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Complex Analysis

A First Course In Chaotic Dynamical Systems
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A First Course in Complex Analysis

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A First Course in Complex Analysis with Applications Jones & Bartlett Publishers
A First Course in Complex Analysis with ApplicationsJones & Bartlett Learning
Visual Complex Analysis Springer
Ideal for a first course in complex analysis, this book can be used either as a classroom text or for independent study. Written at a level accessible to advanced undergraduates and beginning graduate students, the book is suitable for readers acquainted with advanced calculus or introductory real analysis. The treatment goes beyond the standard material of power series, Cauchy's theorem, residues, conformal mapping, and harmonic functions by including

accessible discussions of intriguing topics that are uncommon in a book at this level. The flexibility afforded by the supplementary topics and applications makes the book adaptable either to a short, one-term course or to a comprehensive, full-year course. Detailed solutions of the exercises both serve as models for students and facilitate independent study. Supplementary exercises, not solved in the book, provide an additional teaching tool.

Functions of One Complex Variable OUP Oxford

An introduction to dimensional analysis, a method of scientific analysis used to investigate and simplify complex physical phenomena, demonstrated through a series of engaging examples. This book offers an introduction to dimensional analysis, a powerful method of scientific analysis used to investigate and simplify complex physical phenomena. The method enables bold approximations and the generation of testable hypotheses. The book explains these analyses through a series of entertaining applications; students will learn to analyze, for example, the limits of world-record weight lifters, the distance an electric submarine can travel, how an upside-down pendulum is similar to a running velociraptor, and the number of Olympic rowers required to double boat speed. The book introduces the approach through easy-to-follow, step-by-step methods that show how to identify the essential variables describing a complex problem; explore

the dimensions of the problem and recast it to reduce complexity; leverage physical insights and experimental observations to further reduce complexity; form testable scientific hypotheses; combine experiments and analysis to solve a problem; and collapse and present experimental measurements in a compact form. Each chapter ends with a summary and problems for students to solve. Taken together, the analyses and examples demonstrate the value of dimensional analysis and provide guidance on how to combine and enhance dimensional analysis with physical insights. The book can be used by undergraduate students in physics, engineering, chemistry, biology, sports science, and astronomy.

A Complex Analysis Problem Book McGraw Hill Professional

A First Course In Complex Analysis With Applications Limits Theoretical Coverage To Only What Is Necessary, And Conveys It In A Student-Friendly Style. Its Aim Is To Introduce The Basic Principles And Applications Of Complex Analysis To Undergraduates Who Have No Prior Knowledge Of This Subject. Contents Of The Book Include The Complex Number System, Complex Functions And Sequences, As Well As Real Integrals; In Addition To Other Concepts Of Calculus, And The Functions Of A Complex Variable. This Text Is Written For Junior-Level Undergraduate Students Who Are Majoring In Math, Physics, Computer Science, And Electrical Engineering.

A First Course in Partial Differential Equations Jones & Bartlett Learning

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.

Complex Analysis with Applications CRC Press

A First Course in Complex Analysis was developed from lecture notes for a one-semester undergraduate course taught by the authors. For many students, complex analysis is the first rigorous analysis (if not mathematics) class they take, and these notes reflect this. The authors try to rely on as few concepts from real analysis as possible. In particular, series and sequences are treated from scratch.

Complex Made Simple Birkhäuser

A First Course in Chaotic Dynamical Systems: Theory and Experiment is the first book to introduce modern topics in dynamical systems at the undergraduate level. Accessible to readers with only a background in calculus, the book integrates both theory and computer experiments into its coverage of contemporary ideas in dynamics. It is designed as a gradual introduction to the basic mathematical ideas behind such topics as chaos, fractals, Newton's method, symbolic dynamics, the Julia set, and the Mandelbrot set, and includes biographies of some of the leading researchers in the field of

dynamical systems. Mathematical and computer experiments are integrated throughout the text to help illustrate the meaning of the theorems presented. Chaotic Dynamical Systems Software, Labs 1-6 is a supplementary labouratory software package, available separately, that allows a more intuitive understanding of the mathematics behind dynamical systems theory. Combined with A First Course in Chaotic Dynamical Systems , it leads to a rich understanding of this emerging field.

A First Course in Network Science American Mathematical Soc.

Suitable for advanced undergraduate and graduate students, this text presents the general properties of partial differential equations, including the elementary theory of complex variables. Solutions. 1965 edition.

Complex Analysis SIAM

An introductory course in complex analysis for incoming graduate students. Created to teach Math 5283 at Oklahoma State University. The book has somewhat more material than could fit in a one-semester course, allowing some choices. There are also appendices on metric spaces and some basic analysis background to make for a longer and more complete course for those that have only had an introduction to basic analysis on the real line.

A First Course In Complex Analysis, 2/E Oxford University Press

This book is based on a first-year graduate course I gave three times at the University of Chicago. As it was addressed to graduate students who

intended to specialize in mathematics, I tried to put the classical theory of functions of a complex variable in context, presenting proofs and points of view which relate the subject to other branches of mathematics. Complex analysis in one variable is ideally suited to this attempt. Of course, the branches of mathema tics one chooses, and the connections one makes, must depend on personal taste and knowledge. My own leaning towards several complex variables will be apparent, especially in the notes at the end of the different chapters. The first three chapters deal largely with classical material which is avai lable in the many books on the subject. I have tried to present this material as efficiently as I could, and, even here, to show the relationship with other branches of mathematics. Chapter 4 contains a proof of Picard's theorem; the method of proof I have chosen has far-reaching generalizations in several complex variables and in differential geometry. The next two chapters deal with the Runge approximation theorem and its many applications. The presentation here has been strongly influenced by work on several complex variables.

Complex Variables and Analytic Functions: An Illustrated Introduction

Springer Science & Business Media

A First Course in Complex Analysis was developed from lecture notes for a one-semester undergraduate course taught by the authors. For many students, complex analysis is the first rigorous analysis (if not mathematics) class they

take, and these notes reflect this. The authors try to rely on as few concepts from real analysis as possible. In particular, series and sequences are treated from scratch.

A First Course in Quantitative Finance Princeton University Press

The present book is meant as a text for a course on complex analysis at the advanced undergraduate level, or first-year graduate level. Somewhat more material has been included than can be covered at leisure in one term, to give opportunities for the instructor to exercise his taste, and lead the course in whatever direction strikes his fancy at the time. A large number of routine exercises are included for the more standard portions, and a few harder exercises of striking theoretical interest are also included, but may be omitted in courses addressed to less advanced students. In some sense, I think the classical German prewar texts were the best (Hurwitz-Courant, Knopp, Bieberbach, etc.) and I would recom mend to anyone to look through them. More recent texts have empha sized connections with real analysis, which is important, but at the cost of exhibiting succinctly and clearly what is peculiar about complex anal ysis: the power series expansion, the uniqueness of analytic continuation, and the calculus of residues. The systematic elementary development of formal and convergent power series was standard fare in the German texts, but only Cartan, in the more recent books, includes this material, which I think is quite essential,

e. g. , for differential equations. I have written a short text, exhibiting these features, making it applicable to a wide variety of tastes. The book essentially decomposes into two parts.

Complex Analysis Courier Corporation

This rigorous textbook is intended for a year-long analysis or advanced calculus course for advanced undergraduate or beginning graduate students. Starting with detailed, slow-paced proofs that allow students to acquire facility in reading and writing proofs, it clearly and concisely explains the basics of differentiation and integration of functions of one and several variables, and covers the theorems of Green, Gauss, and Stokes. Minimal prerequisites are assumed, and relevant linear algebra topics are reviewed right before they are needed, making the material accessible to students from diverse backgrounds. Abstract topics are preceded by concrete examples to facilitate understanding, for example, before introducing differential forms, the text examines low-dimensional examples. The meaning and importance of results are thoroughly discussed, and numerous exercises of varying difficulty give students ample opportunity to test and improve their knowledge of this difficult yet vital subject.

Schaum's Outline of Complex Variables, 2ed Cambridge University Press

Complex analysis is a classic and central area of mathematics, which is studied and exploited in a range of important fields, from number theory to

engineering. Introduction to Complex Analysis was first published in 1985, and for this much awaited second edition the text has been considerably expanded, while retaining the style of the original. More detailed presentation is given of elementary topics, to reflect the knowledge base of current students. Exercise sets have been substantially revised and enlarged, with carefully graded exercises at the end of each chapter. This is the latest addition to the growing list of Oxford undergraduate textbooks in mathematics, which includes: Biggs: Discrete Mathematics 2nd Edition, Cameron: Introduction to Algebra, Needham: Visual Complex Analysis, Kaye and Wilson: Linear Algebra, Acheson: Elementary Fluid Dynamics, Jordan and Smith: Nonlinear Ordinary Differential Equations, Smith: Numerical Solution of Partial Differential Equations, Wilson: Graphs, Colourings and the Four-Colour Theorem, Bishop: Neural Networks for Pattern Recognition, Gelman and Nolan: Teaching Statistics.

Function Theory of One Complex Variable Cambridge University Press

Complex analysis is one of the most central subjects in mathematics. It is compelling and rich in its own right, but it is also remarkably useful in a wide variety of other mathematical subjects, both pure and applied. This book is different from others in that it treats complex variables as a direct development from multivariable real calculus. As each new idea is introduced, it is related to the corresponding idea from real analysis and calculus. The text

is rich with examples and exercises that illustrate this point. The authors have systematically separated the analysis from the topology, as can be seen in their proof of the Cauchy theorem. The book concludes with several chapters on special topics, including full treatments of special functions, the prime number theorem, and the Bergman kernel. The authors also treat H^p spaces and Painleve's theorem on smoothness to the boundary for conformal maps. This book is a text for a first-year graduate course in complex analysis. It is an engaging and modern introduction to the subject, reflecting the authors' expertise both as mathematicians and as expositors.

A First Course in Analysis Orthogonal Publishing L3c

At its core, this concise textbook presents standard material for a first course in complex analysis at the advanced undergraduate level. This distinctive text will prove most rewarding for students who have a genuine passion for mathematics as well as certain mathematical maturity. Primarily aimed at undergraduates with working knowledge of real analysis and metric spaces, this book can also be used to instruct a graduate course. The text uses a conversational style with topics purposefully apportioned into 21 lectures, providing a suitable format for either independent study or lecture-based teaching. Instructors are invited to rearrange the order of topics according to their own vision. A clear and rigorous exposition is supported by engaging

examples and exercises unique to each lecture; a large number of exercises contain useful calculation problems. Hints are given for a selection of the more difficult exercises. This text furnishes the reader with a means of learning complex analysis as well as a subtle introduction to careful mathematical reasoning. To guarantee a student's progression, more advanced topics are spread out over several lectures. This text is based on a one-semester (12 week) undergraduate course in complex analysis that the author has taught at the Australian National University for over twenty years. Most of the principal facts are deduced from Cauchy's Independence of Homotopy Theorem allowing us to obtain a clean derivation of Cauchy's Integral Theorem and Cauchy's Integral Formula. Setting the tone for the entire book, the material begins with a proof of the Fundamental Theorem of Algebra to demonstrate the power of complex numbers and concludes with a proof of another major milestone, the Riemann Mapping Theorem, which is rarely part of a one-semester undergraduate course.

Invitation to Complex Analysis

Springer Science & Business Media

Using stereoscopic images and other novel pedagogical features, this book offers a comprehensive introduction to quantitative finance.

Elementary Theory of Analytic Functions of One or Several Complex Variables

Springer

Recent decades have seen profound changes in the way we understand

complex analysis. This new work presents a much-needed modern treatment of the subject, incorporating the latest developments and providing a rigorous yet accessible introduction to the concepts and proofs of this fundamental branch of mathematics. With its thorough review of the prerequisites and well-balanced mix of theory and practice, this book will appeal both to readers interested in pursuing advanced topics as well as those wishing to explore the many applications of complex analysis to engineering and the physical sciences. * Reviews the necessary calculus, bringing readers quickly up to speed on the material * Illustrates the theory, techniques, and reasoning through the use of short proofs and many examples * Demystifies complex versus real differentiability for functions from the plane to the plane * Develops Cauchy's Theorem, presenting the powerful and easy-to-use winding-number version * Contains over 100 sophisticated graphics to provide helpful examples and reinforce important concepts

A Friendly Approach to Complex Analysis Jones & Bartlett Learning

The book constitutes a basic, concise, yet rigorous course in complex analysis, for students who have studied calculus in one and several variables, but have not previously been exposed to complex analysis. The textbook should be particularly useful and relevant for undergraduate students in joint programmes with mathematics, as well as engineering students. The aim of the

book is to cover the bare bones of the subject with minimal prerequisites. The core content of the book is the three main pillars of complex analysis: the Cauchy–Riemann equations, the Cauchy Integral Theorem, and Taylor and Laurent series expansions. Each section contains several problems, which are not purely drill exercises, but are rather meant to reinforce the fundamental concepts. Detailed solutions to all the exercises appear at the end of the book, making the book ideal also for self-study. There are many figures illustrating the text. Errata(s) Errata (72 KB)
Complex Analysis in one Variable John Wiley & Sons
Designed for the undergraduate student with a calculus background but no prior experience with complex analysis, this text discusses the theory of the most relevant mathematical topics in a student-friendly manner. With a clear and straightforward writing style, concepts are introduced through numerous examples, illustrations, and applications. Each section of the text contains an extensive exercise set containing a range of computational, conceptual, and geometric problems. In the text and exercises, students are guided and supported through numerous proofs providing them with a higher level of mathematical insight and maturity. Each chapter contains a separate section devoted exclusively to the applications of complex analysis to science and engineering, providing students with the opportunity to develop a practical and clear understanding of complex analysis.

The Mathematica syntax from the second edition has been updated to coincide with version 8 of the software. --