MATH 213- EXAM III -November 19, 2008

1)Find the surface area that is cut from the saddle shaped surface $z = xy$ by the cylinder $x^2 + y^2 = 1$

2)Evaluate, using triple integration, the volume of the region in the first octant bounded by the coordinate planes (x=0,y=0,z=0) the plane $y + z = 2$ and the parabolic cylinder $x = 4 - y^2$

3)Find, using cylindrical coordinates, the mass of the ellipsoidal solid given by $4x^2 + 4y^2 + z^2 = 16$ lying above the x-y plane. The density at a point in the solid is proportional to the distance between the point and the x-y plane ($\rho = kz$)

4)Using spherical coordinates, find the volume enclosed by the cone $z^2 = x^2 + y^2$ and the hemisphere $x^2 + y^2 + z^2 = 9$ $(z \geq 0)$

5) Integrate the line integrals along the space curve described by

$x = t^2$, $y = t$, $z = t^2$ $0 \leq t \leq 1$

a) $\int_c \frac{x+z}{y} ds$

b) $\int_c \mathbf{F} \cdot d\mathbf{r}$