

MATH 184 Course Outline

Differential Calculus with Applications to Commerce and Social Sciences (2012W-II)

MATH 184 deals with differential calculus, with applications and examples drawn primarily from business and economics. It is equivalent in technical content to MATH 100/180/102 and serves as a pre-requisite for any of MATH 101/103/105. The text book for MATH 184 is *Calculus: Early Transcendentals*, by W.L. Briggs and L. Cochran or the equivalent softcover *Calculus: Early Transcendentals*, Volume 1 (third custom edition for UBC), and the section numbers below refer to this text. Supplemental notes for specific topics will be posted on the main course website:

www.math.ubc.ca/~jfeng/Math184

- Week 0** Introduction: review of exponentials, logarithms, and inverse functions. §1.3.
- Week 1** A standard business problem from managerial economics. (Notes). An Introduction to limits. §§2.1, 2.2, and 2.3 (to the end of Quick Check 3 on p. 70).
- Week 2** Continuous functions. §2.6 (to p. 97 plus the Intermediate Value Thm). The Derivative. §3.1.
- Week 3** Rules of differentiation I. §§3.2, 3.3. §3.4: only the table of derivatives Theorem 3.13 on p. 159. (We return to this section at the end of the course.)
- Week 4** Derivative as rate of change. §3.5. The chain rule. §3.6.
- Week 5** Implicit differentiation. §3.7 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. §3.8.
- Week 6** Derivatives of logarithms and exponentials continued. §3.8. Applications: elasticity of demand (Notes to be posted online). Exponential growth and compound interest. (§6.8 to the end of Example 3 plus online notes).
- Week 7** Related rates. §3.10. Maxima and minima. §4.1.
- Week 8** Information in the first and second derivatives. §4.2. Asymptotes from §2.5. Graphing functions. §4.3.
- Week 9** Optimization problems I. §4.4.
- Week 10** Optimization problems continued. §4.4. Linear approximation. §4.5.
- Week 11** Approximating functions with polynomials §9.1.
- Week 12** Approximating functions with polynomials continued §9.1. Inverse trigonometric functions.