

Show all work. 5 points each.

1. Find the volume of the solid that lies within the cylinder  $x^2 + y^2 = 1$  above the  $z = 0$  plane and below the cone  $z^2 = x^2 + y^2$

2. Convert the integral to Spherical Coordinates. Including the limits of integration.  $\iint_E z dV$  where E lies between the spheres  $x^2 + y^2 + z^2 = 1$  and  $x^2 + y^2 + z^2 = 4$  in the first octant.

