HW #9

CALCULUS III

Question 1. Find the critical points of $f(x, y)$, and use the Second Derivative Test to determine whether they are local minima, local maxima or saddle points.

(1) $f(x, y) = (x^2 - 1)y$.
(2) $f(x, y) = (x^2 - 2x)(y^2 - 1)$.

Question 2. Find the global maximum and minimum values of

$$f(x, y) = x^2 y^2$$

on the domain

$$D = \{(x, y) \mid x^2 + y^4 = 3\}$$

Question 3. Find the global maximum and minimum values of

$$f(x, y) = xy$$

on the domain

$$D = \{(x, y) \mid x^2 + y^2 \leq 16\}$$

Question 4. Find the global maximum and minimum values of

$$f(x, y) = 2x^2 + 3y^2 - 4x$$

on the domain

$$D = \{(x, y) \mid x^2 + y^2 \leq 16\}$$