

Applied Calculus

Spring 2008

Module 2: Derivatives

## Introduction

In this module, you will meet the notion of the **derivative**. The observations that we made in Module 1 regarding average rates of change approximating the exact rate of change will be formalized, and we will see how the numbers we were trying to approximate can be determined explicitly and directly. Moreover, we will begin to see how the rate of change can be a powerful tool in understanding functions.

This is the first of the two theory modules. In these modules, we will excuse ourselves from the applications in order to develop technical skills. In particular, after completing this module, you will be able to determine the derivative function of most functions defined using algebraic formulas and other elementary functions.

This module has two primary goals. The first is to understand the meaning of the derivative function and use it to make precise observations about the behavior of functions. The second is to be able to differentiate functions when given their algebraic definitions.

## Schedule for the Module

Date	Lecture	Assignment
Mon 4 <sup>th</sup> Feb	Last Lecture of Module 1	<b>Read:</b> Sections 1.1 through 1.3 and 1.6
Wed 6 <sup>th</sup> Feb	Introduction to the Derivative and Basic Rules	<b>Homework:</b> 1.3: 5, 6*, 15, 16*, 21, 22*, 29, 49, 54*, 30*, 71, 72* 1.6: 5, 6*, 10*, 15, 26*, 27, 33 <b>Read:</b> Sections 3.1 and 3.2
Fri 8 <sup>th</sup> Feb	L2: Differentiating Combinations of Elementary Functions	<b>Homework:</b> 3.1: 5, 6*, 9, 11, 14*, 15, 19, 23, 23* 3.2: 2, 3*, 11, 12*, 13, 14*, 33, 34* <b>Read:</b> Sections 4.2 and 4.3
Mon 11 <sup>th</sup> Feb	L3: Differentiating Exponential Functions	<b>Homework:</b> 4.2: 25, 26*, 29, 30*, 33, 34*, 39, 43, 44* 4.3: 5, 6*, 13, 14*, 41, 42* <b>Read:</b> Sections 4.5 and 8.3
Wed 13 <sup>th</sup> Feb	L4: Differentiating Logarithmic, and Trigonometric Functions	<b>Homework:</b> 4.5: 1, 2*, 5, 6*, 11, 16*, 22*, 23 8.3: 3, 4*, 13, 14*, 27, 28*, 29, 30*
Fri 15 <sup>th</sup> Feb	Module Review	Study for Module exam
Fri 22 <sup>th</sup> Feb	Module 2 Exam	