Quiz 10

1. Choose the correct answer. $\int \int_{\mathcal{S}} \mathbf{F} \cdot d\mathbf{S}$ is zero if (1 pt.)

   (a) $\mathbf{F}$ is tangent to $\mathcal{S}$ at every point.

   (b) $\mathbf{F}$ is perpendicular to $\mathcal{S}$ at every point.

2. Compute $\int \int_{\mathcal{S}} \mathbf{F} \cdot d\mathbf{S}$ for $\mathbf{F} = y^2\mathbf{i} + 2\mathbf{j} - x\mathbf{k}$, where $\mathcal{S}$ is given by the portion of the plane $x + y + z = 0$ in the octant $x, y, z \geq 1$, with upward-pointing normal. (9 pt.)