**Department of Mathematics and Statistics**

# Quiz No. 3

Math302,Sem121

Section: Name: ID:

**Problem 1.**(3 points.)Express the vector function $\hat{r}(t) = 2cost\hat{i} + 2sint\hat{j} + t\hat{k}$ in terms of the arc length parameter 's'.Show that tangent vector "$dr/ds$" to the re-parameterized vector function $\hat{r}(s)$ is a unit tangent vector.

**Problem 2**(3 points)Find the directional derivative of the $f(x, y, z) = xy+xz+xyz$ at (1,1,2) in the direction of $3\hat{i} + 2\hat{j} + 3\hat{k}$.

**Problem 3**(2 points) Given the function $f(x, y) = e^x cosy$. Find a vector that gives the direction in which the given function decreases most rapidly.