MATH 1080, SPRING 2006, HW SET 5

You need to show all your work and explain with following the guideline described in the class webpage to get the full credit. And please staple your HW papers.

HW 5 Due on Thursday 02/24/06

Before doing this HW, memorize all definitions and go over examples given in class and read the textbook.

1. For the following functions with the given interval as their domains,

(1) $f(x) = -x^3 + 3x^2 + 9x - 12$ on $[-2, 4]$

(2) $f(x) = 2\sin x - x$ on $[0, \frac{\pi}{2}]$

(3) $f(x) = 6\sqrt{x} - 4$ on $[0, 4]$

(4) $f(x) = e^x(x^2 - 2x + 1)$ on $[-2, 3]$

(5) $f(x) = (x-1)\ln(x-1)$ on $(1, \infty)$

find the followings:

(a) critical points of f

(b) inflection points of f

(c) When is f decreasing/ increasing?

(d) local maxima/local minima of f.

(e) the global maximum/the global minimum of f

(f) sketch the graph of $y = f(x)$.

2. Find the points on the parabola $y^2 = 4x$ that are closest to the point $(2, 0)$ and that minimum distant from $(2, 0)$.

3. Find local maxima and local minima of $f(x)$ whose derivative is given by $f'(x) = -(x-1)(x+2)^2$.

Date: February 21, 2006.