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*Understanding Analysis* - Stephen Abbott 2012-12-06

This elementary presentation exposes readers to both the process of rigor and the rewards inherent in taking an axiomatic approach to the study of functions of a real variable. The aim is to challenge and improve mathematical intuition rather than to verify it. The philosophy of this book is to focus attention on questions which give analysis its inherent fascination. Each chapter begins with the discussion of some motivating examples and concludes with a series of questions.

**Mathematical Analysis** - Bernd S. W. Schröder 2008-01-28

A self-contained introduction to the fundamentals of mathematical analysis. *Mathematical Analysis: A Concise Introduction* presents the foundations of analysis and illustrates its role in mathematics. By focusing on the essentials, reinforcing learning through exercises, and featuring a unique "learn by doing" approach, the book develops the reader's proof writing skills and establishes fundamental comprehension of analysis that is essential for further exploration of pure and applied mathematics. This book is directly applicable to areas such as differential equations, probability theory, numerical analysis, differential geometry, and functional analysis. *Mathematical Analysis* is composed of three parts: Part One presents the analysis of functions of one variable, including sequences, continuity, differentiation, Riemann integration, series, and the Lebesgue integral. A detailed explanation of proof writing is provided with specific attention devoted to standard proof techniques. To facilitate an efficient transition to more abstract settings, the results for single variable functions are proved using methods that translate to metric spaces. Part Two explores the more abstract counterparts of the concepts outlined earlier in the text. The reader is introduced to the fundamental spaces of analysis, including  $L_p$  spaces, and the book successfully details how appropriate definitions of integration, continuity, and differentiation lead to a powerful and widely applicable foundation for further study of applied mathematics. The interrelation between measure theory, topology, and differentiation is then examined in the proof of the Multidimensional Substitution Formula. Further areas of coverage in this section include manifolds, Stokes' Theorem, Hilbert spaces, the convergence of Fourier series, and Riesz' Representation Theorem. Part Three provides an overview of the motivations for analysis as well as its applications in various subjects. A special focus on ordinary and partial differential equations presents some theoretical and practical challenges that exist in these areas. Topical coverage includes Navier-Stokes equations and the finite element method.

*Mathematical Analysis: A Concise Introduction* includes an extensive index and over 900 exercises ranging in level of difficulty, from conceptual questions and adaptations of proofs to proofs with and without hints. These opportunities for reinforcement, along with the overall concise and well-organized treatment of analysis, make this book essential for readers in upper-undergraduate or beginning graduate mathematics courses who would like to build a solid foundation in analysis for further work in all analysis-based branches of mathematics.

*Foundations of Mathematical Analysis* - Richard Johnsonbaugh 2012-09-11

Definitive look at modern analysis, with views of applications to statistics, numerical analysis, Fourier series, differential equations, mathematical analysis, and functional analysis. More than 750 exercises; some hints and solutions. 1981 edition.

*Elementary Classical Analysis* - Jerrold E. Marsden 1993-03-15

Designed for courses in advanced calculus and introductory real analysis, *Elementary Classical Analysis* strikes a careful balance between pure and applied mathematics with an emphasis on specific techniques important to classical analysis without vector calculus or complex analysis. Intended for students of engineering and physical science as well as of pure mathematics.

**Real Analysis** - N. L. Carothers 2000-08-15

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

*Calculus* - Tom M. Apostol 2019-04-26

An introduction to the Calculus, with an excellent balance between theory and technique. Integration is treated before differentiation--this is a departure from most modern texts, but it is historically correct, and it is the best way to establish the true connection between the integral and the derivative. Proofs of all the important theorems are given, generally preceded by geometric or intuitive discussion. This Second Edition introduces the mean-value theorems and their applications earlier in the text, incorporates a treatment of linear algebra, and contains many new and easier exercises. As in the first edition, an interesting historical introduction precedes each important new concept.

**Introduction to Calculus and Analysis II/1** - Richard Courant 1999-12-14

From the reviews: "...one of the best textbooks introducing several generations of mathematicians to higher mathematics. ... This excellent book is highly recommended both to instructors and students." --Acta Scientiarum Mathematicarum, 1991

*Mathematical Analysis* - Tom M. Apostol 2004

*Applied Analysis* - John K Hunter 2001-02-28

This book provides an introduction to those parts of analysis that are most useful in applications for graduate students. The material is selected for use in applied problems, and is presented clearly and simply but without sacrificing mathematical rigor. The text is accessible to students from a wide variety of backgrounds, including undergraduate students entering applied mathematics from non-mathematical fields and graduate students in the sciences and engineering who want to learn analysis. A basic background in calculus, linear algebra and ordinary differential equations, as well as some familiarity with functions and sets, should be sufficient.

**Analysis in Euclidean Space** - Kenneth Hoffman 2019-07-17

Developed for an introductory course in mathematical analysis at MIT, this text focuses on concepts, principles, and methods. Its introductions to real and complex analysis are closely formulated, and they constitute a natural introduction to complex function theory. Starting with an overview of the real number system, the text presents results for subsets and functions related to Euclidean space of  $n$  dimensions. It offers a rigorous review of the fundamentals of calculus, emphasizing power series expansions and introducing the theory of complex-analytic functions. Subsequent chapters cover sequences of functions, normed linear spaces, and the Lebesgue interval. They discuss most of the basic properties of integral and measure, including a brief look at orthogonal expansions. A chapter on differentiable mappings addresses implicit and inverse function theorems and the change of variable theorem. Exercises appear throughout the book, and extensive supplementary material includes a Bibliography, List of Symbols, Index, and an Appendix with background in elementary set theory.

**The Way of Analysis** - Robert S. Strichartz 2000

The Way of Analysis gives a thorough account of real analysis in one or several variables, from the construction of the real number system to an introduction of the Lebesgue integral. The text provides proofs of all main results, as well as motivations, examples, applications, exercises, and formal chapter summaries. Additionally, there are three chapters on application of analysis, ordinary differential equations, Fourier series, and curves and surfaces to show how the techniques of analysis are used in concrete settings.

**Implicit Functions and Solution Mappings** - Asen L. Dontchev 2014-06-18

The implicit function theorem is one of the most important theorems in analysis and its many variants are basic tools in partial differential equations and numerical analysis. This second edition of *Implicit Functions and Solution Mappings* presents an updated and more complete picture of the field by including solutions of problems that have been solved since the first edition was published, and places old and new results in a broader perspective. The purpose of this self-contained work is to provide a reference on the topic and to provide a unified collection of a number of results which are currently scattered throughout the literature. Updates to this edition include new sections in almost all chapters, new exercises and examples, updated commentaries to chapters and an enlarged index and references section.

*Foundations of Modern Analysis* - Avner Friedman 1982-01-01

Measure and integration, metric spaces, the elements of functional analysis in Banach spaces, and spectral theory in Hilbert spaces – all in a single study. Only book of its kind. Unusual topics, detailed analyses. Problems. Excellent for

first-year graduate students, almost any course on modern analysis. Preface. Bibliography. Index.

**New Horizons in Geometry** - Tom M. Apostol 2017-10-24

**Linear Algebra Done Right** - Sheldon Axler 1997-07-18

This text for a second course in linear algebra, aimed at math majors and graduates, adopts a novel approach by banishing determinants to the end of the book and focusing on understanding the structure of linear operators on vector spaces. The author has taken unusual care to motivate concepts and to simplify proofs. For example, the book presents - without having defined determinants - a clean proof that every linear operator on a finite-dimensional complex vector space has an eigenvalue. The book starts by discussing vector spaces, linear independence, span, basics, and dimension. Students are introduced to inner-product spaces in the first half of the book and shortly thereafter to the finite-dimensional spectral theorem. A variety of interesting exercises in each chapter helps students understand and manipulate the objects of linear algebra. This second edition features new chapters on diagonal matrices, on linear functionals and adjoints, and on the spectral theorem; some sections, such as those on self-adjoint and normal operators, have been entirely rewritten; and hundreds of minor improvements have been made throughout the text.

*Mathematical Analysis* - Andrew Browder 2012-12-06

Among the traditional purposes of such an introductory course is the training of a student in the conventions of pure mathematics: acquiring a feeling for what is considered a proof, and supplying literate written arguments to support mathematical propositions. To this extent, more than one proof is included for a theorem - where this is considered beneficial - so as to stimulate the students' reasoning for alternate approaches and ideas. The second half of this book, and consequently the second semester, covers differentiation and integration, as well as the connection between these concepts, as displayed in the general theorem of Stokes. Also included are some beautiful applications of this theory, such as Brouwer's fixed point theorem, and the Dirichlet principle for harmonic functions. Throughout, reference is made to earlier sections, so as to reinforce the main ideas by repetition. Unique in its applications to some topics not usually covered at this level.

Modern Real Analysis - William P. Ziemer 2017-11-30

This first year graduate text is a comprehensive resource in real analysis based on a modern treatment of measure and integration. Presented in a definitive and self-contained manner, it features a natural progression of concepts from simple to difficult. Several innovative topics are featured, including differentiation of measures, elements of Functional Analysis, the Riesz Representation Theorem, Schwartz distributions, the area formula, Sobolev functions and applications to harmonic functions. Together, the selection of topics forms a sound foundation in real analysis that is particularly suited to students going on to further study in partial differential equations. This second edition of *Modern Real Analysis* contains many substantial improvements, including the addition of problems for practicing techniques, and an entirely new section devoted to the relationship between Lebesgue and improper integrals. Aimed at graduate students with an understanding of advanced calculus, the text will also appeal to more experienced mathematicians as a useful reference.

**A Problem Book in Real Analysis** - Asuman G. Aksoy 2010-03-10

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.

Postmodern Analysis - Jürgen Jost 2013-03-09

What is the title of this book intended to signify, what connotations is the adjective "Postmodern" meant to carry? A potential reader will surely pose this question. To answer it, I should describe what distinguishes the approach to analysis presented here from what has been called "Modern Analysis" by its protagonists. "Modern Analysis" as represented in the works of the Bourbaki group or in the textbooks by Jean Dieudonné is characterized by its systematic and axiomatic treatment and by its drive towards a high level of abstraction. Given the tendency of many prior treatises on analysis to degenerate into a collection of rather unconnected tricks to solve special problems, this definitively represented a healthy achievement. In any case, for the development of a consistent and powerful mathematical theory, it seems to be necessary to concentrate solely on the internal problems and structures and to neglect the relations to other fields of scientific, even of mathematical study for a certain while. Almost complete isolation may be required to reach the level of intellectual elegance and perfection that only a good mathematical theory can acquire. However, once this level has been reached, it might be useful to open one's eyes again to the inspiration coming from concrete external problems.

**Complex Analysis** - Elias M. Stein 2010-04-22

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.

A Primer of Lebesgue Integration - H. S. Bear 2002

The Lebesgue integral is now standard for both applications and advanced mathematics. This book starts with a review of the familiar calculus integral and then constructs the Lebesgue integral from the ground up using the same ideas. A Primer of Lebesgue Integration has been used successfully both in the classroom and for individual study. Bear presents a clear and simple introduction for those intent on further study in higher mathematics. Additionally, this book serves as a refresher providing new insight for those in the field. The author writes with an engaging, commonsense style that appeals to readers at all levels.

**Analysis I** - Terence Tao 2016-08-29

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.

Calculus for Cranks - Nets Hawk Katz 2021-01-26

A new approach to the foundations of single variable calculus, based on the introductory course taught at Caltech in mathematics, "cranks" are people who insist they understand something new about math even when the world tells them they are doing it wrong. This introduction to calculus is written with those cranks in mind, based on the foundational course that Nets Katz teaches at Caltech. It emphasizes the practical purposes of the foundations, such as tracking errors in calculations. In addition to covering the basics of single variable calculus, the book outlines the mathematical method--the ability to express oneself with absolute precision and then to use logical proofs to establish that certain statements are universally true. Katz emphasizes conceptual clarity, as well as testing hypotheses and writing complete proofs. The result is a rigorous calculus book of use not only to future mathematicians but also to scientists and engineers.

**Advanced Calculus** - Lynn Harold Loomis 2014-02-26

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** - S. C. Malik 1992

The Book Is Intended To Serve As A Text In Analysis By The Honours And Post-Graduate Students Of The Various Universities. Professional Or Those Preparing For Competitive Examinations Will Also Find This Book Useful. The Book Discusses The Theory From Its Very Beginning. The Foundations Have Been Laid Very Carefully And The Treatment Is Rigorous And On Modern Lines. It Opens With A Brief Outline Of The Essential Properties Of Rational Numbers And Using Dedekind's Cut, The Properties Of Real Numbers Are Established. This Foundation Supports The Subsequent Chapters: Topological Framework Real Sequences And Series, Continuity Differentiation, Functions Of Several Variables, Elementary And Implicit Functions, Riemann And Riemann-Stieltjes Integrals, Lebesgue Integrals, Surface, Double And Triple Integrals Are Discussed In Detail. Uniform Convergence, Power Series, Fourier Series, Improper Integrals Have Been Presented In As Simple And Lucid Manner As Possible And Fairly Large Number Solved Examples To Illustrate Various Types Have Been Introduced. As Per Need, In The Present Set Up, A Chapter On Metric Spaces Discussing Completeness, Compactness And Connectedness Of The Spaces Has Been Added. Finally Two Appendices Discussing Beta-Gamma Functions, And Cantor's Theory Of Real Numbers Add Glory To The Contents Of The Book.

Functional Analysis - Elias M. Stein 2011-09-11

"This book covers such topics as  $L_p$  spaces, distributions, Baire category, probability theory and Brownian motion, several complex variables and oscillatory integrals in Fourier analysis. The authors focus on key results in each area, highlighting their importance and the organic unity of the subject"--Provided by publisher.

**Advanced Real Analysis** - Anthony W. Knap 2008-07-11

\* 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

Analysis On Manifolds - James R. Munkres 2018-02-19

A readable introduction to the subject of calculus on arbitrary surfaces or manifolds. Accessible to readers with knowledge of basic calculus and linear algebra. Sections include series of problems to reinforce concepts.

Introduction to Analytic Number Theory - Tom M. Apostol 2013-06-29

"This book is the first volume of a two-volume textbook for undergraduates and is indeed the crystallization of a course offered by the author at the California Institute of Technology to undergraduates without any previous knowledge of number theory. For this reason, the book starts with the most elementary properties of the natural integers. Nevertheless, the text succeeds in presenting an enormous amount of material in little more than 300 pages."--MATHEMATICAL REVIEWS  
Introduction to Real Analysis - Robert G. Bartle 1999-08-06

Functional Analysis, Sobolev Spaces and Partial Differential Equations - Haim Brezis 2010-11-02

This textbook is a completely revised, updated, and expanded English edition of the important *Analyse fonctionnelle* (1983). In addition, it contains a wealth of problems and exercises (with solutions) to guide the reader. Uniquely, this book presents in a coherent, concise and unified way the main results from functional analysis together with the main results from the theory of partial differential equations (PDEs). Although there are many books on functional analysis and many on PDEs, this is the first to cover both of these closely connected topics. Since the French book was first published, it has been translated into Spanish, Italian, Japanese, Korean, Romanian, Greek and Chinese. The English edition makes a welcome addition to this list.

Methods of Real Analysis - Richard R. Goldberg 2019-07-30

This is a textbook for a one-year course in analysis designed for students who have completed the ordinary course in elementary calculus.

Set Theory and Metric Spaces - Irving Kaplansky 2020-09-10

This is a book that could profitably be read by many graduate students or by seniors in strong major programs ... has a number of good features. There are many informal comments scattered between the formal development of theorems and these are done in a light and pleasant style. ... There is a complete proof of the equivalence of the axiom of choice, Zorn's Lemma, and well-ordering, as well as a discussion of the use of these concepts. There is also an interesting discussion of the continuum problem ... The presentation of metric spaces before topological spaces ... should be welcomed by most students, since metric spaces are much closer to the ideas of Euclidean spaces with which they are already familiar. --Canadian Mathematical Bulletin Kaplansky has a well-deserved reputation for his expository talents. The selection of topics is excellent. -- Lance Small, UC San Diego This book is based on notes from a course on set theory and metric spaces taught by Edwin Spanier, and also incorporates with his permission numerous exercises from those notes. The volume includes an Appendix that helps bridge the gap between metric and topological spaces, a Selected Bibliography, and an Index.

Mathematical Analysis I - Vladimir A. Zorich 2004-01-22

This work by Zorich on Mathematical Analysis constitutes a thorough first course in real analysis, leading from the most elementary facts about real numbers to such advanced topics as differential forms on manifolds, asymptotic methods, Fourier, Laplace, and Legendre transforms, and elliptic functions.

Introduction to Real Analysis - William F. Trench 2003

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.

*Advanced Calculus* - Patrick Fitzpatrick 2009

"Advanced Calculus is intended as a text for courses that furnish the backbone of the student's undergraduate education in mathematical analysis. The goal is to rigorously present the fundamental concepts within the context of illuminating examples and stimulating exercises. This book is self-contained and starts with the creation of basic tools using the completeness axiom. The continuity, differentiability, integrability, and power series representation properties of functions of a single variable are established. The next few chapters describe the topological and metric properties of Euclidean space. These are the basis of a rigorous treatment of differential calculus (including the Implicit Function Theorem and Lagrange Multipliers) for mappings between Euclidean spaces and integration for functions of several real variables."--pub. desc.

**Fundamental Mathematical Analysis** - Robert Magnus 2020-07-14

This textbook offers a comprehensive undergraduate course in real analysis in one variable. Taking the view that analysis can only be properly appreciated as a rigorous theory, the book recognises the difficulties that students experience when encountering this theory for the first time, carefully addressing them throughout. Historically, it was the precise description of real numbers and the correct definition of limit that placed analysis on a solid foundation. The book therefore begins with these crucial ideas and the fundamental notion of sequence. Infinite series are then introduced, followed by the key concept of continuity. These lay the groundwork for differential and integral calculus, which are carefully covered in the following chapters. Pointers for further study are included throughout the book, and for the more adventurous there is a selection of "nuggets", exciting topics not commonly discussed at this level. Examples of nuggets include Newton's method, the irrationality of  $\pi$ , Bernoulli numbers, and the Gamma function. Based on decades of teaching experience, this book is written with the undergraduate student in mind. A large number of exercises, many with hints, provide the practice necessary for learning, while the included "nuggets" provide opportunities to deepen understanding and broaden horizons.

**Real Analysis (Classic Version)** - Halsey Royden 2017-02-13

This text is designed for graduate-level courses in real analysis. Real Analysis, 4th Edition, covers the basic material that every graduate student should know in the classical theory of functions of a real variable, measure and integration theory, and some of the more important and elementary topics in general topology and normed linear space theory. This text assumes a general background in undergraduate mathematics and familiarity with the material covered in an undergraduate course on the fundamental concepts of analysis.

Real Analysis and Foundations, Fourth Edition - Steven G. Krantz 2016-12-12

A Readable yet Rigorous Approach to an Essential Part of Mathematical Thinking Back by popular demand, Real Analysis and Foundations, Third Edition bridges the gap between classic theoretical texts and less rigorous ones, providing a smooth transition from logic and proofs to real analysis. Along with the basic material, the text covers Riemann-Stieltjes integrals, Fourier analysis, metric spaces and applications, and differential equations. New to the Third Edition Offering a more streamlined presentation, this edition moves elementary number systems and set theory and logic to appendices and removes the material on wavelet theory, measure theory, differential forms, and the method of characteristics. It also adds a chapter on normed linear spaces and includes more examples and varying levels of exercises. Extensive Examples and Thorough Explanations Cultivate an In-Depth Understanding This best-selling book continues to give students a solid foundation in mathematical analysis and its applications. It prepares them for further exploration of measure theory, functional analysis, harmonic analysis, and beyond.

**Principles of Mathematical Analysis** - Walter Rudin 1976

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.