Quiz 2 (front and back) Name: _____

1. Let $\mathbf{a} = \mathbf{i} - \mathbf{j} - \mathbf{k}$ and $\mathbf{b} = 2\mathbf{i} - \mathbf{j} + 4\mathbf{k}$.

   (a) Find the cross product $\mathbf{a} \times \mathbf{b}$.

   (b) Find the equation of the line parallel to $\mathbf{a} \times \mathbf{b}$ and through the point $(-1, 4, 3)$.

2. Let $\mathbf{r}(t) = \langle e^{\sin t}, \cos(\cos t), 1 - t^{-1} \rangle$. Find each of the following:

Note: These quantities may or may not exist. If something doesn't exist, state that and then clearly explain why.

(a) The domain of $\mathbf{r}$.

(b) $\lim\limits_{t \to 0} \mathbf{r}(t)$.

(c) The unit tangent vector at $t = \pi$.