## Math 13 Worksheet \#5: Triple integrals and cylindrical coordinates

(1) Use a triple integral to find the volume of a pyramid whose base is the square with vertices $(1,0,0),(0,1,0),(-1,0,0)$, and $(0,-1,0)$ and whose top vertex is $(0,0,1)$.
(2) Find the center of mass of the pyramid assuming the density is uniform inside.
(3) Find the mass of the slice of the right circular cylinder $x^{2}+z^{2}=4$ bounded on the left by the $x z-$ plane and the on right by the plane with equation $x-y+z=-4$ if the density at each point in the cylinder is proportional to the distance of the point to the $x z-$ plane. (You can choose cylindrical or Cartesian coordinates.)
(4) Find the volume of the solid that lies between the paraboloid $z=x^{2}+y^{2}$ and the sphere $x^{2}+y^{2}+z^{2}=4$

