NAME: SOLUTION

HOMEWORK FOR WORKSHEET 8 MATH 1300 DUE March 7, 2008

Find all intervals on which each of the following functions is increasing, decreasing, or constant.

1. $f(x) = x^3 - 4x$

$f'(x) = 3x^2 - 4$

$3x^2 - 4 = 0 \quad ; \quad x = \pm \frac{2}{\sqrt{3}}$

INCREASING: $(-\infty, -2/\sqrt{3})$ $(2/\sqrt{3}, \infty)$

DECREASING: $(-2/\sqrt{3}, 2/\sqrt{3})$

2. $f(x) = |x-1| + |x| + |x+2|$

$$f'(x) = \begin{cases} 1, & x>1 \\ -1, & x<1 \end{cases} + \begin{cases} 1, & x>0 \\ -1, & x<0 \end{cases} + \begin{cases} 1, & x>-2 \\ -1, & x<-2 \end{cases}$$

$$f'(x) = \begin{cases} 3, & x>1 \\ 1, & 0<x<1 \\ -1, & -2<x<0 \\ -3, & x<-2 \end{cases}$$

INCREASING:

$(1,3) \cup (3,\infty)$

DECREASING: $(-\infty,-3) \cup (-3,-1)$