

Show all work. 5 points each.

1. Use Stokes Theorem to SET UP the integral $\iint_S \text{curl}(\mathbf{F}) \cdot d\mathbf{S}$ where S is the upper half of the sphere $x^2 + y^2 + z^2 = 4$ oriented upward and $\mathbf{F} = \langle x^2 e^{yz}, y^2 e^{xz}, z^2 e^{xy} \rangle$.

2. Use the divergence theorem to SET UP the integral $\iiint_S \mathbf{F} \cdot d\mathbf{S}$ as a triple integral where $\mathbf{F} = \langle xy, yz, zx \rangle$ and S is the solid cylinder $x^2 + y^2 \leq 1, 0 \leq z \leq 1$.