Calculus III, Worksheet #10

1. Evaluate

$$\iiint (xy + z^2)dV$$

   over the region $D = \{ (x,y,z) \,|\, 0 \le x \le 2, 0 \le y \le 1, 0 \le z \le 3\}$.

2. Evaluate

$$\iiint_E e^{\frac{z}{y}}dV$$

   where $E = \{ (x,y,z) \,|\, 0 \le y \le 1, y \le x \le 1, 0 \le z \le xy\}$.

3. Evaluate

$$\iiint_T x^2 dV$$

   where T is the solid tetrahedron with vertices $(0,0,0), (1,0,0), (0,1,0)$ and $(0,0,1)$.

4. Find the volume of the solid enclosed by the parabolas $y = x^2 + z^2$ and the plane $y = 8 - x^2 - z^2$.

5. Write five other iterated integral that are equal to the following iterated integral:

   a. $\int_0^1 \int_y^1 \int_0^y f(x,y,z)dzdxdy$

   b. $\int_0^1 \int_y^1 \int_0^z f(x,y,z)dydxdz$.