MATH 104/184: Week 7 Learning Goals
August 16, 2012

Learning Goals

This week we cover two sections of material. The first topic is Related Rates, which is in section 3.10 of Briggs Cochran. The second is Maxima and Minima, which is covered in section 4.1.

Suggested problems that help build these skills are given as [section: question #s].

The specific learning goals for this week are that by the end of the week and review homework, you should be able to:

1. set up and solve related rates problems; [3.10: 3, 6, 11, 13, 16, 18, 23, 38]

   By this, we mean: Given a draining tank, falling ladder or moving ship problem, or provided a model (including equation) of another situation, you should be able to:

   (a) identify all the variables involved, make appropriate choices when a variable takes on constant values, and describe how they relate (using equations if relevant and/or writing ashort paragraph);

   (b) draw a picture of the situation if needed;

   (c) interpret rates in terms of derivatives with the appropriate variables; and

   (d) derive an equation which describes how the relevant rates are related and solve in that equation for the desired target rate.

2. define *absolute maximum* and *absolute minimum* and give examples of functions that illustrate these concepts; [4.1: 1, 10]

3. state the Extreme Value Theorem, and give examples that illustrate their understanding of this theorem: (1) examples where the EVT applies, and (2) examples where the EVT does not apply, but functions have absolute maxima or minima; [4.1: 4,5,13,14]

4. define *local maximum* and *local minimum* and give examples of functions that illustrate these concepts; [4.1: 7,8,20]

5. define *critical point* and apply this definition to find and classify critical points of a given function; [4.1: 24,26,27,29,44,46,58]

6. find the absolute maximum and absolute minimum of a given continuous function on a closed interval. [4.1: 50,53,54]

Suggested Problems

Suggested Problems: This week, all suggested problems from the text are:

Chapter 3.10: 3, 6, 11, 13, 16, 18, 23, 38.

Chapter 4.1: 1,4,5,7,8,10,13,14,20,24,26,27,29,44,46,50,53,54,58,71*.

(* means the problem is hard or is a proof-type question)