MTH 265, Quiz #15, Fall 2018 Name _____

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

1. Find the surface area of the function $z = xy$ over the region bounded inside the cylinder $x^2 + y^2 = 2$.

2. Set up the integral needed to find the surface area of the function $\vec{r}(u, v) = u^2 \cos v\, \hat{\imath} + u^2 \sin v\, \hat{\jmath} + uv\hat{k}$ over the region $0 \leq u \leq 3, 0 \leq v \leq 2\pi$. You do not need to integrate.

3. 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: $\vec{r}(t) = (t^2 + 1)\hat{\imath} + (t^2 - 1)\hat{\jmath} + (t^2 - 2)\hat{k}$, $0 \leq t \leq 2$.

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