Instructions: Show all work. Use exact answers unless otherwise asked to round.

1. Use the Fundamental Theorem of Line Integrals to evaluate $\int_C \vec{F} \cdot d\vec{r}$ for the vector field $\vec{F}(x,y,z) = yze^{xz}\hat{\imath} + e^{xz}\hat{\jmath} + xye^{xz}\hat{k}$ on the curve $C: \vec{r}(t) = (t^2 + 1)\hat{\imath} + (t^2 - 1)\hat{\jmath} + (t^2 - 2)\hat{k}$, $0 \leq t \leq 2$.

2. Use Green's Theorem to evaluate $\int_C xy^2 dx + 2x^2 y dy$ where C is the boundary of the region $y = x^2, y = x$.