

MAT 141
ASSIGNMENT 12

DUE DECEMBER 13, 2005

Please write proofs (or at least some reasoning if you can't give a full proof), not just answers! So if a problem asks whether some set has a maximum, do not just write "No", write "No, it doesn't because..."

As usual, you are allowed to use all the theorems stated in the appropriate chapters of the book (whether or not we have discussed them in class).

- (1) Section 4.21, problems 3, 4, 13
- (2) For each of the following functions, find
 - (a) critical points
 - (b) intervals where it is increasing/decreasing
 - (c) maximums and minimums
 - (d) intervals where it is convex/concave
 - (e) inflection points

Here are the functions:

$$x^3 + 3x + 1$$

$$\sin x + \cos x$$

$$e^{(-x^2)}$$