Course 2E1 2004-05 (SF Engineers & MSISS & MEMS)

Sheet 3

Due: in the tutorial sessions next Wednesday/Thursday

Exercise 1

Calculate first order partial derivatives $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$:

(i) f(x, y) = 12x - 2y, (ii) $f(x, y) = x^2 + y^2$, (iii) $f(x, y) = e^{x+y}$, (iv) f(x, y) = x/y.

Exercise 2

Find the partial derivative $\frac{\partial f}{\partial x}$ for a function z = f(x, y) defined implicitly by the equation:

(i) $z + z^3 = x - y$, (ii) $xyz = e^z$.

Exercise 3

Calculate higher order partial derivatives f_{xy} and f_{xxx} of the following functions:

(i) $f(x,y) = (xy)^2 + \frac{\sin x}{e^x}$, (ii) $f(x,y) = \cos x + y \sin x$.