Name:

1. Evaluate the integral of the vector field $\vec{F}(x, y, z) = \langle yz, xz, xy \rangle$ along the curve $\mathbf{r}(t) = (3t, t^2, t^3)$, for $t \in [0, 1]$.

2. Determine if the vector field $\vec{F}(x, y) = e^y \mathbf{i} + xe^y \mathbf{j}$ is conservative. If it is, find a function $f(x, y)$ such that $\vec{F} = \nabla f$.