EXERCISES #16

LOCAL MAXIMA AND MINIMA, CRITICAL POINTS

Exercise 1. Find the critical points and use the Second Derivative Test to determine whether they are local minima, local maxima or saddle points.

(1) $f(x, y) = xy - 2x - 2y - x^2 - y^2$
(2) $f(x, y) = y(e^x - 1)$
(3) $f(x, y) = 2 - x^4 + 2x^2 - y^2$
(4) $f(x, y) = (6x - x^2)(4y - y^2)$
(5) $f(x, y) = (x^2 + y^2)e^{-x}$
(6) $f(x, y) = \sin x \sin y$, in $-\pi < x < \pi$ and $-\pi < y < \pi$
(7) $f(x, y) = y^2 - 2y \cos x$, in $-1 \leq x \leq 7$ and $-3 \leq y \leq 3$
(8) $f(x, y) = -(x^2 - 1)^2 - (x^2y - x - 1)^2$
(9) $f(x, y) = 3xe^y - x^3 - e^{3y}$