Section 16.8: Additional Problems

1. Let $\mathbf{F} = \langle xz,\ 2xy,\ 3xy \rangle$. Evaluate $\int_C \mathbf{F} \cdot d\mathbf{r}$ where C is the boundary of the part of the plane $3x + y + z = 3$ in the first octant and C is oriented counterclockwise as viewed from above.

2. Use Stokes's Theorem to evaluate $\iint_S$ curl $\mathbf{F} \cdot d\mathbf{S}$

   $\mathbf{F} = \langle yz^3,\ \sin(xyz),\ x \rangle$

   S is the part of the paraboloid $y = 1 - x^2 - z^2$ that lies to the right of the $xz-$plane, oriented toward the $xz-$plane.

3. Use Stokes's Theorem to evaluate $\iint_S$ curl $\mathbf{F} \cdot d\mathbf{S}$

   $\mathbf{F} = \langle xyz,\ xy,\ x^2yz \rangle$

   S consists of the top and the four sides (but not the bottom) of the cube with vertices $(\pm 1,\ \pm 1,\ \pm 1)$, oriented outward. Hint: Think about the last example in the lecture.