

Math 233 - Quiz 5

February 23, 2023

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) Let $\vec{r}(t) = 2t\hat{i} + (t+3)\hat{j} + 6t\hat{k}$. Reparameterize $\vec{r}(t)$ in terms of the arc-length parameter.
2. (3 points) Consider the curve described by $\vec{r}(t) = e^t\hat{i} + 2t\hat{j} - 7\hat{k}$. Compute the curvature at the point where $t = 0$.
3. (3 points) Let $\vec{r}(t) = \sin(2t)\hat{i} + t\hat{j} + \cos(2t)\hat{k}$. Compute $\hat{N}(t)$.
4. (1 point) Refer to problem 1. Explain why $\hat{N}(t)$ does not exist for $\vec{r}(t)$.