

MATH 184, 2017W

Differential Calculus with Applications to Commerce and Social Sciences

Course Outline

- MATH 184 are courses in differential calculus, with applications and examples drawn primarily from business and economics. These courses are equivalent in technical content to MATH 100/180/102 and serve as a pre-requisite for any of MATH 101/103/105. The text book for MATH 184 is Single Variable Calculus: Early Transcendentals, First Edition, by Briggs and Cochran. Any supplemental notes for specific topics will be posted on the main course website.
- **Week 0** Introduction: Review of Exponentials, Logarithms, and Inverse Functions. Chapter 1.3
- **Week 1** A standard business problem from managerial economics. (Notes). An Introduction to Limits. Chapter 2.1, 2.2, and 2.3 (to the end of Quick Check 3 on p. 74)
- **Week 2** Continuous Functions. Chapter 2.6 (to p. 101 plus the definitions on page 103 and the intermediate Value Theorem). The Derivative. Chapter 3.1, 3.2
- **Week 3** Rules of Differentiation. Chapter 3.3, 3.4. Chapter 3.5: only the table of derivatives Theorem 3.13 on p. 167. (We return to this section at the end of the course.)
- **Week 4** Derivative as rate of change. Chapter 3.6. The Chain Rule. Chapter 3.7
- **Week 5** Implicit Differentiation. Chapter 3.8 to the end of the section on Slopes of Tangent Lines, plus material on the power rule with rational exponents. Derivatives of Logarithms and Exponentials. Chapter 3.9
- **Week 6** Derivatives of Logarithms and Exponentials Continued. Chapter 3.9. Applications: Elasticity of Demand (Notes to be posted online). Exponential Growth and Compound Interest. (Chapter 6.8 to the end of Example 3 plus online notes.)
- **Week 7** Related Rates. Chapter 3.11. Maxima and Minima. Chapter 4.1
- **Week 8** Information in the first and second derivatives. Chapter 4.2. Asymptotes from Chapter 2.5. Graphing functions. Chapter 4.3
- **Week 9** Optimization problems I. Chapter 4.4
- **Week 10** Optimization Problems Continued. Chapter 4.4. Linear Approximation. Chapter 4.5
- **Week 11** Approximating Functions with polynomials Chapter 9.1
- **Week 12** Approximating Functions with polynomials Continued Chapter 9.1. Inverse Trigonometric Functions. Chapter 3.10