Calculus III *Fall 2004*
MA213:007–008 *Russell Brown*

A notebook is on reserve in the library. This notebook will contain solutions to the exams and solutions to a few homework problems.
Assignments to be graded.

- (20 points) Homework G. §12.5 #16, #34. Due Wednesday, 13 October 2004.
- (10 points) Homework H. §12.6 #26. Due Friday, 15 October 2004.
- (10 points) Homework I. §12.7 #40. Due Tuesday, 19 October 2004.
- (10 points) Homework J. §12.8 #26. Due Thursday, 21 October 2004.
- Notebooks are due on Friday, 22 October 2004. We will examine §§12.3–12.8.

Notebook assignments.
§12.7 # 1, 3, 5, 25, 29, 30, 33*, 35, 39, 40.
§12.8 # 1, 3, 10, 15, 23, 25, 29, 35, 42*.
§13.1 # 1, 7, 9, 10, 14*.

Comments:
§12.7 #33: You do not need to generate a graph by computer. Can you sketch a function with two local maxima and no minima?
§12.8 #42: Optional problem.
§13.1 #14: The problem does not ask you to find the volume. I assume this is a mistake. Please find the volume by a geometric argument.

Topics to be covered.

- §13.3 Local maxima and minima. Critical points. Using the second derivative test to classify critical points as local maxima, minima or saddle points. Absolute extreme values on closed and bounded sets.
- §13.2 Lagrange multipliers with one and two constraints.
- §13.1 Riemann sums. Definition of a double integral, properties.

An amusement: Criticize the following proof.
Suppose $x = y = 1$. Then

$$\begin{aligned} x^2 - y^2 &= 0 \\ (x+y)(x-y) &= 0 \cdot (x-y) \\ (x+y) &= 0 \quad \text{we have cancelled } x-y \text{ from both sides} \\ 2 &= 0 \quad \text{since } x = y = 1 \end{aligned}$$

October 11, 2004