

Problem 1

Use the method of Lagrange to find the closest point on the surface $z^2 = xy + 4$ to the origin.

Problem 2

For the function $f(x, y) = e^x \cos(y)$, use Taylor series to find a polynomial of degree 2 which approximates this function for points near the origin.

Problem 3

For the function $f(x, y) = \sin(x) \cos(y)$, use Taylor series to find a polynomial of degree 2 which approximates this function for points near the origin.

Problem 4

For the function $f(x, y) = e^x \ln(1 + y)$, use Taylor series to find a polynomial of degree 3 which approximates this function for points near the origin.