Math 233 Warm Up Problems

September 28, 2009

1. Find the maximum and minimum of the function $f(x) = x^3 - 3x^2 + 1$ on the interval $[1, 3]$.
   More importantly, what are the steps you followed to obtain your solution?
2. Find all local maximums and minimum of the function $f(x) = x^3 - 3x^2 + 1$.
   More importantly, what are the steps you followed to obtain your solution?
3. Find all points such that $\nabla f = \overrightarrow{0}$.
   (a) $f(x, y) = x^2 + 4y^2 - 4x$
   (b) $f(x, y) = x^3 + y^3 - 6xy$
   (c) $f(x, y) = xy + 2/x + 4/y$
   (d) $f(x, y) = (x - y)(xy - 1)$
   (e) $f(x, y) = x^2y - 6y^2 - 4x^2$

Lecture Problems

4. Find all critical points in Problem 3.