Math 20550 Calculus III Tutorial **Name:** _____
April 21, 2016

Tutorial Worksheet

Show all your work.

1. Let S be the surface $y^2+z^2 = 1$, $z \geq 0$ and $0 \leq x \leq 1$. Let S have the upward orientation. Find $\iint_S \mathbf{F} \cdot d\mathbf{S}$ where $\mathbf{F}(x, y, z) = \langle 0, 0, z \rangle$.

2. Compute the surface area of the surface $x^2 + y^2 + z = 4$ above xy-plane.

3. Let the surface be given by $r(u, v) = \langle u \cos v, u \sin v, v \rangle$. Find the tangent plane of this surface at $p = (\sqrt{2}, \sqrt{2}, \pi/4)$.

4. Evaluate $\iint_S \frac{1}{z} dS$ where S is given by $x^2 + y^2 + z^2 = 4, z \geq 1$.