Zorich Mathematical Analysis

Was plane geometry your favourite math course in high school? Did you like proving theorems? Are you sick of memorising integrals? If so, real analysis could be your cup of tea. In contrast to calculus and elementary algebra, it involves neither formula manipulation nor applications to other fields of science. None. It is Pure Mathematics, and it is sure to appeal to the budding pure mathematician. In this new introduction to undergraduate real analysis the author takes a different approach from past studies of the subject, by stressing the importance of pictures in mathematics and hard problems. The exposition is informal and relaxed, with many helpful asides, examples and occasional comments from mathematicians like Dieudonne, Littlewood and Osserman. The author has taught the subject many times over the last 35 years at Berkeley and this book is based on the honours version of this course. The book contains an excellent selection of more than 500 exercises.

Topology continues to be a topic of prime importance in contemporary mathematics, but until the publication of this book there were few if any introductions to topology for undergraduates. This book remedied that need by offering a carefully thought-out, graduated approach to point set topology at the undergraduate level. To make the book as accessible as possible, the author approaches topology from a geometric and axiomatic standpoint; geometric, because most students come to the subject with a good deal of geometry behind them, enabling them to use their geometric intuition; axiomatic, because it parallels the student's experience with modern algebra, and keeps the book in harmony with current trends in mathematics. After a discussion of such preliminary topics as the algebra of sets, Euler-Venn diagrams and infinite sets, the author takes up basic definitions and theorems regarding topological spaces (Chapter 1). The second chapter deals with continuous functions (mappings) and homeomorphisms, followed by two chapters on special types of topological spaces (varieties of compactness and varieties of connectedness). Chapter 5 covers metric spaces. Since basic point set topology serves as a foundation not only for functional analysis but also for more advanced work in point set topology and algebraic topology, the author has included topics aimed at students with interests other than analysis. Moreover, Dr. Baum has supplied quite detailed proofs in the beginning to help students approaching this type of axiomatic mathematics for the first time. Similarly, in the first part of the book problems are elementary, but they become progressively more difficult toward the end of the book. References have been supplied to suggest further reading to the interested student.

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 ?, 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. Approach your problems from the right end It isn't that they can't see the solution. It is and begin with the answers. Then one day, tbat they can't see the problem. perbaps you will find the fina\ question. G. K. Chesterton. The Scandal of Father 'The Hermit Clad in Crane Feathers' in R. Brown 'The point of a Pin'. van GuJik's The Chinese Maze Murders. Growing specialization and diversification have brought a host of monographs and textbooks on increasingly specialized topics. However, the "tree" of knowledge of mathematics and related fields does not grow only by putting forth new branches. It also happens, quite often in fact, that branches which were thought to be completely disparate are suddenly seen to be related. Further, the kind and level of sophistication of mathematics applied in various sciences has changed drastically in recent years: measure theory is used (non-trivially) in regional and theoretical economics; algebraic geometry interacts with physics; the Minkowsky lemma, coding theory and the structure of water meet one another in packing and covering theory; quantum fields, crystal defects and mathematical programming profit from homotopy theory; Lie algebras are relevant to filtering; and prediction and electrical engineering can use Stein spaces. And in addition to this there are such newemerging subdisciplines as "experimental mathematics", "CFD", "completely integrable systems", "chaos, synergetics and large-scale order", which are almost impossible to fit into the existing classification schemes. They draw upon widely different sections of mathematics.

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.
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.
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.
There are many mathematics textbooks on real analysis, but they focus on topics not readily helpful for studying economic theory or they are inaccessible to most graduate students of economics. Real Analysis with Economic Applications aims to fill this gap by providing an ideal textbook and reference on real analysis tailored specifically to the concerns of such students. The emphasis throughout is on topics directly relevant to economic theory. In addition to addressing the usual topics of real analysis, this book discusses the elements of order theory, convex analysis, optimization, correspondences, linear and nonlinear functional analysis, fixed-point theory, dynamic programming, and calculus of variations. Efe Ok complements the mathematical development with applications that provide concise introductions to various topics from economic theory, including individual decision theory and games, welfare economics, information theory, general equilibrium and finance, and intertemporal economics. Moreover, apart from direct applications to economic theory, his book includes numerous fixed point theorems and applications to functional equations and optimization theory. The book is rigorous, but accessible to those who are relatively new to the ways of real analysis. The formal exposition is accompanied by discussions that describe the basic ideas in relatively heuristic terms, and by more than 1,000 exercises of varying difficulty. This book will be an indispensable resource in courses on mathematics for economists and as a reference for graduate students working on economic theory.
Real Analysis is the third volume in the Princeton Lectures in Analysis, a series of four textbooks that aim to present, in an integrated manner, the core areas of analysis. Here the focus is on the development of measure and integration theory, differentiation and integration, Hilbert spaces, and Hausdorff measure and fractals. This book reflects the objective of the series as a whole: to make plain the organic unity that exists between the various parts of the subject, and to illustrate the wide applicability of ideas of analysis to other fields of mathematics and science. After setting forth the basic facts of measure theory, Lebesgue integration, and differentiation on Euclidian spaces, the authors move to the elements of Hilbert space, via the L2 theory. They next present basic illustrations of these concepts from Fourier analysis, partial differential equations, and complex analysis. The final part of the book introduces the reader to the fascinating subject of fractional-dimensional sets, including Hausdorff measure, self-replicating sets, space-filling curves, and Besicovitch sets. Each chapter has a series of exercises,

from the relatively easy to the more complex, that are tied directly to the text. A substantial number of hints encourage the reader to take on even the more challenging exercises. As with the other volumes in the series, Real Analysis is accessible to students interested in such diverse disciplines as mathematics, physics, engineering, and finance, at both the undergraduate and graduate levels. Also available, the first two volumes in the Princeton Lectures in Analysis:

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.

This book takes the reader on a journey through the world of college mathematics, focusing on some of the most important concepts and results in the theories of polynomials, linear algebra, real analysis, differential equations, coordinate geometry, trigonometry, elementary number theory, combinatorics, and probability. Preliminary material provides an overview of common methods of proof: argument by contradiction, mathematical induction, pigeonhole principle, ordered sets, and invariants. Each chapter systematically presents a single subject within which problems are clustered in each section according to the specific topic. The exposition is driven by nearly 1300 problems and examples chosen from numerous sources from around the world; many original contributions come from the authors. The source, author, and historical background are cited whenever possible. Complete solutions to all problems are given at the end of the book. This second edition includes new sections on quad ratic polynomials, curves in the plane, quadratic fields, combinatorics of numbers, and graph theory, and added problems or theoretical expansion of sections on polynomials, matrices, abstract algebra, limits of sequences and functions, derivatives and their applications, Stokes' theorem, analytical geometry, combinatorial geometry, and counting strategies. Using the W.L. Putnam Mathematical Competition for undergraduates as an inspiring symbol to build an appropriate math background for graduate studies in pure or applied mathematics, the reader is eased into transitioning from problem-solving at the high school level to the university and beyond, that is, to mathematical research. This work may be used as a study guide for the Putnam exam,

as a text for many different problem-solving courses, and as a source of problems for standard courses in undergraduate mathematics. Putnam and Beyond is organized for independent study by undergraduate and gradu ate students, as well as teachers and researchers in the physical sciences who wish to expand their mathematical horizons.
This is a relatively fast paced graduate level introduction to complex algebraic geometry, from the basics to the frontier of the subject. It covers sheaf theory, cohomology, some Hodge theory, as well as some of the more algebraic aspects of algebraic geometry. The author frequently refers the reader if the treatment of a certain topic is readily available elsewhere but goes into considerable detail on topics for which his treatment puts a twist or a more transparent viewpoint. His cases of exploration and are chosen very carefully and deliberately. The textbook achieves its purpose of taking new students of complex algebraic geometry through this a deep yet broad introduction to a vast subject, eventually bringing them to the forefront of the topic via a non-intimidating style.
These notes developed from a course on the numerical solution of conservation laws first taught at the University of Washington in the fall of 1988 and then at ETH during the following spring. The overall emphasis is on studying the mathematical tools that are essential in de veloping, analyzing, and successfully using numerical methods for nonlinear systems of conservation laws, particularly for problems involving shock waves. A reasonable un derstanding of the mathematical structure of these equations and their solutions is first required, and Part I of these notes deals with this theory. Part II deals more directly with numerical methods, again with the emphasis on general tools that are of broad use. I have stressed the underlying ideas used in various classes of methods rather than present ing the most sophisticated methods in great detail. My aim was to provide a sufficient background that students could then approach the current research literature with the necessary tools and understanding. vVithout the wonders of TeX and LaTeX, these notes would never have been put together. The professional-looking results perhaps obscure the fact that these are indeed lecture notes. Some sections have been reworked several times by now, but others are still preliminary. I can only hope that the errors are not too blatant. Moreover, the breadth and depth of coverage was limited by the length of these courses, and some parts are rather sketchy.
The second volume expounds classical analysis as it is today, as a part of unified mathematics, and its interactions with modern mathematical courses such as algebra, differential geometry, differential equations, complex and functional analysis. The book provides a firm foundation for advanced work in any of these directions.
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 Modem Lines. It Opens With A Brief Outline Of The Essential Properties Of Rational Numbers And Using Dedekinds Cut, The Properties Of Real Numbers Are Established. This Foundation Supports The Subsequent Chapters: Topological Frame Work 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 Cantors Theory Of Real Numbers Add Glory To The Contents Of The Book.

Mathematical Analysis ISpringer Science & Business Media

Classic, widely cited, and accessible treatment offers an ideal supplement to many traditional linear algebra texts. "Extremely well-written and logical, with short and elegant proofs." — MAA Reviews. 1958 edition.

This textbook, written by a dedicated and successful pedagogue who developed the present undergraduate algebra course at Moscow State University, differs in several respects from other algebra textbooks available in English. The book reflects the Soviet approach to teaching mathematics with its emphasis on applications and problem-solving -- note that the mathematics department in Moscow is called the I~echanics-Mathematics" Faculty. In the first place, Kostrikin's textbook motivates many of the algebraic concepts by practical examples, for instance, the heated plate problem used to introduce linear equations in Chapter 1. In the second place, there are a large number of exercises, so that the student can convert a vague passive understanding to active mastery of the new ideas. Thes~ problems are intended to be challenging but doable by the student; the harder ones have hints at the back of the book. This feature also makes the book ideally suited for learning algebra on one's own outside of the framework of an organized course. In the third place, the author treats material which is usually not part of an elementary course but which is fundamental in applications. Thus, Part II includes an introduction to the classical groups and to representation theory. With many American colleges now trying to bring their undergraduate mathematics curriculum closer to applications, it seems worthwhile to translate Soviet textbooks which reflect their greater experience in this area of mathematical pedagogy.

This book is an introduction to mathematical analysis (i.e real analysis) at a fairly elementary level. A great (unusual) emphasis is given to the construction of rational and then of real numbers, using the method of equivalence classes and of Cauchy sequences. The text includes the usual presentation of: sequences of real numbers, infinite numerical series, continuous functions, derivatives and Riemann-Darboux integration. There are also two “special” sections: on convex functions and on metric spaces, as well as an elementary appendix on Logic, Set Theory and Functions. We insist on a rigorous presentation throughout in the framework of the classical, standard, analysis. Contents: NumbersSequences of Real NumbersInfinite Numerical SeriesContinuous FunctionsDerivativesConvex FunctionsMetric SpacesIntegrationIndexIndex of NotationsAppendix (Logic, Set Theory and Functions)Bibliography Readership: Undergraduate students of calculus and real analysis. keywords:Numbers;Sequences;Series;Continuous Functions;Derivatives;Convex Functions;Metric Spaces;Integration

This text is a rigorous, detailed introduction to real analysis that presents the fundamentals with clear exposition and carefully written definitions, theorems, and proofs. It is organized in a distinctive, flexible way that would make it equally appropriate to undergraduate mathematics majors who want to continue in mathematics, and to future mathematics teachers who want to understand the theory behind calculus. The Real Numbers and Real Analysis will serve as an excellent one-semester text for undergraduates majoring in mathematics, and for students in mathematics education who want a thorough understanding of the theory behind the real number system and calculus.

Based on a two-semester course aimed at illustrating various interactions of "pure mathematics" with other sciences, such as hydrodynamics, thermodynamics, statistical physics and information theory, this text unifies three general topics of analysis and physics, which are as follows: the dimensional analysis of physical quantities, which contains various applications including Kolmogorov's model for turbulence; functions of very large number of variables and the principle of concentration along with the non-linear law of large numbers, the geometric meaning of the Gauss and Maxwell distributions, and the Kotelnikov-Shannon theorem; and, finally, classical thermodynamics and contact geometry, which covers two main principles of thermodynamics in the language of differential forms, contact distributions, the Frobenius theorem and the Carnot-Caratheodory metric. It includes problems, historical remarks, and Zorich's popular article, "Mathematics as language and method."

Translated from the Russian by E.J.F. Primrose "Remarkable little book." -SIAM REVIEW V.I. Arnold, who is renowned for his lively style, retraces the beginnings of mathematical analysis and theoretical physics in the works (and the intrigues!) of the great scientists of the 17th century. Some of Huygens' and Newton's ideas. several centuries ahead of their time, were developed only recently. The author follows the link between their inception and the breakthroughs in contemporary mathematics and physics. The book provides present-day generalizations of Newton's theorems on the elliptical shape of orbits and on the transcendence of abelian integrals; it offers a brief review of the theory of regular and chaotic movement in celestial mechanics, including the problem of ports in the distribution of smaller planets and a discussion of the structure of planetary rings.

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.

This second edition of a very popular two-volume work presents a thorough first course in analysis, leading from real numbers to such advanced topics as differential forms on manifolds; asymptotic methods; Fourier, Laplace, and Legendre transforms; elliptic functions; and distributions. Especially notable in this course are the clearly expressed orientation toward the natural sciences and the informal exploration of the essence and the roots of the basic concepts and theorems of calculus. Clarity of exposition is matched by a wealth of instructive exercises, problems, and fresh applications to areas seldom touched on in textbooks on real analysis. The main difference between the second and first editions is the addition of a series of appendices to each volume. There are six of them in the first volume and five in the second. The subjects of these appendices

are diverse. They are meant to be useful to both students (in mathematics and physics) and teachers, who may be motivated by different goals. Some of the appendices are surveys, both prospective and retrospective. The final survey establishes important conceptual connections between analysis and other parts of mathematics. The first volume constitutes a complete course in one-variable calculus along with the multivariable differential calculus elucidated in an up-to-date, clear manner, with a pleasant geometric and natural sciences flavor.
Written for junior and senior undergraduates, this remarkably clear and accessible treatment covers set theory, the real number system, metric spaces, continuous functions, Riemann integration, multiple integrals, and more. 1968 edition.
The Fundamentals of Mathematical Analysis, Volume 1 is a textbook that provides a systematic and rigorous treatment of the fundamentals of mathematical analysis. Emphasis is placed on the concept of limit which plays a principal role in mathematical analysis. Examples of the application of mathematical analysis to geometry, mechanics, physics, and engineering are given. This volume is comprised of 14 chapters and begins with a discussion on real numbers, their properties and applications, and arithmetical operations over real numbers. The reader is then introduced to the concept of function, important classes of functions, and functions of one variable; the theory of limits and the limit of a function, monotonic functions, and the principle of convergence; and continuous functions of one variable. A systematic account of the differential and integral calculus is then presented, paying particular attention to differentiation of functions of one variable; investigation of the behavior of functions by means of derivatives; functions of several variables; and differentiation of functions of several variables. The remaining chapters focus on the concept of a primitive function (and of an indefinite integral); definite integral; geometric applications of integral and differential calculus. This book is intended for first- and second-year mathematics students.
"This textbook provides an outstanding introduction to analysis. It is distinguished by its high level of presentation and its focus on the essential." (Zeitschrift für Analysis und ihre Anwendung 18, No. 4 - G. Berger, review of the first German edition) "One advantage of this presentation is that the power of the abstract concepts are convincingly demonstrated using concrete applications." (W. Grölz, review of the first German edition)
Multivariable Mathematics combines linear algebra and multivariable mathematics in a rigorous approach. The material is integrated to emphasize the recurring theme of implicit versus explicit that persists in linear algebra and analysis. In the text, the author includes all of the standard computational material found in the usual linear algebra and multivariable calculus courses, and more, interweaving the material as effectively as possible, and also includes complete proofs. * Contains plenty of examples, clear proofs, and significant motivation for the crucial concepts. * Numerous exercises of varying levels of

difficulty, both computational and more proof-oriented. * Exercises are arranged in order of increasing difficulty.
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.
This new, revised edition covers all of the basic topics in calculus of several variables, including vectors, curves, functions of several variables, gradient, tangent plane, maxima and minima, potential functions, curve integrals, Green’s theorem, multiple integrals, surface integrals, Stokes’ theorem, and the inverse mapping theorem and its consequences. It includes many completely worked-out problems.
This book gives an elementary treatment of the basic material about graph spectra, both for ordinary, and Laplace and Seidel spectra. The text progresses systematically, by covering standard topics before presenting some new material on trees, strongly regular graphs, two-graphs, association schemes, p-ranks of configurations and similar topics. Exercises at the end of each chapter provide practice and vary from easy yet interesting applications of the treated theory, to little excursions into related topics. Tables, references at the end of the book, an author and subject index enrich the text. Spectra of Graphs is written for researchers, teachers and graduate students interested in graph spectra. The reader is assumed to be familiar with basic linear algebra and eigenvalues, although some more advanced topics in linear algebra, like the Perron-Frobenius theorem and eigenvalue interlacing are included.
"The three volumes of A Course in Mathematical Analysis provide a full and detailed account of all those elements of real and complex analysis that an undergraduate mathematics student can expect to encounter in their first two or three years of study. Containing hundreds of exercises, examples and applications, these books will become an invaluable resource for both students and instructors. Volume I focuses on the analysis of real-valued functions of a real variable. Besides developing the basic theoryit describes many applications, including a chapter on Fourier series. It also includes a Prologue in which the author introduces the axioms of set theory and uses them to construct the real number system. Volume II goes on to consider metric and topological spaces, and functions of several variables. Volume III covers complex analysis and the theory of measure and integration"--
The purpose of this textbook is to present an array of topics in Calculus, and conceptually follow our previous effort Mathematical Analysis I.The present material is partly found, in fact, in the syllabus of the typical second lecture course in Calculus as offered in most Italian universities. While the subject matter known as `Calculus 1' is more or less standard, and concerns real functions of real variables, the topics of a course on `Calculus 2'can vary a lot, resulting in a bigger flexibility. For these reasons the Authors tried to cover a wide range of subjects, not forgetting that the number of credits the current programme specifications confers to a second Calculus course is not comparable to the amount of content gathered here. The reminders disseminated in the

text make the chapters more independent from one another, allowing the reader to jump back and forth, and thus enhancing the versatility of the book. On the website: http://calvino.polito.it/canuto-tabacco/analisi 2, the interested reader may find the rigorous explanation of the results that are merely stated without proof in the book, together with useful additional material. The Authors have completely omitted the proofs whose technical aspects prevail over the fundamental notions and ideas. The large number of exercises gathered according to the main topics at the end of each chapter should help the student put his improvements to the test. The solution to all exercises is provided, and very often the procedure for solving is outlined.

The purpose of the volume is to provide a support for a first course in Mathematics. The contents are organised to appeal especially to Engineering, Physics and Computer Science students, all areas in which mathematical tools play a crucial role. Basic notions and methods of differential and integral calculus for functions of one real variable are presented in a manner that elicits critical reading and prompts a hands-on approach to concrete applications. The layout has a specifically-designed modular nature, allowing the instructor to make flexible didactical choices when planning an introductory lecture course. The book may in fact be employed at three levels of depth. At the elementary level the student is supposed to grasp the very essential ideas and familiarise with the corresponding key techniques. Proofs to the main results befit the intermediate level, together with several remarks and complementary notes enhancing the treatise. The last, and farthest-reaching, level requires the additional study of the material contained in the appendices, which enable the strongly motivated reader to explore further into the subject. Definitions and properties are furnished with substantial examples to stimulate the learning process. Over 350 solved exercises complete the text, at least half of which guide the reader to the solution. This new edition features additional material with the aim of matching the widest range of educational choices for a first course of Mathematics.

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.