Math 103.01 Summer 2001
Assignment #4
Due: Thursday, June 14, 2001

You must work through all problems on your own. You may consult any reference materials but do not discuss these problems with anyone else in the class. Show all work neatly and in order, and clearly indicate your final answers. Answers must be justified whenever possible in order to earn full credit.

1. Suppose that $f(x, y)$ is continuous. For each of the following integrals, sketch the region of integration and then reverse the order of integration.

a.
$$\int_{-1}^{3} \int_{x^2}^{2x+3} f(x, y) dy \, dx$$

b.
$$\int_{0}^{1} \int_{y}^{1} f(x, y) dx \, dy$$

c.
$$\int_{-2}^{2} \int_{y^2-4}^{4-y^2} f(x, y) dx \, dy$$

d.
$$\int_{0}^{1} \int_{x^4}^{x} f(x, y) dy \, dx$$

2. Evaluate
$$\int_{0}^{1} \int_{y}^{1} \frac{\sin x}{x} dx \, dy.$$

3. Evaluate
$$\int_{0}^{8} \int_{x^{2/3}}^{4} x \cos(y^4) dy \, dx.$$

4. Evaluate
$$\int \int_{R} 12xy \, dA$$
where R is the region in the first quadrant bounded by the curves $x = 1$ and $x = y^2$.

5. Evaluate
$$\int \int_{R} (2x - y) \, dA$$
where R is the region bounded by the lines $y + x = 0$, $y + x = 1$, $y - x = 0$, and $y - x = 1$.

6. Evaluate

$$\int\int\int_E z \, dV$$

where E is the solid region bounded by the planes $2x + 6y + z = 6$, $x = 0$, $y = 0$, and $z = 0$.

7. Setup, but do not evaluate, a double integral representing the volume bounded by the cylinder $x^2 + y^2 = 1$, the paraboloid $z = x^2 + y^2$, and the $xy-$plane.

8. Edwards and Penney: Page 904 #35

9. Edwards and Penney: Page 911 #18

10. Edwards and Penney: Page 911 #34