
MA110 - Engineering Mathematics-1
Problem Sheet - 7

Lagrange Multipliers

1. Find three real numbers whose sum is 9 and the sum of whose squares is as small as possible.
2. Suppose a box with no top is to hold a certain volume V . Find the dimensions for the box that results in the minimum surface area.
3. Determine the maxima and minima of $f(x, y, z) = x^2 - y^2$ on the surface $x^2 + 2y^2 + 3z^2 = 1$.
4. Find the isosceles triangle of maximum area with fixed perimeter length C .
5. Use the method of Lagrange Multipliers to find the maximum and minimum values of the function $f(x, y) = 3x + 4y$ on the circle $x^2 + y^2 = 1$.
