] Find the length of the curve.

c) [3 pts] Is the curve parameterized by arclength? If it is not, find another description of the curve that uses arclength as a parameter.

Quiz 10 - Take Home

Recitation Instructor: _____

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Problem 1 [3 pts] A golfer stands 5 m above the fairway and drives a golf ball with an initial velocity of $v_0 = \langle 0, 20, 49 \rangle m/s$. The golfer wishes to impart slice to the golf ball, which is modeled by an acceleration of $1.2m/s^2$ in the \hat{x} direction. Thus, the acceleration function is given by:

$$\vec{a}(t) = \langle 1.2, 0, -9.8 \rangle .$$

Assuming $\vec{r}(0) = \langle 0, 0, 5 \rangle$, determine:

- a) [2 pts] The velocity and position functions.
- b) [1 pt] The maximum height of the golf ball.
- c) [1 pt] The range of the shot; that is, the distance between where the ball lands and $\langle 0, 0, 0 \rangle$.