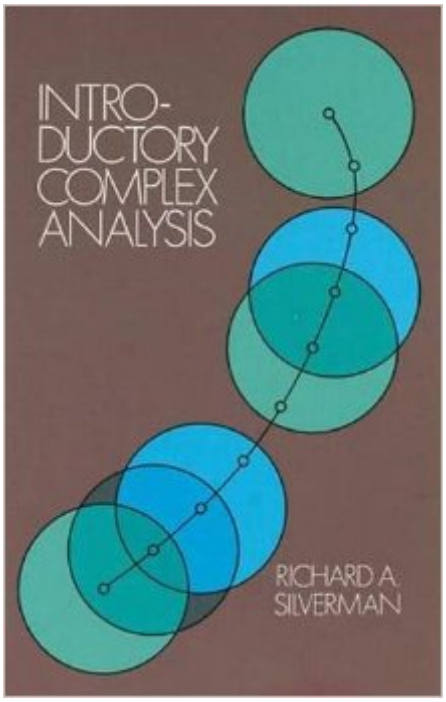
Introductory Complex Analysis (Dover Books On Mathematics)



Synopsis

Introductory Complex Analysis is a scaled-down version of A. I. Markushevich’s masterly three-volume "Theory of Functions of a Complex Variable." Dr. Richard Silverman, the editor and translator of the original, has prepared this shorter version expressly to meet the needs of a one-year graduate or undergraduate course in complex analysis. In his selection and adaptation of the more elementary topics from the original larger work, he was guided by a brief course prepared by Markushevich himself.The book begins with fundamentals, with a definition of complex numbers, their geometric representation, their algebra, powers and roots of complex numbers, set theory as applied to complex analysis, and complex functions and sequences. The notions of proper and improper complex numbers and of infinity are fully and clearly explained, as is stereographic projection. Individual chapters then cover limits and continuity, differentiation of analytic functions, polynomials and rational functions, Mobius transformations with their circle-preserving property, exponentials and logarithms, complex integrals and the Cauchy theorem , complex series and uniform convergence, power series, Laurent series and singular points, the residue theorem and its implications, harmonic functions (a subject too often slighted in first courses in complex analysis), partial fraction expansions, conformal mapping, and analytic continuation.Elementary functions are given a more detailed treatment than is usual for a book at this level. Also, there is an extended discussion of the Schwarz-Christolfel transformation, which is particularly important for applications.There is a great abundance of worked-out examples, and over three hundred problems (some with hints and answers), making this an excellent textbook for classroom use as well as for independent study. A noteworthy feature is the fact that the parentage of this volume makes it possible for the student to pursue various advanced topics in more detail in the three-volume original, without the problem of having to adjust to a new terminology and notation .In this way, IntroductoryComplex Analysis serves as an introduction not only to the whole field of complex analysis, but also to the magnum opus of an important contemporary Russian mathematician.

Book Information

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Customer Reviews

This book might just be the best Dover text out there-which isn't really saying much, considering how many of their books are total stinkers. To me, this is nearly an ideal math book: clear logical development punctuated with very well-chosen exercises. I know of no better book on the basics of complex analysis. If you've seen basic material about complex numbers and functions, as well as a few basic facts about real analysis, you can start in chapter seven, where complex integration is introduced, and used to prove all sorts of wonderful things. But if you haven't seen these basics, they are well-presented in the opening chapters, making this book extremely accessible. But it is in chapter seven that the book really begins, which is where the fundamental theorems of complex analysis start being proved. All of these proofs and chapters are extremely well-written, making the logical structure of the whole theory entirely transparent. This book is just an introduction, as the title says, and there is lots of advanced material not touched here, but this book provides an excellent foundation for further study. Chapter Titles: 1. Complex Numbers, Functions, and Sequences 2. Limits and Continuity 3. Differentiation. Analytic Functions 4. Polynomials and Rational Functions 5. Mobius Transforms 6. Exponentials and Logarithms 7. Complex Integrals. Cauchy's Integral Theorem 8. Cauchy's Integral Formula and Its Implications 9. Complex Series. Uniform Convergence 10. Power Series 11. Laurent Series. Singular points 12. The Reside Theorem and Its Implications 13. Harmonic Functions 14. Infinite Product and Partial Fraction Expansions 15. Conformal Mapping 16. Analytic Continuation

I was amazed by this book. In a small amount of space, it manages to present most of the important theoretical aspects of complex analysis, and rigorously, so you get all the detailed proofs. However, the book isn't big on applications, so you might consider getting an applied text to supplement this one. Also, the book is quite advanced. Some background in advanced calculus (Widder's book works great) would help you make more sense of the text. I read this after I learned applied compl. analysis, so I can't really judge this book as an introduction to the field, but for someone who is

familiar with the essentials of complex analysis, this is an excellent theoretical supplement.

I originally bought this text because of the low price - $10 or so for a book on Complex Analysis is a steal, given what many textbooks are, new or used. Also, the book had positive to excellent reviews on this site, so I figured that I had little to lose.As it turns out, the book was a big disappointment for me. Essentially, it is an abridged edition of a much larger work written by a prominent Russian mathematician. Hence, the organization is clear and logical, and for those who have already taken a class and are reasonably considered experts, there are many clear and fascinating interconnections. There is nothing really wrong with the development of the book, and Dr. Silverman understands the topic well.Yet, what I was looking for was something to help me to understand the class and subject, and this was where the book proved unhelpful. It is too short for the average reader to be able to appreciate the subtleties of thought and organization of a master mathematician, and contains too few examples to help a student. The examples are basic and perfunctory and do not deepen understanding and are a kind of non-essential blip in the logical development. It would have been better to have no examples and to have a very technical monograph on part of the topic than to pretend to thoroughness re: complex analysis in its entirety.So, for a student it is not helpful, and specialists can do much better. On the other hand, the development is clear and insightful, and $10 is pretty cheap for a book of reasonable quality.

Last year i took a graduate course on complex analysis having very little previous knowledge about it, cause i study physics and this was the book i used to help my self. This book resulted being a delight, it’s wonderfull the way it is written the clarity, all theorems with proofs and starts from the basics till more advanced topics. I recently read it completely and the same thing happened: is a wonderfull book, my plan now is to get the bigger work of Markushevich, to extend the knowledge. In one word buy it you won’t regret it!

Silverman’s book starts at complex numbers functions and sequences, and it covers some central aspects of complex function theory, elementary geometry, Mobius transformations, harmonic and analytic functions. The central topics are (in this order) geometry of the plane, fundamentals of complex numbers, limits and a brief calculus review, calculus and geometry of the plane, harmonic functions, complex numbers, integrals, power series and analytic functions, and the standard Cauchy-and residue theorems, ending with a brief chapter on conformal mappings. The book was published first in 1967, but reprinted since by Dover. It is suitable as a text or as a supplement in a

standard course in complex function theory, at the late undergraduate level. While it contains the standard elements in such a course, we note that a systematic treatment of power series comes relatively late, in Chapter 10, beginning on page 195 (halfway into the book.) Some readers might want to begin with that. Of other Dover titles on the same subject we recommend the books by Volkovyskii et al, Schwerdtfeger, and Flanigan. Review by Palle Jorgensen, August 5, 2006.

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