Course 2E1 2005-06 (SF Engineers & MSISS & MEMS)

Sheet 10

Due: in the tutorial sessions next Wednesday/Thursday

Exercise 1

Sketch the region of integration and evaluate the integral:

(i)

$$\int_{-1}^{1} \int_{0}^{1} y \, dx \, dy$$

(ii)

$$\int_0^1 \int_y^1 (\sqrt{x} - y) \, dx \, dy$$

Exercise 2

Find the volume of the pyramid with vertices (0, 0, 0), (0, 1, 0), (2, 0, 0), (0, 0, 3).

Exercise 3

Find area and center of mass (assuming constant density $\delta = 1$) of the bounded region R:

- (i) R is given by $-1 \le x \le 3, 1 \le y \le 3$;
- (ii) R is given by $x \ge 0, y \ge 0, 3x + 2y \le 6;$
- (iii) R is given by $x \ge 0, y \ge 0, y \le 1 \sqrt{x}$.