PC10372, Mathematics 2
Workshop Sheet 7

1) Evaluate the following double integrals:

$$i) \quad \int_1^2 dy \int_1^2 \frac{1}{y} \, dx$$

$$ii) \quad \int_0^{1/2} dy \int_0^{\pi/2} y \sin(xy) \, dx$$

$$iii) \quad \int_0^{\pi/8} d\theta \int_0^2 t^2 \tan 2\theta \, dt$$

2) Find the volume between the surface $z = 1/(x+y)$ and the plane $z = 0$ over the region $1 < x < 2$ and $0 < y < 1$.

3) Evaluate each of the following integrals. In each case sketch the region of integration and indicate a typical strip for the inner integral.

$$i) \quad \int_0^1 dx \int_0^x x^2 y \, dy$$

$$ii) \quad \int_0^1 dx \int_0^{\sqrt{1-x^2}} x \, dy$$

4) Evaluate each of the following integrals and check your result by reversing the order of integration. As usual, be sure to sketch the region of integration before attempting the integral.

$$i) \quad \int_0^1 dy \int_0^y (x + y) \, dx$$

$$ii) \quad \int_1^2 dy \int_0^{2y-2} x^2 \, dx$$