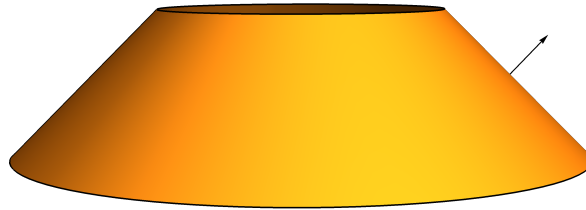# Math 2374 - Quiz 7

Name: _____

Section: _____

Let S be the following piece of an inverted cone

$$z = 1 - \sqrt{x^2 + y^2} \qquad\qquad 0 \leq z \leq \frac{1}{2}.$$

We give S the orientation for which the normal vector $\vec{n}$ points *out* of the cone.

1. This surface has two disconnected boundaries: the top and bottom circles. What is the orientation on these two circles induced by the orientation of S?

Consider the following parametrization of S:

$$\Phi(z, \theta) = \big((1 - z) \cos \theta, (1 - z) \sin \theta, z\big),$$

for $z \in [0, 1/2]$ and $\theta \in [0, 2\pi]$.

2. Compute $T_z \times T_\theta$. Is Φ orientation preserving or reversing? Explain your answer.

3. Integrate the vector field $V = x\vec{i} + y\vec{j}$ over S