1) a) Find the volume of the solid that is bounded by the elliptic paraboloid $2x^2 + y^2 + z = 9$ and the planes $x = 1$ and $y = 1$ and the three coordinates planes.

b) Evaluate the integral $\iint_D xsiny\, dA$, where is the region bounded by the curves $y = 0,\ y = x^2,\ and\ x = 2.$

2) Evaluate the iterated integrals:

a) $\int_0^1 \int_{3y}^3 e^{x^2} dxdy$ b) $\int_{-5}^5 \int_0^{\sqrt{25-x^2}} \cos(x^2 + y^2)\, dydx.$

3)a) Find the area of the part of the hyperbolic paraboloid $z = y^2 - x^2$ that lies between the cylinders $x^2 + y^2 = 1$ and $x^2 + y^2 = 4$.

b) Evaluate the triple integral $\int_0^2 \int_y^1 \int_0^{xy} 2x dz dx dy$.

4) a) Evaluate the triple integral by changing to cylindrical coordinates:

$\int_{-1}^{1}\int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}}\int_{\sqrt{x^2+y^2}}^{1} xzdzdydx.$

b) Change the point $(3,\frac{\pi}{2},\frac{3\pi}{4})$ from spherical coordinates to rectangular coordinates.

5)a) Write the equation $x^2 + y^2 - 2y + z^2 = 0$ in spherical coordinates and sketch .

b) Find the volume of the part of the ball $\rho \leq 2$ that lies between the cones $ø = \frac{\pi}{6}$ and $ø = \frac{\pi}{3}$.