

Name:

Section (circle one): 10-11 11-12

1. Let $\mathbf{F}(x, y, z) = \langle 4yz, -xz^2, \sin(xyz) \rangle$. Compute the flux of $\text{curl } \mathbf{F}$ across the the part of the paraboloid $z = x^2 + y^2$ lying below the plane $z = 4$, oriented upward. [Hint: Stokes' Theorem.]

2. Find the flux of the vector field $\mathbf{F}(x, y, z) = \langle e^{\cos x}, \sin(xy), z(\sin x)e^{\cos x} - xz \cos(xy) \rangle$ through the surface $x^2 + y^2 + z^2 = 9$, oriented outward. [Hint: Divergence Theorem.]