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Titolo	Applied Calculus with R // by Thomas J. Pfaff
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2023
ISBN	3-031-28571-9
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (520 pages)
Disciplina	515.0285
Soggetti	Mathematical statistics Computer science - Mathematics Stochastic processes Calculus Mathematical Statistics Mathematical Applications in Computer Science Stochastic Calculus Càlcul Processament de dades R (Llenguatge de programació) Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	A Brief Introduction to R -- Describing a Graph -- The Function Gallery -- I: Change and the Derivative -- How Fast is CO2 Increasing? -- The Idea of the Derivative -- Formulas Quantifying Change.-The Microscope Equation -- Successive Approximations to Estimate Derivatives -- The Derivative Graphically -- The Formal Derivative as a Limit -- Basic Derivative Rules -- Produce Rule -- Quotient Rule -- Chain Rule -- Derivatives with R -- End Behavior of a Function - L'Hospital's Rule -- II: Applications of the Derivative -- How Do We Know the Shape of a Function? -- Finding Extremes -- Optimization -- Derivatives of Functions of Two Variables -- Related Rates -- Surge Function -- Differential Equations - Preliminaries -- Differential Equations - Population Growth Models -- Differential Equations -

Predator Prey -- Differential equations - SIR Model -- Project: The Gini Coefficient - Prelude to Section III -- III: Accumulation and the Integral -- Area Under Curves -- The Accumulation Function -- The Fundamental Theorem of Calculus -- Techniques of Integration - The u Substitution -- Techniques of Integration - Integration by Parts -- IV: Appendices - Algebra Review -- Algebra Review - Functions and Graphs -- Algebra Review - Adding and Multiplying Fractions -- Algebra Review - Exponents -- Algebra Review - Lines -- Algebra Review - Expanding, Factoring, and Roots -- Algebra Review - Function Composition -- Glossary -- Answers to Odd Problems -- R Code for Figures.

Sommario/riassunto

This textbook integrates scientific programming with the use of R and uses it both as a tool for applied problems and to aid in learning calculus ideas. Adding R, which is free and used widely outside academia, introduces students to programming and expands the types of problems students can engage. There are no expectations that a student has any coding experience to use this text. While this is an applied calculus text including real world data sets, a student that decides to go on in mathematics should develop sufficient algebraic skills so that they can be successful in a more traditional second semester calculus course. Hopefully, the applications provide some motivation to learn techniques and theory and to take additional math courses. The book contains chapters in the appendix for algebra review as algebra skills can always be improved. Exercise sets and projects are included throughout with numerous exercises based on graphs.
