Math 263 Assignment 6

Due October 24

■ **Problems from the text (do NOT turn in these problems):**

- Section 16.4 : 1-34.
- Section 16.5 : 3-20, 28, 30, 32.
- Section 16.6 : 3-22, 27-44, 49, 50.

■ **Problems to turn in:**

1) Find the volume of the solid bounded by the surfaces $z = 3x^2 + 3y^2$ and $z = 4 - x^2 - y^2$.

2) Sketch the region enclosed by the curve $r = b + a\cos\theta$ and compute its area. Here a and b are positive constants, $b > a$.

3) A lamina occupies the region inside the circle $x^2+y^2 = 2y$ but outside the circle $x^2+y^2 = 1$. Find the center of mass if the density at any point is inversely poportional to its distance from the origin.

4) Evaluate the triple integral

$$\iiint_E z dV,$$

where E is bounded by the cylinder $y^2 + z^2 = 9$ and the planes $x = 0$, $y = 3x$ and $z = 0$ in the first octant.

5) Find the volume of the solid bounded by the cylinder $y = x^2$ and the planes $z = 0$, $z = 4$ and $y = 9$.

6) Sketch the solid whose volume is given by the iterated integral

$$\int_0^2 \int_0^{2-y} \int_0^{4-y^2} dx\, dz\, dy.$$

7) Rewrite the integral

$$\int_0^1 \int_0^{1-x^2} \int_0^{1-x} f(x, y, z)\, dy\, dz\, dx$$

as an equivalent iterated integral in five other orders.