

Show all work. 5 points each.

1. Set up the integral $\iint_S \mathbf{F} \cdot d\mathbf{S}$ where $\mathbf{F}(x, y, z) = \langle xze^y, -xze^y, z \rangle$ and S is the part of the plane $x + y + z = 1$ in the first octant with upward orientation.

2. Use Stokes Theorem to evaluate $\int_C \mathbf{F} \cdot d\mathbf{r}$ where C is the triangle with vertices $(1, 0, 0)$, $(0, 1, 0)$, and $(0, 0, 1)$ oriented counterclockwise and $\mathbf{F}(x, y, z) = \langle x + y^2, y + z^2, z + x^2 \rangle$.