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<<分析（第1卷）>>

图书基本信息

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内容概要

The present book strives for clarity and transparency. Right from the begin-ning, it requires from the reader a willingness to deal with abstract concepts, as well as a considerable measure of self-initiative. For these e&, rts, the reader will be richly rewarded in his or her mathematical thinking abilities, and will possess the foundation needed for a deeper penetration into mathematics and its applications.

This book is the first volume of a three volume introduction to analysis. It de- veloped from. courses that the authors have taught over the last twenty six years at the Universities of Bochum, Kiel, Zurich, Basel and Kassel. Since we hope that this book will be used also for self-study and supplementary reading, we have included far more material than can be covered in a three semester sequence. This allows us to provide a wide overview of the subject and to present the many beautiful and important applications of the theory. We also demonstrate that mathematics possesses, not only elegance and inner beauty, but also provides efficient methods for the solution of concrete problems.

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书籍目录

Preface
Chapter Ⅰ Foundations
1 Fundamentals of Logic
2 Sets
Elementary Facts
The Power Set
Complement, Intersection and Union
Products
Families of Sets
3 Functions,
Simple Examples
Composition of Functions
Commutative Diagrams
Injections, Surjections and Bijections
Inverse Functions
Set Valued Functions
4 Relations and Operations
Equivalence Relations
Order Relations
Operations
5 The Natural Numbers
The Peano Axioms
The Arithmetic of Natural Numbers
The Division Algorithm
The Induction Principle
Recursive Definitions
6 Countability
Permutations
Equinumerous Sets
Countable Sets
Infinite Products
7 Groups and Homomorphisms
Groups
Subgroups
Cosets
Homomorphisms
Isomorphisms
8 R.ings, Fields and Polynomials
Rings
The Binomial Theorem
The Multinomial Theorem
Fields
Ordered Fields
Formal Power Series
Polynomials

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Polynomial Functions
Division of Polynomiajs
Linear Factors
Polynomials in Several Indeterminates
9 The Rational Numbers
The Integers
The Rational Numbers
Rational Zeros of Polynomials
Square Roots
10 The Real Numbers
Order Completeness
Dedekind's Construction of the Real Numbers
The Natural Order on R
The Extended Number Line
A Characterization of Supremum and Infimum
The Archimedean Property
The Density of the Rational Numbers in R
nth Roots
The Density of the Irrational Numbers in R
Intervals
Chapter II Convergence
Chapter III Continuous Functions
Chapter IV Differentiation in One Variable
Chapter V Sequences of Functions
Appendix Introduction to Mathematical Logic
Bibliography
Index

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章节摘录

版权页： 插图： In this chapter, approximations are once again the center of our interest. Just as in Chapter Ⅱ, we study sequences and series. The difference is that we consider here the more complex situation of sequences whose terms are functions. In this circumstance there are two viewpoints: We can consider such sequences locally,that is, at each point, or globally. In the second case it is natural to consider the terms of the sequence as elements of a function space so that we are again in the situation of Chapter Ⅱ. If the functions in the sequence are all bounded, then we have a sequence in the Banach space of bounded functions, and we can apply all the results about sequences and series which we developed in the second chapter.This approach is particularly fruitful, allows short and elegant proofs, and, for the first time, demonstrates the advantages of the abstract framework in which we developed the fundamentals of analysis. In the first section we analyze the various concepts of convergence which appea in the study of sequences of functions. The most important of these is uniform convergence which is simply convergence in the space of bounded functions. The main result of this section is the Weierstrass majorant criterion which is nothing more than the majorant criterion from the second chapter applied to the Banach space of bounded functions. Section 2 is devoted to the connections between continuity, difFerentiability and convergence for sequences of functions. To our supply of concrete Banach spaces,we add one extremely important and natural example: the space of conthinuous functions on a compact metric space.

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