

(1) If $f(x, y) = \sin(x + xy) + x \cos y$ find f_{xx} and f_{yy}

(2) If $f(x, y) = x^4 y^4 + 3x^3 y^2 - 7x + 4$ show that $f_{xyx}(x, y) = f_{xxy}(x, y)$

(3) Find the local extrema of the function $f(x, y) = x^3 - 3x - 3y^2 + 6y$