

Show all work. 5 points each.

1. Use Stokes Theorem to evaluate $\oint_C \mathbf{F} \cdot d\mathbf{r}$ where $\mathbf{F} = \langle yz, 2xz, e^{xy} \rangle$ and C is the circle $x^2 + y^2 = 16$, $z = 5$. Hint: The surface S is the disk $x^2 + y^2 \leq 16$, $z = 5$.

2. Use the Divergence Theorem to set up the $\iiint_S \mathbf{F} \cdot d\mathbf{S}$ as a triple integral, where $\mathbf{F} = \langle xye^z, xy^2z^3, -ye^z \rangle$ and S is the surface of the box bounded by the coordinate planes and the planes $x = 3$, $y = 2$ and $z = 1$.