

MATH 1000 – DALHOUSIE UNIVERSITY – SUMMER 2010

Assignment 6 – Due Monday July 26

1. Find the absolute maximum and minimum values of the following functions on the given closed interval.

(a) $f(x) = x^3 - 12$ on $[-3, 1]$.

(b) $f(x) = \frac{x^2}{x - 2}$ on $[3, 5]$

2. Let $f(x) = 8x^5 - 5x^4 - 20x^3$.

(a) Find the critical numbers of f .

(b) Find the intervals on which f is increasing and those on which f is decreasing.

(c) Use the first derivative test to determine if f has a maximum, minimum, or neither at each of its critical numbers.

3. Find the intervals of increase and decrease, the relative maximum and minimum values, the intervals of upwards and downwards concavity, and the point(s) of inflection for the function

$$f(x) = 2 + 3x - x^3.$$

*Because we didn't cover concavity / inflection in class, only find the intervals of increase and decrease and the relative extrema.

BONUS: Sketch the graph of $f(x)$ from question 3, using the information you have already found, as well as the x - and y -intercepts. The x -intercepts are -1 (a double root) and 2 . (DO NOT USE A GRAPHING CALCULATOR! If you do not explain each piece of the graph you have drawn, I will assume you have used a graphing calculator and you will not receive any bonus marks.)