Exercise Sheet 10

Hand in your work by 11 December.

1. (Warm-up question*) Consider the function f of two variables given by $f(x, y) = x^5 e^y$. Without using a calculator, give an approximate value for $f(1.01, 0.02)$.

2. Find all the (first order) partial derivatives of the functions of two or three variables given by the following formulas.

   (a) $f(x, y) = x^3 y^6$

   (b) $f(x, y) = \dfrac{x}{y}$

   (c) $f(x, y, z) = ze^{xy} + \cos(x - z)$

3. Suppose that the quantity z is a function of t, x, and y, given by $z = tx^y$, while both x and y are functions of t given by $x = t^2$ and $y = 1/t$. Find the total derivative dz/dt.

4. Find all second order partial derivatives of the function

$$f(x, y, z) = x^2 \cos(yz).$$

Solutions will be available after the hand-in date at:
`http://people.bath.ac.uk/rm257/MA10192/`

RM, 28/11/2017

*Do not hand in your work for this question.