**MATH 104/184: 10 Learning Goals**
August 16, 2012

## Learning Goals

We will finish our treatment on Optimization Problems in section 4.4 of Briggs Cochran. See the week 9 learning goals for suggested problems here. We will also start to look at linear approximations and differentials in this week in Section 4.5.

The specific learning goals for these sections are that by the end of Week 10 and review homework, students should be able to:

1. interpret the idea of optimization as the procedure used to make a system or a design as effective or functional as possible, and translate it into a mathematical procedure for finding the maximum/minimum of a function;

2. set up an optimization problem by identifying the *objective function* and all appropriate *constraints*; and

3. use calculus to solve optimization problems, and explain how they used the constraints in the solution process.

4. explain *linear approximation* (also known as *tangent line approximation* and the *linearization* of a function) using a series of figures like those in Section 4.5; this includes being able to relate the formula for linearization to the elements of such a picture (for example: what is the role of $a$, what is the role of $x$, where is the appropriate tangent line on the graph, where does the linear approximation appear in the picture); [4.5:2,3,4,35]

5. use linear approximations to estimate the values of functions near a given $x = a$; [4.5: 9, 10, 12, 16, 18, 22, 39, 43, 45, 47]

## Suggested Problems and Assignments

**Suggested Problems:** This week, all suggested problems from the text are:
Chapter 4.4: 2, 3, 4, 8, 11, 13, 15, 16, 20, 23, 25, 31, 33, 48, 55, 57.
There will be a handful of extra problems posted on the website.