

Example 34. A company produces two products at a total cost $C(x, y) = 18x^2 + 9y^2$, where x and y represent the units produced of each product. Find the number of units of each product that will minimize cost if there must be a total of 54 units. (Use the method of Lagrange multipliers)

Example 35. A producer desires to minimize his cost of production $C = 2L + 5K$, where L and K are inputs, subject to the production function $Q = LK$. Using Lagrange Multiplier Method, find the optimum combination of inputs if total output is 40 units.

[Delhi Univ. B.Com. (H) 2010]

Example 38. The demand function and the total cost function of a monopolist are as follows:

$$p = 100 - 3q + 4A^{1/2} \quad \text{and} \quad C = 4q^2 + 10q + A,$$

where A is the level of advertisement expenditure. Find the values of A , p and q to maximize profit.

[Delhi Univ. B.Com. (H) 2005, 2008]

Example 39. A manufacturer is planning to sell a new product at a price of ₹ 350 per unit and estimates that if x thousand rupees is spent on development and y thousand rupees is spent on advertisement, consumer will buy approximately $\left[\frac{250y}{y+2} + \frac{100x}{x+5} \right]$ units of the product. If manufacturing costs for this product are ₹ 150 per unit, how much should the manufacturer spend on development and how much on advertisement to generate the largest profit.