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From the reviews: "... In sum, the volume under review is the first quarter of an important work that surveys an active branch of modern mathematics. Some of the individual articles are reminiscent in style of the early volumes of the first Ergebnisse series and will probably prove to be equally useful as a reference; ...for the appropriate reader, they will be valuable sources of information about modern complex analysis." Bulletin of the Am.Math.Society, 1991 "... This remarkable book has a helpfully informal style, abundant motivation, outlined proofs followed by precise references, and an extensive bibliography; it will be an invaluable reference and a companion to modern courses on several complex variables." ZAMP, Zeitschrift für Angewandte Mathematik und Physik, 1990 This book provides a systematic introduction to functions of one complex variable. Its novel feature is the consistent use of special color representations – so-called phase portraits – which visualize functions as images on their domains. Reading Visual Complex Functions requires no prerequisites except some basic knowledge of real calculus and plane geometry. The text is self-contained and covers all the main topics usually treated in a first course on complex analysis. With separate chapters on various construction principles, conformal mappings and Riemann surfaces it goes somewhat beyond a standard programme and leads the reader to more advanced themes. In a second storyline, running parallel to the course outlined above, one learns how properties of complex functions are reflected in and can be read off from phase portraits. The book contains more than 200 of these pictorial representations which endow individual faces to analytic functions. Phase portraits enhance the intuitive understanding of concepts in complex analysis and are expected to be useful tools for anybody working with special functions – even experienced researchers may be inspired by the pictures to new and challenging questions. Visual Complex Functions may also serve as a companion to other texts or as a reference work for advanced readers who wish to know more about phase portraits. Provides the reader with a deep appreciation of complex analysis and how this subject fits into mathematics. The first four chapters provide an introduction to complex analysis with many elementary and unusual applications. Chapters 5 to 7 develop the Cauchy theory and include some striking applications to calculus. Chapter 8 glimpses several appealing topics, simultaneously unifying the book and opening the door to further study. This 2003 edition is ideal for use in undergraduate and introductory graduate level courses in complex variables. This book describes a classical introductory part of complex analysis for university students in the sciences and engineering and could serve as a text or reference book. It places emphasis on rigorous proofs, presenting the subject as a fundamental mathematical theory. The volume begins with a problem dealing with curves related to Cauchy's integral theorem. To deal with it rigorously, the author gives detailed descriptions of the homotopy of plane curves. Since the residue theorem is important in both pure and applied mathematics, the author gives a fairly detailed explanation of how to apply it to numerical calculations; this should be sufficient for those who are studying complex analysis as a tool. THIS IS A DRAFT MANUSCRIPT VERSION. This version of the book is being made available to benefit students who wish to have a copy of the book before the final print version is available. This version preserves the beautifully hand-drawn illustrations of the original. THIS IS A DRAFT MANUSCRIPT VERSION. After having taught the traditional senior-level undergraduate complex variables course many times, and after writing some dozen research papers incorporating the elements of this subject, the first author became aware of a need for a "down to earth" presentation of the important applicable features. The development here is intuitive and inductive as opposed to the usual rigorous and deductive presentations. Mathematical maturity of the reader is not required, as no use is made of epsilon-delta arguments. The inductive exposition offered here requires that the reader first study in detail specific concrete examples; she is then called upon to "conjecture" general truths based on her experience with special cases. In this way the essential facts needed for a good working knowledge of complex analysis are made to stand out clearly, and the intricacies of the subject are mastered from first-hand experience. The only background required of the reader is the usual three semester intuitive level calculus course given at most colleges and universities in the freshman and sophomore years. Even then, it is assumed that the reader has only a very vague appreciation for the more subtle aspects of the calculus such as infinite series and improper integrals. While a rigorous formulation of the subject is absent from these pages, there is no attempt to "water down" the information needed in practical applications. Indeed, use is made of material and intuitive insights which the authors have gleaned from their own research in complex variables which is not usually found in text books. As an example, unusual stress is placed upon actually visualizing specific functions through graphical representations. The exact definition of an analytic function is not presented until the fourth chapter, even though the concept is used in the second and third chapters. The student is made to see that she can deal with a concept even though it is not precisely formulated, and that definitions often evolve slowly as experience is gained with special cases. Thus the reader gradually develops a "feel" for this subject. It is hoped that this intuitive presentation will be of value to a wide audience of readers. It can be used as a text book for the usual one semester undergraduate complex variable course given in the junior or senior year. Since this intuitive presentation proceeds at a considerably faster pace than most rigorous texts, advanced topics not usually given in a one semester course can be included. Mathematical maturity is not required of the student, and even advanced sophomores should be able to profit from this course. If the professor also wishes to introduce a rigorous development of complex analysis, this text can serve as a tool for "anchoring the students' feet to the ground" so that they will better appreciate the need for a deductive development. Engineers and physicists usually welcome intuitive developments of advanced mathematics, and this presentation might be of value in a one semester course for them. This book is also intended for self-study. There are many example problems, and every problem posed for the reader is solved in detail in an appendix. In addition, each chapter is followed by review problems which are also solved in full in the appendix. Students who have taken the traditional course in complex analysis might find that reading this book helps to add concreteness to the general theoretical development they have witnessed. This book provides a comprehensive introduction to complex analysis in several variables. One major focus of the book is extension phenomena alien to the one-dimensional theory (Hartog's Kugelsatz, theorem of Cartan-Thullen, Bochner's theorem). The book primarily aims at students starting to work in the field of complex analysis in several variables and teachers who want to prepare a university lecture. Therefore, the book contains more than 50 examples and more than 100 supporting exercises. 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 systems are everywhere. Ecosystems, financial markets, traffic, the economy, the internet and social media are complex systems. This textbook summarizes our understanding of complex systems and the methodological progress made over the past 20 years in a clear, structured, and comprehensive way. Shorter version of Markushevich's Theory of Functions of a Complex Variable, appropriate for advanced undergraduate and graduate courses in complex analysis. More than 300 problems, some with hints and answers. 1967 edition. In addition to being mathematically elegant, complex variables provide a powerful tool for solving problems that are either very difficult or virtually impossible to solve in any other way. Part I of this text provides an introduction to the subject, including analytic functions, integration, series, and residue calculus and also includes transform methods, ODEs in the complex plane, numerical methods and more. Part II contains conformal mappings, asymptotic expansions, and the study of Riemann-Hilbert problems. The authors also provide an extensive array of applications, illustrative examples and homework exercises. This book is ideal for use in introductory undergraduate and graduate level courses in complex variables. This book discusses the complex theory of differential equations or more precisely, the theory of differential equations on complex-analytic manifolds. Although the theory of differential equations on real manifolds is well known – it is described in thousands of papers and its usefulness requires no comments or explanations – to date specialists on differential equations have not focused on the complex theory of partial differential equations. However, as well as being remarkably beautiful, this theory can be used to solve a number of problems in real theory, for instance, the Poincaré balayage problem and the mother body problem in geophysics. The monograph does not require readers to be familiar with advanced notions in complex analysis, differential equations, or topology. With its numerous examples and exercises, it appeals to advanced undergraduate and graduate students, and also to researchers wanting to familiarize themselves with the subject. An Introduction to the Chemistry of Complex Compounds discusses the fundamental concepts that are essential in understanding the underlying principles of complex compounds. The coverage of the book includes the compounds of the hexa, penta, and tetrammine type; compounds of the tri, dl, monoamine and hexacido types for the coordination number of 6; and complex compounds with a coordination number of 4. The text also covers the effects and chemical properties of complex compounds, such as the nature of the force of complex formation; the mutual effects of coordinated groups; and acid-base properties, oxidation-reduction properties, and solution equilibriums of complex compounds. The book will be of great use to chemists and chemical engineers. This book examines life not from the reductionist point of view, but rather asks the questions: what are the universal properties of living systems, and how can one construct from there a phenomenological theory of life that leads naturally to complex processes such as reproductive cellular systems, evolution and differentiation? The presentation is relatively non-technical to appeal to a broad spectrum of students and researchers. This book explores the interdisciplinary field of complex systems theory. By the end of the book, readers will be able to understand terminology that is used in complex systems and how they are related to one another; see the patterns of complex systems in practical examples; map current topics, in a variety of fields, to complexity theory; and be able to read more advanced literature in the field. The book begins with basic systems concepts and moves on to how these simple rules can lead to complex behavior. The author then introduces non-linear systems, followed by pattern formation, and networks and information flow in systems. Later chapters cover the thermodynamics of complex systems, dynamical patterns that arise in networks, and how game theory can serve as a framework for decision making. The text is interspersed with both philosophical and quantitative arguments, and each chapter ends with questions and prompts that help readers make more connections. “The text provides a useful overview of complex systems, with enough detail to allow a reader unfamiliar with the topic to understand the basics. The book stands out for its comprehensiveness and approachability. It will be particularly useful as a text for introductory physics courses. Tranquillo’s strength is in delivering a vast amount of information in a succinct manner.... A reader can find information quickly and efficiently—that is, in my opinion, the book’s greatest value.” (Stefani Crabtree, Physics Today) Illuminating, widely praised book on analytic geometry of circles, the Moebius transformation, and 2-dimensional non-Euclidean geometries. Now available in paperback, this successful radical approach to complex analysis replaces the standard calculational arguments with new geometric ones. With several hundred diagrams, and far fewer prerequisites than usual, this is the first visual intuitive introduction to complex analysis.Although designed for use by undergraduates in mathematics and science, the novelty of the approach will also interest professional mathematicians. The aim of this comparatively short textbook is a sufficiently full exposition of the fundamentals of the theory of functions of a complex variable to prepare the student for various applications. Several important applications in physics and engineering are considered in the book. This thorough presentation includes all theorems (with a few exceptions) presented with proofs. No previous exposure to complex numbers is assumed. The textbook can be used in one-semester or two-semester courses. In one respect this book is larger than usual, namely in the number of detailed solutions of typical problems. This, together with various problems, makes the book useful both for self- study and for the instructor as well. A specific point of the book is the inclusion of the Laplace transform. These two topics are closely related. Concepts in complex analysis are needed to formulate and prove basic theorems in Laplace transforms, such as the inverse Laplace transform formula. Methods of complex analysis provide solutions for problems involving Laplace transforms. Complex numbers lend clarity and completion to some areas of classical analysis. These numbers found important applications not only in the mathematical theory, but in the mathematical descriptions of processes in physics and engineering. Complex Systems lie at the heart of a variety of large-scale phenomena of great significance - global warming, ice ages, water, poverty, pandemics - and this text uses these case studies as motivations and contexts to explore complex systems and related topics of nonlinear dynamics and power-law statistics. Although detailed mathematical descriptions of these topics can be challenging, the consequences of a system being nonlinear, power-law, or complex are in fact quite accessible. This book blends a tutorial approach to the mathematical aspects of complex systems together with a complementary narrative on the global/ecological/societal implications of such systems. Nearly all engineering undergraduate courses focus on mathematics and systems which are small scale, linear, and Gaussian. Unfortunately there is not a single large-scale ecological or social phenomenon that is scalar, linear, and Gaussian. This book offers insights to better understand the large-scale problems facing the world and to realize that these cannot be solved by a single, narrow academic field or perspective. Instead, the book seeks to emphasize understanding, concepts, and ideas, in a way that is mathematically rigorous, so that the concepts do not feel vague, but not so technical that the mathematics get in the way. The book is intended for students in technical domains such as engineering, computer science, physics, mathematics, and environmental studies. This second edition adds nine new examples, over 30 additional problems, 50 additional figures, and three new chapters offering a detailed study of system decoupling, extensive solutions to chapter problems, and a timely discussion on the complex systems challenges associated with COVID-19 and pandemics in general. This book is an attempt to cover some of the salient features of classical, one variable complex function theory. The approach is analytic, as opposed to geometric, but the methods of all three of the principal schools (those of Cauchy, Riemann and Weierstrass) are developed and exploited. The book goes deeply into several topics (e.g. convergence theory and plane topology), more than is customary in introductory texts, and extensive chapter notes give the sources of the results, trace lines of subsequent development, make connections with other topics, and offer suggestions for further reading. These are keyed to a bibliography of over 1,300 books and papers, for each of which volume and page numbers of a review in one of the major reviewing journals is cited. These notes and bibliography should be of considerable value to the expert as well as to the novice. For the latter there are many references to such thoroughly accessible journals as the American Mathematical Monthly and L'Enseignement Mathématique. Moreover, the actual prerequisites for reading the book are quite modest; for example, the exposition assumes no prior knowledge of manifold theory, and continuity of the Riemann map on the boundary is treated without measure theory. At almost all academic institutions worldwide, complex variables and analytic functions are utilized in courses on applied mathematics, physics, engineering, and other related subjects. For most students, formulas alone do not provide a sufficient introduction to this widely taught material, yet illustrations of functions are sparse in current books on the topic. This is the first primary introductory textbook on complex variables and analytic functions to make extensive use of functional illustrations. Aiming to reach undergraduate students entering the world of complex variables and analytic functions, this book utilizes graphics to visually build on familiar cases and illustrate how these same functions extend beyond the real axis. It covers several important topics that are omitted in nearly all recent texts, including techniques for analytic continuation and discussions of elliptic functions and of Wiener–Hopf methods. It also presents current advances in research, highlighting the subject's active and fascinating frontier. The primary audience for this textbook is undergraduate students taking an introductory course on complex variables and analytic functions. It is also geared toward graduate students taking a second semester course on these topics, engineers and physicists who use complex variables in their work, and students and researchers at any level who want a reference book on the subject. Like real analysis, complex analysis has generated methods indispensable to mathematics and its applications. Exploring the interactions between these two branches, this book uses the results of real analysis to lay the foundations of complex analysis and presents a unified structure of mathematical analysis as a whole. To set the groundwork and mitigate the difficulties newcomers often experience, An Introduction to Complex Analysis begins with a complete review of concepts and methods from real analysis, such as metric spaces and the Green-Gauss Integral Formula. The approach leads to brief, clear proofs of basic statements - a distinct advantage for those mainly interested in applications. Alternate approaches, such as Fichera's proof of the Goursat Theorem and Estermann's proof of the Cauchy's Integral Theorem, are also presented for comparison. Discussions include holomorphic functions, the Weierstrass Convergence Theorem, analytic continuation, isolated singularities, homotopy, Residue theory, conformal mappings, special functions and boundary value problems. More than 200 examples and 150 exercises illustrate the subject matter and make this book an ideal text for university courses on complex analysis, while the comprehensive compilation of theories and succinct proofs make this an excellent volume for reference. 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 This book provides a rigorous yet elementary introduction to the theory of analytic functions of a single complex variable. While presupposing in its readership a degree of mathematical maturity, it insists on no formal prerequisites beyond a sound knowledge of calculus. Starting from basic definitions, the text slowly and carefully develops the ideas of complex analysis to the point where such landmarks of the subject as Cauchy's theorem, the Riemann mapping theorem, and the theorem of Mittag-Leffler can be treated without sidestepping any issues of rigor. The emphasis throughout is a geometric one, most pronounced in the extensive chapter dealing with conformal mapping, which amounts essentially to a "short course" in that important area of complex function theory. Each chapter concludes with a wide selection of exercises, ranging from straightforward computations to problems of a more conceptual and thought-provoking nature. Textbooks, even excellent ones, are a reflection of their times. Form and content of books depend on what the students know already, what they are expected to learn, how the subject matter is regarded in relation to other divisions of mathematics, and even how fashionable the subject matter is. It is thus not surprising that we no longer use such masterpieces as Hurwitz and Courant's Funktionentheorie or Jordan's Cours d'Analyse in our courses. The last two decades have seen a significant change in the techniques used in the theory of functions of one complex variable. The important role played by the inhomogeneous Cauchy-Riemann equation in the current research has led to the reunification, at least in their spirit, of complex analysis in one and in several variables. We say reunification since we think that Weierstrass, Poincare, and others (in contrast to many of our students) did not consider them to be entirely separate subjects. Indeed, not only complex analysis in several variables, but also number theory, harmonic analysis, and other branches of mathematics, both pure and applied, have required a reconsidera tion of analytic continuation, ordinary differential equations in the complex domain, asymptotic analysis, iteration of holomorphic functions, and many other subjects from the classic theory of functions of one complex variable. This ongoing reconsideration led us to think that a textbook incorporating some of these new perspectives and techniques had to be written. The boundaries between simple and complicated, and complicated and complex system designations are fuzzy and debatable, even using quantitative measures of complexity. However, if you are a biomedical engineer, a biologist, physiologist, economist, politician, stock market speculator, or politician, you have encountered complex systems. Furthermore, your success depends on your ability to successfully interact with and manage a variety of complex systems. In order not to be blindsided by unexpected results, we need a systematic, comprehensive way of analyzing, modeling, and simulating complex systems to predict non-anticipated outcomes. In its engaging first chapters, the book introduces complex systems, Campbell's Law, and the Law of Unintended Consequences, and mathematics necessary for conversations in complex systems. Subsequent chapters illustrate concepts via commonly studied biological mechanisms. The final chapters focus on higher-level complexity problems, and introduce complexity in economic systems. Designed as a reference for biologists and biological engineers, Introduction to Complexity and Complex Systems lends itself to use in a classroom course to introduce advanced students studying biomedical engineering, biophysics, or physiology to complex systems. Engaging and illustrative, this book aids scientists and decision makers in managing biological complexity and complex systems. This textbook introduces the subject of complex analysis to advanced undergraduate and graduate students in a clear and concise manner. Key features of this textbook: effectively organizes the subject into easily manageable sections in the form of 50 class-tested lectures, uses detailed examples to drive the presentation, includes numerous exercise sets that encourage pursuing extensions of the material, each with an “Answers or Hints” section, covers an array of advanced topics which allow for flexibility in developing the subject beyond the basics, provides a concise history of complex numbers. An Introduction to Complex Analysis will be valuable to students in mathematics, engineering and other applied sciences. Prerequisites include a course in calculus. 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. An Introduction to Complex Analysis in Several Variables Introduction to Complex AnalysisBy Michael Taylor This is a self-contained book that covers the standard topics in introductory analysis and that in addition constructs the natural, rational, real and complex numbers, and also handles complex-valued functions, sequences, and series.The book teaches how to write proofs. Fundamental proof-writing logic is covered in Chapter 1 and is repeated and enhanced in two appendices. Many examples of proofs appear with words in a different font for what should be going on in the proof writer's head.The book contains many examples and exercises to solidify the understanding. The material is presented rigorously with proofs and with many worked-out examples. Exercises are varied, many involve proofs, and some provide additional learning materials. Easily accessible Includes recent developments Assumes very little knowledge of differentiable manifolds and functional analysis Particular emphasis on topics related to mirror symmetry (SUSY, Kaehler-Einstein metrics, Tian-Todorov lemma) Since the appearance of Kobayashi's book, there have been several re sults at the basic level of hyperbolic spaces, for instance Brody's theorem, and results of Green, Kiernan, Kobayashi, Noguchi, etc. which make it worthwhile to have a systematic exposition. Although of necessity I re produce some theorems from Kobayashi, I take a different direction, with different applications in mind, so the present book does not super sede Kobayashi's. My interest in these matters stems from their relations with diophan tine geometry. Indeed, if X is a projective variety over the complex numbers, then I conjecture that X is hyperbolic if and only if X has only a finite number of rational points in every finitely generated field over the rational numbers. There are also a number of subsidiary conjectures related to this one. These conjectures are qualitative. Vojta has made quantitative conjectures by relating the Second Main Theorem of Nevan linna theory to the theory of heights, and he has conjectured bounds on heights stemming from inequalities having to do with diophantine approximations and implying both classical and modern conjectures. Noguchi has looked at the function field case and made substantial progress, after the line started by Grauert and Grauert-Reckziegel and continued by a recent paper of Riebesehl. The book is divided into three main parts: the basic complex analytic theory, differential geometric aspects, and Nevanlinna theory. Several chapters of this book are logically independent of each other. The study of complex variables is beautiful from a purely mathematical point of view, and very useful for solving a wide array of problems arising in applications. This introduction to complex variables, suitable as a text for a one-semester course, has been written for undergraduate students in applied mathematics, science, and engineering. Based on the authors' extensive teaching experience, it covers topics of keen interest to these students, including ordinary differential equations, as well as Fourier and Laplace transform methods for solving partial differential equations arising in physical applications. Many worked examples, applications, and exercises are included. With this foundation, students can progress beyond the standard course and explore a range of additional topics, including generalized Cauchy theorem, Painlevé equations, computational methods, and conformal mapping with circular arcs. Advanced topics are labeled with an asterisk and can be included in the syllabus or form the basis for challenging student projects. Straightforward in concise, this introductory volume treats the theory rigorously but uses a minimum of sophisticated machinery and assumes no prior knowledge of topology. Priestley presents the major theorems as early as possible, so that those meeting complex analysis for the first time can appreciate the power and elegance of the subject by seeing applications of results, both practical and theoretical. A valuable resource for pure and applied mathematicians, this book is also suitable for graduate students and, as a reference, for engineers. An introduction to complex analysis for students with some knowledge of complex numbers from high school. It contains sixteen chapters, the first eleven of which are aimed at an upper division undergraduate audience. The remaining five chapters are designed to complete the coverage of all background necessary for passing PhD qualifying exams in complex analysis. Topics studied include Julia sets and the Mandelbrot set, Dirichlet series and the prime number theorem, and the uniformization theorem for Riemann surfaces, with emphasis placed on the three geometries: spherical, euclidean, and hyperbolic. Throughout, exercises range from the very simple to the challenging. The book is based on lectures given by the author at several universities, including UCLA, Brown University, La Plata, Buenos Aires, and the Universidad Autonomo de Valencia, Spain. facts. An elementary acquaintance with topology, algebra, and analysis (in cluding the notion of a manifold) is sufficient as far as the understanding of this book is concerned. All the necessary properties and theorems have been gathered in the preliminary chapters -either with proofs or with references to standard and elementary textbooks. The first chapter of the book is devoted to a study of the rings Oa of holomorphic functions. The notions of analytic sets and germs are introduced in the second chapter. Its aim is to present elementary properties of these objects, also in connection with ideals of the rings Oa. The case of principal germs (§5) and one-dimensional germs (Puiseux theorem, §6) are treated separately. The main step towards understanding of the local structure of analytic sets is Ruckert's descriptive lemma proved in Chapter III. Among its conse quences is the important Hilbert Nullstellensatz (§4). In the fourth chapter, a study of local structure (normal triples, § 1) is followed by an exposition of the basic properties of analytic sets. The latter includes theorems on the set of singular points, irreducibility, and decom position into irreducible branches (§2). The role played by the ring 0 A of an analytic germ is shown (§4). Then, the Remmert-Stein theorem on re movable singularities is proved (§6). The last part of the chapter deals with analytically constructible sets (§7).

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