Assignment 7 (Due on the week November 2 − 7)

1. The supply function of a certain commodity is: $Q = a + bP^2 + R^{1/2}$ $(a < 0, b > 0)$, (here R is rainfall).

   (a) Find the price elasticity of supply and rainfall elasticity of supply.

   (b) How do the two partial elasticities vary with P and R? In monotonic fashion (assuming positive P and R)?

2. Find all partial derivatives of the first and second order of the composite function $w = f(x, y, z)$, where $x = u + v^2$, $y = u - v$, $z = \ln u + \ln v$.

   For each of the following functions find the critical points.

3. $z = x^2 y^3 (6 - x - y)$.

4. $u = x + \frac{y^2}{4x} + \frac{z^2}{y} + \frac{2}{z}$, $(x > 0, y > 0, z > 0)$.

5. Find the critical points (if any) of the implicit function z of variables x and y defined by
$x^2 + y^2 + z^2 - xz - yz + 2x + 2y + 2z - 2 = 0$.