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KEY=2 - WHEELER SUTTON

Introduction to Real Analysis

Prentice Hall Using an extremely clear and informal approach, this book introduces readers to a rigorous understanding of mathematical analysis and presents challenging math concepts as clearly as possible. The real number system. Differential calculus of functions of one variable. Riemann integral functions of one variable. Integral calculus of real-valued functions. Metric Spaces. For those who want to gain an understanding of mathematical analysis and challenging mathematical concepts.

Mathematics for Machine Learning

Cambridge University Press Distills key concepts from linear algebra, geometry, matrices, calculus, optimization, probability and statistics that are used in machine learning.

Basic Analysis II

Introduction to Real Analysis

Createspace Independent Publishing Platform Version 2.0. The second volume of Basic Analysis, a first course in mathematical analysis. This volume is the second semester material for a year-long sequence for advanced undergraduates or masters level students. This volume started with notes for Math 522 at University of Wisconsin-Madison, and then was heavily revised and modified for teaching Math 4153/5053 at Oklahoma State University. It covers differential calculus in several variables, line integrals, multivariable Riemann integral including a basic case of Green's Theorem, and topics on power series, Arzelà-Ascoli, Stone-Weierstrass, and Fourier Series. See <http://www.jirka.org/ra/> Table of Contents (of this volume II): 8. Several Variables and Partial Derivatives 9. One Dimensional Integrals in Several Variables 10. Multivariable Integral 11. Functions as Limits

Analysis I

Third Edition

Springer This is part one of a two-volume book on real analysis and is intended for senior undergraduate students of mathematics who have already been exposed to calculus. The emphasis is on rigour and foundations of analysis. Beginning with the construction of the number systems and set theory, the book discusses the basics of analysis (limits, series, continuity, differentiation, Riemann integration), through to power series, several variable calculus and Fourier analysis, and then finally the Lebesgue integral. These are almost entirely set in the concrete setting of the real line and Euclidean spaces, although there is some material on abstract metric and topological spaces. The book also has appendices on mathematical logic and the decimal system. The entire text (omitting some less central topics) can be taught in two quarters of 25-30 lectures each. The course material is deeply intertwined with the exercises, as it is intended that the student actively learn the material (and practice thinking and writing rigorously) by proving several of the key results in the theory.

Real Analysis (Classic Version)

Math Classics Originally published in 2010, reissued as part of Pearson's modern classic series.

Basic Analysis

Introduction to Real Analysis

Createspace Independent Publishing Platform Also issued as free online textbook continuously updated. Volume I started its life as lecture notes in 2012 and was thoroughly revised in 2016 (version 4.0), volume II (version 1.0) continues the inquiry with continuous chapter numbering. (Introduction to volume 2)

An Introduction to Mathematical Modeling

Courier Corporation Accessible text features over 100 reality-based examples pulled from the science, engineering, and operations research fields. Prerequisites: ordinary differential equations, continuous probability. Numerous references. Includes 27 black-and-white figures. 1978 edition.

An Introduction to Numerical Methods and Analysis

John Wiley & Sons Praise for the First Edition ". . . outstandingly appealing with regard to its style, contents, considerations of requirements of practice, choice of examples, and exercises." —Zentrablatt Math ". . . carefully structured with many detailed worked examples . . ." —The Mathematical Gazette ". . . an up-to-date and user-friendly account . . ." —Mathematika An Introduction to Numerical Methods and Analysis addresses the mathematics underlying approximation and scientific computing and successfully explains where approximation methods come from, why they sometimes work (or don't

work), and when to use one of the many techniques that are available. Written in a style that emphasizes readability and usefulness for the numerical methods novice, the book begins with basic, elementary material and gradually builds up to more advanced topics. A selection of concepts required for the study of computational mathematics is introduced, and simple approximations using Taylor's Theorem are also treated in some depth. The text includes exercises that run the gamut from simple hand computations, to challenging derivations and minor proofs, to programming exercises. A greater emphasis on applied exercises as well as the cause and effect associated with numerical mathematics is featured throughout the book. An Introduction to Numerical Methods and Analysis is the ideal text for students in advanced undergraduate mathematics and engineering courses who are interested in gaining an understanding of numerical methods and numerical analysis.

Advanced Calculus

Revised

World Scientific Publishing Company An authorised reissue of the long out of print classic textbook, Advanced Calculus by the late Dr Lynn Loomis and Dr Shlomo Sternberg both of Harvard University has been a revered but hard to find textbook for the advanced calculus course for decades. This book is based on an honors course in advanced calculus that the authors gave in the 1960's. The foundational material, presented in the unstarred sections of Chapters 1 through 11, was normally covered, but different applications of this basic material were stressed from year to year, and the book therefore contains more material than was covered in any one year. It can accordingly be used (with omissions) as a text for a year's course in advanced calculus, or as a text for a three-semester introduction to analysis. The prerequisites are a good grounding in the calculus of one variable from a mathematically rigorous point of view, together with some acquaintance with linear algebra. The reader should be familiar with limit and continuity type arguments and have a certain amount of mathematical sophistication. As possible introductory texts, we mention Differential and Integral Calculus by R Courant, Calculus by T Apostol, Calculus by M Spivak, and Pure Mathematics by G Hardy. The reader should also have some experience with partial derivatives. In overall plan the book divides roughly into a first half which develops the calculus (principally the differential calculus) in the setting of normed vector spaces, and a second half which deals with the calculus of differentiable manifolds.

Mathematical Analysis

The Trillia Group

A Problem Book in Real Analysis

Springer Science & Business Media Education is an admirable thing, but it is well to remember from time to time that nothing worth knowing can be taught. Oscar Wilde, "The Critic as Artist," 1890. Analysis is a profound subject; it is neither easy to understand nor summarize. However, Real Analysis can be discovered by solving problems. This book aims to give independent students the opportunity to discover Real Analysis by themselves through problem solving. The depth and complexity of the theory of Analysis can be appreciated by taking a glimpse at its developmental history. Although Analysis was conceived in the 17th century during the Scientific Revolution, it has taken nearly two hundred years to establish its theoretical basis. Kepler, Galileo, Descartes, Fermat, Newton and Leibniz were among those who contributed to its genesis. Deep conceptual changes in Analysis were brought about in the 19th century by Cauchy and Weierstrass. Furthermore, modern concepts such as open and closed sets were introduced in the 1900s. Today nearly every undergraduate mathematics program requires at least one semester of Real Analysis. Often, students consider this course to be the most challenging or even intimidating of all their mathematics major requirements. The primary goal of this book is to alleviate those concerns by systematically solving the problems related to the core concepts of most analysis courses. In doing so, we hope that learning analysis becomes less taxing and thereby more satisfying.

Fundamentals of Mathematical Statistics

Sultan Chand & Sons Knowledge updating is a never-ending process and so should be the revision of an effective textbook. The book originally written fifty years ago has, during the intervening period, been revised and reprinted several times. The authors have, however, been thinking, for the last few years that the book needed not only a thorough revision but rather a substantial rewriting. They now take great pleasure in presenting to the readers the twelfth, thoroughly revised and enlarged, Golden Jubilee edition of the book. The subject-matter in the entire book has been re-written in the light of numerous criticisms and suggestions received from the users of the earlier editions in India and abroad. The basis of this revision has been the emergence of new literature on the subject, the constructive feedback from students and teaching fraternity, as well as those changes that have been made in the syllabi and/or the pattern of examination papers of numerous universities. Knowledge updating is a never-ending process and so should be the revision of an effective textbook. The book originally written fifty years ago has, during the intervening period, been revised and reprinted several times. The authors have, however, been thinking, for the last few years that the book needed not only a thorough revision but rather a substantial rewriting. They now take great pleasure in presenting to the readers the twelfth, thoroughly revised and enlarged, Golden Jubilee edition of the book. The subject-matter in the entire book has been re-written in the light of numerous criticisms and suggestions received from the users of the earlier editions in India and abroad. The basis of this revision has been the emergence of new literature on the subject, the constructive feedback from students and teaching fraternity, as well as those changes that have been made in the syllabi and/or the pattern of examination papers of numerous universities. Some prominent additions are given below: 1. Variance of Degenerate Random Variable 2. Approximate Expression for Expectation and Variance 3. Lyapounov's Inequality 4. Holder's Inequality 5. Minkowski's Inequality 6. Double Expectation Rule or Double-E Rule and many others

A First Course in Real Analysis

Springer Science & Business Media Mathematics is the music of science, and real analysis is the Bach of mathematics. There are many other foolish things I could say about the subject of this book, but the foregoing will give the reader an idea of where my heart lies. The present book was written to support a first course in real analysis, normally taken after a year of elementary calculus. Real analysis is, roughly speaking, the modern setting for Calculus, "real" alluding to the field of real numbers that underlies it all. At center stage are functions, defined and taking values in sets of real numbers or in sets (the plane, 3-space, etc.) readily derived from the real numbers; a first course in real analysis traditionally places the emphasis on real-valued functions defined on sets of real numbers. The agenda for the course: (1) start with the axioms for the field of real numbers, (2) build, in one semester and with appropriate rigor, the foundations of calculus (including the "Fundamental Theorem"), and, along the way, (3) develop those skills and attitudes that enable us to continue learning mathematics on our own. Three decades of experience with the exercise have not diminished my astonishment that it can be done.

Principles of Mathematical Analysis

McGraw-Hill Publishing Company The third edition of this well known text continues to provide a solid foundation in mathematical analysis for undergraduate and first-year graduate students. The text begins with a discussion of the real number system as a complete ordered field. (Dedekind's construction is now treated in an appendix to Chapter I.) The topological background needed for the development of convergence, continuity, differentiation and integration is provided in Chapter 2. There is a new section on the gamma function, and many new and interesting exercises are included. This text is part of the Walter Rudin Student Series in Advanced Mathematics.

Mathematical Analysis

How to Study for a Mathematics Degree

OUP Oxford Every year, thousands of students go to university to study mathematics (single honours or combined with another subject). Many of these students are extremely intelligent and hardworking, but even the best will, at some point, struggle with the demands of making the transition to advanced mathematics. Some have difficulty adjusting to independent study and to learning from lectures. Other struggles, however, are more fundamental: the mathematics shifts in focus from calculation to proof, so students are expected to interact with it in different ways. These changes need not be mysterious - mathematics education research has revealed many insights into the adjustments that are necessary - but they are not obvious and they do need explaining. This no-nonsense book translates these research-based insights into practical advice for a student audience. It covers every aspect of studying for a mathematics degree, from the most abstract intellectual challenges to the everyday business of interacting with lecturers and making good use of study time. Part 1 provides an in-depth discussion of advanced mathematical thinking, and explains how a student will need to adapt and extend their existing skills in order to develop a good understanding of undergraduate mathematics. Part 2 covers study skills as these relate to the demands of a mathematics degree. It suggests practical approaches to learning from lectures and to studying for examinations while also allowing time for a fulfilling all-round university experience. The first subject-specific guide for students, this friendly, practical text will be essential reading for anyone studying mathematics at university.

Partial Differential Equations

An Introduction

John Wiley & Sons Partial Differential Equations presents a balanced and comprehensive introduction to the concepts and techniques required to solve problems containing unknown functions of multiple variables. While focusing on the three most classical partial differential equations (PDEs)—the wave, heat, and Laplace equations—this detailed text also presents a broad practical perspective that merges mathematical concepts with real-world application in diverse areas including molecular structure, photon and electron interactions, radiation of electromagnetic waves, vibrations of a solid, and many more. Rigorous pedagogical tools aid in student comprehension; advanced topics are introduced frequently, with minimal technical jargon, and a wealth of exercises reinforce vital skills and invite additional self-study. Topics are presented in a logical progression, with major concepts such as wave propagation, heat and diffusion, electrostatics, and quantum mechanics placed in contexts familiar to students of various fields in science and engineering. By understanding the properties and applications of PDEs, students will be equipped to better analyze and interpret central processes of the natural world.

Mathematics for Computer Science

This book covers elementary discrete mathematics for computer science and engineering. It emphasizes mathematical definitions and proofs as well as applicable methods. Topics include formal logic notation, proof methods; induction, well-ordering; sets, relations; elementary graph theory; integer congruences; asymptotic notation and growth of functions; permutations and combinations, counting principles; discrete probability. Further selected topics may also be covered, such as recursive definition and structural induction; state machines and invariants; recurrences; generating functions.

A Basic Course in Real Analysis

CRC Press Based on the authors' combined 35 years of experience in teaching, A Basic Course in Real Analysis introduces students to the aspects of real analysis in a friendly way. The authors offer insights into the way a typical mathematician works observing patterns, conducting experiments by means of looking at or creating examples, trying to understand the underlying principles, and coming up with guesses or conjectures and then proving them rigorously based on his or her explorations. With more than 100 pictures, the book creates interest in real analysis by encouraging students to think geometrically. Each difficult proof is prefaced by a strategy and explanation of how the strategy is translated into rigorous and precise proofs. The authors then explain the mystery and role of inequalities in analysis to train students to arrive at estimates that will be useful for proofs. They highlight the role of the least upper bound property of real numbers, which underlies all crucial results in real analysis. In addition, the book demonstrates analysis as a qualitative as well as quantitative study of functions, exposing students to arguments that fall under hard analysis. Although there are many books available on this subject, students often find it difficult to learn the essence of analysis on their own or after going through a course on real analysis. Written in a conversational tone, this book explains the hows and whys of real analysis and provides guidance that makes readers think at every stage.

Complex Variables and Applications

Introduction to Real Analysis

Mathematical Statistics

Springer Science & Business Media This graduate textbook covers topics in statistical theory essential for graduate students preparing for work on a Ph.D. degree in statistics. This new edition has been revised and updated and in this fourth printing, errors have been ironed out. The first chapter provides a quick overview of concepts and results in measure-theoretic probability theory that are useful in statistics. The second chapter introduces some fundamental concepts in statistical decision theory and inference. Subsequent chapters contain detailed studies on some important topics: unbiased estimation, parametric estimation, nonparametric estimation, hypothesis testing, and confidence sets. A large number of exercises in each chapter provide not only practice problems for students, but also many additional results.

An Introduction to Measure Theory

American Mathematical Soc. This is a graduate text introducing the fundamentals of measure theory and integration theory, which is the foundation of modern real analysis. The text focuses first on the concrete setting of Lebesgue measure and the Lebesgue integral (which in turn is motivated by the more classical concepts of Jordan measure and the Riemann integral), before moving on to abstract measure and integration theory, including the standard convergence theorems, Fubini's theorem, and the Carathéodory extension theorem. Classical differentiation theorems, such as the Lebesgue and Rademacher differentiation theorems, are also covered, as are connections with probability theory. The material is intended to cover a quarter or semester's worth of material for a first graduate course in real analysis. There is an emphasis in the text on tying together the abstract and the concrete sides of the subject, using the latter to illustrate and motivate the former. The central role of key principles (such as Littlewood's three principles) as providing guiding intuition to the subject is also emphasized. There are a large number of exercises throughout that develop key aspects of the theory, and are thus an integral component of the text. As a supplementary section, a discussion of general problem-solving strategies in analysis is also given. The last three sections discuss optional topics related to the main matter of the book.

The Real Analysis Lifesaver

All the Tools You Need to Understand Proofs

Princeton University Press Real analysis is difficult. For most students, in addition to learning new material about real numbers, topology, and sequences, they are also learning to read and write rigorous proofs for the first time. The Real Analysis Lifesaver is an innovative guide that helps students through their first real analysis course while giving them the solid foundation they need for further study in proof-based math. Rather than presenting polished proofs with no explanation of how they were devised, The Real Analysis Lifesaver takes a two-step approach, first showing students how to work backwards to solve the crux of the problem, then showing them how to write it up formally. It takes the time to provide plenty of examples as well as guided "fill in the blanks" exercises to solidify understanding. Newcomers to real analysis can feel like they are drowning in new symbols, concepts, and an entirely new way of thinking about math. Inspired by the popular Calculus Lifesaver, this book is refreshingly straightforward and full of clear explanations, pictures, and humor. It is the lifesaver that every drowning student needs. The essential "lifesaver" companion for any course in real analysis. Clear, humorous, and easy-to-read style Teaches students not just what the proofs are, but how to do them—in more than 40 worked-out examples Every new definition is accompanied by examples and important clarifications Features more than 20 "fill in the blanks" exercises to help internalize proof techniques Tried and tested in the classroom

Basic Real Analysis

Springer Science & Business Media Systematically develop the concepts and tools that are vital to every mathematician, whether pure or applied, aspiring or established A comprehensive treatment with a global view of the subject, emphasizing the connections between real analysis and other branches of mathematics Included throughout are many examples and hundreds of problems, and a separate 55-page section gives hints or complete solutions for most.

Quaternion Algebras

Springer Nature This open access textbook presents a comprehensive treatment of the arithmetic theory of quaternion algebras and orders, a subject with applications in diverse areas of mathematics. Written to be accessible and approachable to the graduate student reader, this text collects and synthesizes results from across the literature. Numerous pathways offer explorations in many different directions, while the unified treatment makes this book an essential reference for students and researchers alike. Divided into five parts, the book begins with a basic introduction to the noncommutative algebra underlying the theory of quaternion algebras over fields, including the relationship to quadratic forms. An in-depth exploration of the arithmetic of quaternion algebras and orders follows. The third part considers analytic aspects, starting with zeta functions and then passing to an adelic approach, offering a pathway from local to global that includes strong approximation. Applications of unit groups of quaternion orders to hyperbolic geometry and low-dimensional topology follow, relating geometric and topological properties to arithmetic invariants. Arithmetic geometry completes the volume, including quaternionic aspects of modular forms, supersingular elliptic curves, and the moduli of QM abelian surfaces. Quaternion Algebras encompasses a vast wealth of knowledge at the intersection of many fields. Graduate students interested in algebra, geometry, and number theory will appreciate the many avenues and connections to be explored. Instructors will find numerous options for constructing introductory and advanced courses, while researchers will value the all-embracing treatment. Readers are assumed to have some familiarity with algebraic number theory and commutative algebra, as well as the fundamentals of linear algebra, topology, and complex analysis. More advanced topics call upon additional background, as noted, though essential concepts and motivation are recapped throughout.

Elementary Real Analysis

CUP Archive

Advanced Real Analysis

Springer Science & Business Media * Presents a comprehensive treatment with a global view of the subject * Rich in examples, problems with hints, and solutions, the book makes a welcome addition to the library of every mathematician

Calculus

Wellesley-Cambridge Press Gilbert Strang's clear, direct style and detailed, intensive explanations make this textbook ideal as both a course companion and for self-study. Single variable and multivariable calculus are covered in depth. Key examples of the application of calculus to areas such as physics, engineering and economics are included in order to enhance students' understanding. New to the third edition is a chapter on the 'Highlights of calculus', which accompanies the popular video lectures by the author on MIT's OpenCourseWare. These can be accessed from math.mit.edu/~gs.

Complex Analysis

Princeton University Press With this second volume, we enter the intriguing world of complex analysis. From the first theorems on, the elegance and sweep of the results is evident. The starting point is the simple idea of extending a function initially given for real values of the argument to one that is defined when the argument is complex. From there, one proceeds to the main properties of holomorphic functions, whose proofs are generally short and quite illuminating: the Cauchy theorems, residues, analytic continuation, the argument principle. With this background, the reader is ready to learn a wealth of additional material connecting the subject with other areas of mathematics: the Fourier transform treated by contour integration, the zeta function and the prime number theorem, and an introduction to elliptic functions culminating in their application to combinatorics and number theory. Thoroughly developing a subject with many ramifications, while striking a careful balance between conceptual insights and the technical underpinnings of rigorous analysis, Complex Analysis will be welcomed by students of mathematics, physics, engineering and other sciences. The Princeton Lectures in Analysis represents a sustained effort to introduce the core areas of mathematical analysis while also illustrating the organic unity between them. Numerous examples and applications throughout its four planned volumes, of which Complex Analysis is the second, highlight the far-reaching consequences of certain ideas in analysis to other fields of mathematics and a variety of sciences. Stein and Shakarchi move from an introduction addressing Fourier series and integrals to in-depth considerations of complex analysis; measure and integration theory, and Hilbert spaces; and, finally, further topics such as functional analysis, distributions and elements of probability theory.

Real Analysis

Cambridge University Press A text for a first graduate course in real analysis for students in pure and applied mathematics, statistics, education, engineering, and economics.

Real and Complex Analysis (Third Edition)

Shi Fen Xi Yu Fu Fen Xi (Ying Wen Ban Yuan Shu Di 3 Ban Dian Cang Ban) Mathematics for Degree Students (For B.Sc. Third Year)

S. Chand Publishing Mathematics for Degree Students B.Sc.IIIRD Yr

Engineering Mathematics with Examples and Applications

Academic Press Engineering Mathematics with Examples and Applications provides a compact and concise primer in the field, starting with the foundations, and then gradually developing to the advanced level of mathematics that is necessary for all engineering disciplines. Therefore, this book's aim is to help undergraduates rapidly develop the fundamental knowledge of engineering mathematics. The book can also be used by graduates to review and refresh their mathematical skills. Step-by-step worked examples will help the students gain more insights and build sufficient confidence in engineering mathematics and problem-solving. The main approach and style of this book is informal, theorem-free, and practical. By using an informal and theorem-free approach, all fundamental mathematics topics required for engineering are covered, and readers can gain such basic knowledge of all important topics without worrying about rigorous (often boring) proofs. Certain rigorous proof and derivatives are presented in an informal way by direct, straightforward mathematical operations and calculations, giving students the same level of fundamental knowledge without any tedious steps. In addition, this practical approach provides over 100 worked examples so that students can see how each step of mathematical problems can be derived without any gap or jump in steps. Thus, readers can build their understanding and mathematical confidence gradually and in a step-by-step manner. Covers fundamental engineering topics that are presented at the right level, without worry of rigorous proofs Includes step-by-step worked examples (of which 100+ feature in the work) Provides an emphasis on numerical methods, such as root-finding algorithms, numerical integration, and numerical methods of differential equations Balances theory and practice to aid in practical problem-solving in various contexts and applications

Principia Mathematica

Cambridge University Press Principia Mathematica was first published in 1910-13; this is the ninth impression of the second edition of 1925-7. The Principia has long been recognised as one of the intellectual landmarks of the century. It was the first book to show clearly the close relationship between mathematics and formal logic. Starting from a minimal number of axioms, Whitehead and Russell display the structure of both kinds of thought. No other book has had such an influence on the subsequent history of mathematical philosophy.

Numerical Analysis

Cengage Learning This well-respected text gives an introduction to the theory and application of modern numerical approximation techniques for students taking a one- or two-semester course in numerical analysis. With an accessible treatment that only requires a calculus prerequisite, Burden and Faires explain how, why, and when approximation techniques can be expected to work, and why, in some situations, they fail. A wealth of examples and exercises develop students' intuition, and demonstrate the subject's practical applications to important everyday problems in math, computing, engineering, and physical science disciplines. The first book of its kind built from the ground up to serve a diverse undergraduate audience, three decades later Burden and Faires remains the definitive introduction to a vital and practical subject. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Mathematics for Chemists

Contents - Preface - 1. REVIEW OF BASIC MATERIAL - FUNCTIONS, INEQUALITIES - 2. DIFFERENTIAL CALCULUS - 3. INTEGRATION - 4. FUNCTIONS OF MANY VARIABLES ; PARTIAL DIFFERENTIATION - 5. VECTORS - 6. SERIES, TAYLOR-MACLAURIN SERIES - 7. COMPLEX NUMBERS - 8. ORTHOGONAL FUNCTIONS AND FOURIER SERIES - 9. DETERMINANTS - 10. MATRICES - 11. DIFFERENTIAL EQUATIONS - 12. PARTIAL DIFFERENTIAL EQUATIONS - 13. NUMERICAL METHODS - 14. ELEMENTARY STATISTICS AND ERROR ANALYSIS - Problems for Solution - Bibliography - Answers to Problems - Index

Mathematical Analysis

Basic Mathematics for Economists

Routledge Economics students will welcome the new edition of this excellent textbook. Mathematics is an integral part of economics and understanding basic concepts is vital. Many students come into economics courses without having studied mathematics for a number of years. This clearly written book will help to develop quantitative skills in even the least numerate student up to the required level for a general Economics or Business Studies course. This second edition features new sections on subjects such as: matrix algebra part year investment financial mathematics Improved pedagogical features, such as learning objectives and end of chapter questions, along with the use of Microsoft Excel and the overall example-led style of the book means that it will be a sure fire hit with both students and their lecturers.

Complex Analysis with Applications

Springer This textbook is intended for a one semester course in complex analysis for upper level undergraduates in mathematics. Applications, primary motivations for this text, are presented hand-in-hand with theory enabling this text to serve well in courses for students in engineering or applied sciences. The overall aim in designing this text is to accommodate students of different mathematical backgrounds and to achieve a balance between presentations of rigorous mathematical proofs and applications. The text is adapted to enable maximum flexibility to instructors and to students who may also choose to progress through the material outside of coursework. Detailed examples may be covered in one course, giving the instructor the option to choose those that are best suited for discussion. Examples showcase a variety of problems with completely worked out solutions, assisting students in working through the exercises. The numerous exercises vary in difficulty from simple applications of formulas to more advanced project-type problems. Detailed hints accompany the more challenging problems. Multi-part exercises may be assigned to individual students, to groups as projects, or serve as further illustrations for the instructor. Widely used graphics clarify both concrete and abstract concepts, helping students visualize the proofs of many results. Freely accessible solutions to every-other-odd exercise are posted to the book's Springer website. Additional solutions for instructors' use may be obtained by contacting the authors directly.