EXERCISES #17

GLOBAL MAXIMA AND MINIMA, LAGRANGE MULTIPLIERS I

Exercise 1. Find the global maximum and minimum values of f on the given domain.

(1) $f(x, y) = x^2 - y^2$, on the domain $x^2 + y^2 = 1$
(2) $f(x, y) = xe^y$, on the domain $x^2 + y^2 = 2$
(3) $f(x, y) = xye^{-x^2-y^2}$, on the domain $x^2 + y^2 = 1$

Exercise 2. Find the global maximum and minimum values of f on the given domain.

(1) $f(x, y) = x^2 + y^2 + 4x - 4y$, on the domain $x^2 + y^2 \leq 9$
(2) $f(x, y) = \sin(x + y)$, on the domain $x^2 + xy + y^2 \leq 3$