1. Find the area of the following surface.
   (a) The part of the paraboloid \( z = 9 - x^2 - y^2 \) that lies above the \( x - y \) plane.
   
   (b) The part of the sphere \( x^2 + y^2 + z^2 = 4 \) that lies above the plane \( z = 1 \).

2. Evaluate the following triple integrals:
   (a) \( \int \int \int_E yz \sin(x^5) dV \) where 
       \( E \) is the region \( \{(x, y, z)|0 \leq x \leq 1, 0 \leq y \leq x, x \leq z \leq 2x\} \)
   (b) \( \int \int \int_E zdV \) where \( E \) is the region bounded by \( x = 0, y = 0, z = 0 \) and \( 2x + y + 2z = 4 \).
3. A bead is made by drilling a cylindrical hole of radius 1 mm through a sphere of radius 9 mm. Set up a triple integral in cylindrical coordinates representing the volume of the bead. Evaluate the integral. (Hint: Express the region \( E = \{(x, y, z)|x^2 + y^2 + z^2 \leq 9 \text{ and } x^2 + y^2 \leq 1\} \) in cylindrical coordinates and find \( \int \int \int_E dV \).)

4. (a) A spherical cloud of gas of radius 3 km is more dense at the center than toward the edge. At a distance of \( \rho \) km from the center, the density is \( \delta(\rho) = 3 - \rho \). Write an integral representing the total mass of the cloud of gas and evaluate it.

(b) A half-melon is approximated by the region between two concentric spheres, one a radius 1 and the other of radius 2. Write a triple integral, including limits of integration, giving the volume of the half-melon. Evaluate the integral.