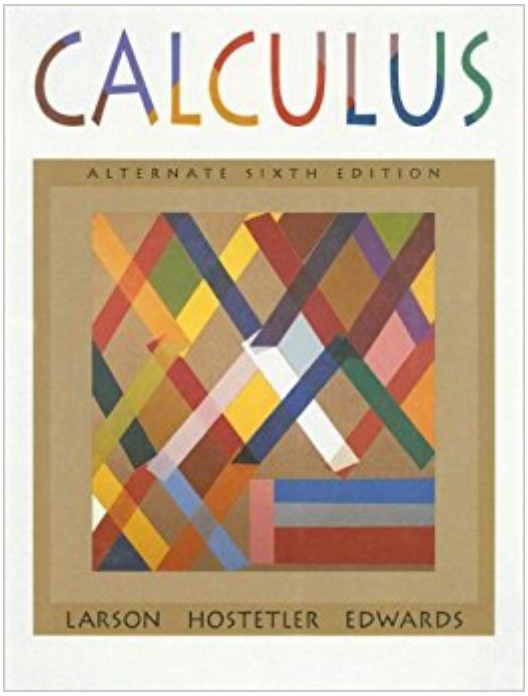
Calculus With Analytic Geometry, Alternate



Synopsis

This traditional text offers a balanced approach that combines the theoretical instruction of calculus with the best aspects of reform, including creative teaching and learning techniques such as the integration of technology, the use of real-life applications, and mathematical models. The Calculus with Analytic Geometry Alternate, 6/e, offers a late approach to trigonometry for those instructors who wish to introduce it later in their courses.

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Note: Each chapter concludes with Review Exercises. The chapter organization of this supplement is different from that of Calculus: Early Transcendental Functions; users should work by topic rather than by chapter. Correlation guidelines are available. 1. The Cartesian Plane and Functions 1.1 Real Numbers and the Real Line; 1.2 The Cartesian Plane; 1.3 Graphs of Equations; 1.4 Lines in the Plane; 1.5 Functions 2. Limits and Their Properties 2.1 An Introduction to Limits; 2.2 Techniques for Evaluating Limits; 2.3 Continuity; 2.4 Infinite Limits; 2.5 e-d Definition of Limits 3. Differentiation 3.1 The Derivative and the Tangent Line Problem; 3.2 Velocity, Acceleration, and Other Rates of Change; 3.3 Differentiation Rules for Powers, Constant Multiples, and Sums; 3.4 Differentiation Rules for Products and Quotients; 3.5 The Chain Rule; 3.6 Implicit Differentiation; 3.7 Related Rates 4. Applications of Differentiation 4.1 Extrema on an Interval; 4.2 Rolle’s Theorem and the Mean Value Theorem; 4.3 Increasing and Decreasing Functions and the First Derivative Test; 4.4 Concavity and the Second Derivative Test; 4.5 Limits at Infinity; 4.6 A Summary of Curve Sketching;

4.7 Optimization Problems; 4.8 Newton's Method; 4.9 Differentials; 4.10 Business and Economics Applications 5. Integration 5.1 Antiderivatives and Indefinite Integration; 5.2 Area; 5.3 Riemann Sums and the Definite Integral; 5.4 The Fundamental Theorem of Calculus; 5.5 Integration by Substitution; 5.6 Numerical Integration 6. Applications of Integration 6.1 Area of a Region Between Two Curves; 6.2 Volume: The Disc Method; 6.3 Volume: The Shell Method; 6.4 Arc Length and Surfaces of Revolution; 6.5 Work; 6.6 Fluid Pressure and Fluid Force; 6.7 Moments, Centers of Mass, and Centroids 7. Exponential and Logarithmic Functions 7.1 Exponential Functions; 7.2 Differentiation and Integration of Exponential Functions; 7.3 Inverse Functions; 7.4 Logarithmic Functions; 7.5 Logarithmic Functions and Differentiation; 7.6 Logarithmic Functions and Integration; 7.7 Growth and Decay; 7.8 Indeterminate Forms and L'Hopital's Rule 8. Trigonometric Functions and Inverse Trigonometric Functions 8.1 Review of Trigonometric Functions; 8.2 Graphs and Limits of Trigonometric Functions; 8.3 Derivatives of Trigonometric Functions; 8.4 Integrals of Trigonometric Functions; 8.5 Inverse Trigonometric Functions and Differentiation; 8.6 Inverse Trigonometric Functions: Integration and Completing the Square; 8.7 Hyperbolic Functions 9. Integration Techniques and Improper Integrals 9.1 Basic Integration Formulas; 9.2 Integration by Parts; 9.3 Trigonometric Integrals; 9.4 Trigonometric Substitution; 9.5 Partial Fractions; 9.6 Integration by Tables and Other Integration Techniques; 9.7 Improper Integrals 10. Infinite Series 10.1 Sequences; 10.2 Series and Convergence; 10.3 The Integral Test and p-Series; 10.4 Comparisons of Series; 10.5 Alternating Series; 10.6 The Ratio and Root Tests; 10.7 Taylor Polynomials and Approximations; 10.8 Power Series; 10.9 Representation of Functions by Power Series; 10.10 Taylor and Maclaurin Series 11. Conic Sections 11.1 Parabolas; 11.2 Ellipses; 11.3 Hyperbolas; 11.4 Rotation and the General Second-Degree Equation 12. Plane Curves, Parametric Equations, and Polar Coordinates 12.1 Plane Curves and Parametric Equations; 12.2 Parametric Equations and Calculus; 12.3 Polar Coordinates and Polar Graphs; 12.4 Tangent Lines and Curve Sketching in Polar Coordinates; 12.5 Area and Arc Length in Polar Coordinates; 12.6 Polar Equations for Conics and Kepler's Laws 13. Vectors and Curves in the Plane 13.1 Vectors in the Plane; 13.2 The Dot Product of Two Vectors; 13.3 Vector-Valued Functions; 13.4 Velocity and Acceleration; 13.5 Tangent Vectors and Normal Vectors; 13.6 Arc Length and Curvature 14. Solid Analytic Geometry and Vectors in Space 14.1 Space Coordinates and Vectors in Space; 14.2 The Cross Product of Two Vectors in Space; 14.3 Lines and Planes in Space; 14.4 Surfaces in Space; 14.5 Curves and Vector-Valued Functions in Space; 14.6 Tangent Vectors, Normal Vectors, and Curvature in Space 15. Functions of Several Variables 15.1 Introduction to Functions of Several Variables; 15.2 Limits and Continuity; 15.3 Partial Derivatives; 15.4 Differentials; 15.5 Chain Rules

for Functions of Several Variables; 15.6 Directional Derivatives and Gradients; 15.7 Tangent Planes and Normal Lines; 15.8 Extrema of Functions of Two Variables; 15.9 Applications of Extrema of Functions of Two Variables; 15.10 Lagrange Multipliers 16. Multiple Integration 16.1 Iterated Integrals and Area in the Plane; 16.2 Double Integrals and Volume; 16.3 Change of Variables: Polar Coordinates; 16.4 Center of Mass and Moments of Inertia; 16.5 Surface Area; 16.6 Triple Integrals and Applications; 16.7 Cylindrical and Spherical Coordinates; 16.8 Triple Integrals in Cylindrical and Spherical Coordinates; 16.9 Change of Variables: Jacobians 17. Vector Analysis 17.1 Vector Fields; 17.2 Line Integrals; 17.3 Conservative Vector Fields and Independence of Path; 17.4 Green's Theorem; 17.5 Parametric Surfaces; 17.6 Surface Integrals; 17.7 Divergence Theorem; 17.8 Stokes's Theorem 18. Differential Equations 18.1 Definitions and Basic Concepts; 18.2 Separation of Variables in First-Order Equations; 18.3 Exact First-Order Equations; 18.4 First-Order Linear Differential Equations; 18.5 Second-Order Homogeneous Linear Equations; 18.6 Second-Order Nonhomogeneous Linear Equations; 18.7 Series Solutions of Differential Equations Appendixes: A. Proofs of Selected Theorems; B. Basic Differentiation Rules for Elementary Functions; C. Integration Tables Answers to Odd-Numbered Exercises

Dr. Ron Larson is a professor of mathematics at The Pennsylvania State University, where he has taught since 1970. He received his Ph.D. in mathematics from the University of Colorado and is considered the pioneer of using multimedia to enhance the learning of mathematics, having authored over 30 software titles since 1990. Dr. Larson conducts numerous seminars and in-service workshops for math educators around the country about using computer technology as an instructional tool and motivational aid. He is the recipient of the 2014 William Holmes McGuffey Longevity Award for CALCULUS: EARLY TRANSCENDENTAL FUNCTIONS, the 2014 Text and Academic Authors Association TEXTY Award for PRECALCULUS, the 2012 William Holmes McGuffey Longevity Award for CALCULUS: AN APPLIED APPROACH, and the 1996 Text and Academic Authors Association TEXTY Award for INTERACTIVE CALCULUS (a complete text on CD-ROM that was the first mainstream college textbook to be offered on the Internet). Dr. Larson authors numerous textbooks including the best-selling Calculus series published by Cengage Learning.The Pennsylvania State University, The Behrend College Bio: Robert P. Hostetler received his Ph.D. in mathematics from The Pennsylvania State University in 1970. He has taught at Penn State for many years and has authored several calculus, precalculus, and intermediate algebra textbooks. His teaching specialties include remedial algebra, calculus, and math education, and his research interests include mathematics education and textbooks.Dr. Bruce H. Edwards is Professor

of Mathematics at the University of Florida. Professor Edwards received his B.S. in Mathematics from Stanford University and his Ph.D. in Mathematics from Dartmouth College. He taught mathematics at a university near BogotÃ¡, Colombia, as a Peace Corps volunteer. While teaching at the University of Florida, Professor Edwards has won many teaching awards, including Teacher of the Year in the College of Liberal Arts and Sciences, Liberal Arts and Sciences Student Council Teacher of the Year, and the University of Florida Honors Program Teacher of the Year. He was selected by the Office of Alumni Affairs to be the Distinguished Alumni Professor for 1991-1993. Professor Edwards has taught a variety of mathematics courses at the University of Florida, from first-year calculus to graduate-level classes in algebra and numerical analysis. He has been a frequent speaker at research conferences and meetings of the National Council of Teachers of Mathematics. He has also coauthored a wide range of award winning mathematics textbooks with Professor Ron Larson.

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