

Name:

Section (circle one):      10-11      11-12

1. Find the unit tangent vector  $\mathbf{T}(t)$  to the curve  $\mathbf{r}(t) = (\sin t)\mathbf{i} + 4\mathbf{j} - (\tan t)\mathbf{k}$  at  $t = \frac{\pi}{4}$ .

2. Find the limit, if it exists, or show that the limit does not exist:

$$\lim_{(x,y,z) \rightarrow (0,0,0)} \frac{xy + yz + zx}{x^2 + y^2 + z^2}$$