Math 143 Quiz 5

Names: _____

1. Show that the curvature of the graph of $y = f(t)$ is given by $\kappa(t) = \dfrac{|f''(t)|}{(1 + f'(t)^2)^{3/2}}$.

2. Suppose $\mathbf{r}$ is parameterized by arclength, meaning that $\kappa = |\mathbf{r}''|$. Show that if $\kappa = 0$, then $\mathbf{r}$ is a line.

3. Parameterize the line that passes through the point (a, b, c) and is parallel to the vector $\mathbf{v}$ by arclength.

4. Show that $\mathbf{B}' \cdot \mathbf{B}$ and $\mathbf{B}' \cdot \mathbf{T}$ are both 0. Why does this show that $\mathbf{B}'$ and $\mathbf{N}$ are parallel?