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1. Introduction

Definition of the problem

The problem is to find the maximum value of the function $f(x, y, z)$ subject to the constraints $g(x, y, z) = 0$ and $h(x, y, z) = 0$.

Formulation of the Lagrangian function

The Lagrangian function is defined as $L(x, y, z, \lambda, \mu) = f(x, y, z) - \lambda g(x, y, z) - \mu h(x, y, z)$.

2. Stationary points

First-order conditions

The first-order conditions are given by the system of equations $\nabla L(x, y, z, \lambda, \mu) = 0$, which can be written as $\frac{\partial L}{\partial x} = 0$, $\frac{\partial L}{\partial y} = 0$, $\frac{\partial L}{\partial z} = 0$, $\frac{\partial L}{\partial \lambda} = 0$, and $\frac{\partial L}{\partial \mu} = 0$.

Second-order conditions

The second-order conditions are given by the Hessian matrix $H(x, y, z, \lambda, \mu)$ being negative definite.

3. Conclusion

The maximum value of the function $f(x, y, z)$ is found at the stationary point (x^*, y^*, z^*) .