MATH 1120 **Quiz 2** **Fall 2000**

Name : _____

ID : _____

Please show the details of your work !!

1. Let $f(x) = x^3 - 3x + 6$.

   (a) Find the interval(s) where $f(x)$ is increasing and the interval(s) on which it is decreasing.

   (b) Find the relative maxima and relative minima of the function, if any.

2. Find the absolute maximum and the absolute minimum of $f(x) = \frac{x}{x^2+4}$ on [0,4].

3. For a function $f(x)$, we have the information below. Sketch the graph of the function f:

Domain	$(-\infty, 0) \cup (0, \infty)$
Vertical asymptotes	$x = 0$ and $f(x) \to -\infty$ as $x \to 0$
Horizontal asymptotes	$y = 0$
Intervals where f is $\nearrow$ and $\searrow$	$\nearrow$ on $(0, 2)$; $\searrow$ on $(-\infty, 0) \cup (2, \infty)$
Relative extrema	Relative maximum at $(2, 9)$
Concavity	Downward on $(-\infty, 0) \cup (0, 3)$; upward on $(3, \infty)$
Points of inflection	$(3, 8)$

4. A man wishes to have a rectangular-shaped 400-square-foot garden in his backyard. One side will be formed by a portion of the external wall of his house, the two sides starting from the wall will be constructed of pine boards, and the fourth side will be made of galvanized steel fencing material. If the pine board fencing costs \$10 per running foot and the steel fencing costs \$5 per running foot, determine the dimensions of the enclosure that can be erected at minimum cost.