Math 261-001
Quiz 9, November 6

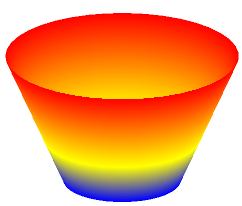
Name	CSU ID #

Be sure to read each question carefully. You must choose and answer **exactly two** of the three problems. If you attempt more than two, only the first two will be graded. Write your final answers in the boxes provided. Each problem is worth the same number of points. **Each problem is accompanied by a figure to help you visualize the region in question.**

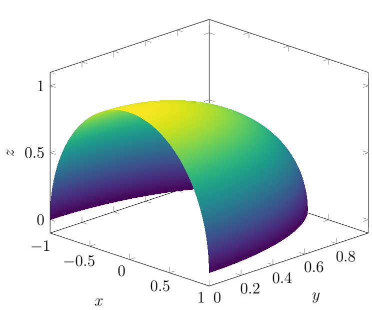
1. Look, it's your dog/cat/pet with one of those cone things so that they don't do something they're not supposed to. You ponder for a moment and realize that the surface can be parametrized as a ruled surface. Assume that the cone's boundary circles can be parametrized as

$$r_1(\theta) = (2\cos(\theta), 2\sin(\theta), 2), \quad \text{and} \quad r_2(\theta) = (4\cos(\theta), 4\sin(\theta), 4),$$

both from $0 \leq \theta < 2\pi$. Using a ruled surface parametrization, parametrize such a portion of the cone. [Using another parametrization will award you with at most half the points]



2. You bought one of those pieces of cheese ball with the red peel. Before throwing away the peel you decide it's time to test yourself and see whether you can parametrize it. Assume the cheese ball has radius 3 and the piece you got is bounded below by the xy plane and on the side by the xz plane. Given this, parametrize the described peel.



3. Recall that integrating a vector field F through a surface can be done by computing $\iint_S F(r) \cdot \vec{n} \mathrm{d}A$ where $\vec{n}$ is the normal vector to the surface S parametrized by r.

   Given the surface $x + y + z = 1$ and the vector field $F = (0, 0, z)$, compute the integral $\iint_S F(r) \cdot \vec{n} \mathrm{d}A$. (Your answer should be a number, not an integral.)