234 Quiz 12 (15min)

Section: *Name:*

1. Let $\mathcal{S}$ be the surface $xy - z = 2$ for $1 \leq x \leq 2, 1 \leq y \leq 2$. Set up the integral $\iint_{\mathcal{S}} \vec{v} \cdot \vec{N} dA$ for $\vec{v} = (x^2, zy, 1)$ without solving, where $\vec{N}$ is the normal pointing above(I don't say it's vertical).

2. $\vec{v} = (x, yz, xy)$. Let $\mathcal{S}$ be the sphere $x^2 + y^2 + z^2 = 4$. Write out the formula for the outer flux of $\vec{v}$ on $\mathcal{S}$ and change it into a volume integral in spherical coordinates.