Introduction To Mathematical Logic Sixth Edition Discrete Mathematics And Its Applications l61b9e4b0d1320d47343d51a0081d405

Introduction to Mathematical Logic

Proofs from THE BOOK

A First Journey through Logic

Incompleteness, undecidability, and indefinability; recursive functions; computability; and Hilbert's Tenth Problem. Reprint of the PWS Publishing Company, Boston, 1995 edition.

This comprehensive overview of mathematical logic is designed primarily for advanced undergraduates and graduate students of mathematics. The treatment also contains much of interest to advanced students in computer science and philosophy. Topics include propositional logic, first-order languages and logic, incompleteness, undecidability, indefinability, recursive functions, computability, and Hilbert's Tenth Problem. Reprint of the PWS Publishing Company, Boston, 1995 edition.

A First Course in Logic

Basic algebra. Anyone who can write programs should have this ability.

What we say is true? - and also of computer science - how do I know this program will do what I think it will? This book helps students transition from problem solving to proving theorems, with a new chapter on number theory and over 150 new exercises.

Book of Proof

This long-established text continues to expose students to natural proofs and set-theoretic methods. Only requiring some abstract mathematical thinking, it offers enough material for either a one- or two-semester course on mathematical logic.

Measure Theory and Fine Properties of Functions, Revised Edition

Set theory can be considered a unifying theory for mathematics. This book covers the fundamentals of the subject.

A Friendly Introduction to Mathematical Logic

The Logic Book

Measure Theory and Functions, Revised Edition

The First Course in Logic is an introduction to first-order logic suitable for first and second year mathematicians and computer scientists. There are three components to this course: propositional logic; Boolean algebras; and predicate-first-order, logic. Logic is the basis of proofs in mathematics - how do we know what we say is true? and also of computer science - how do I know this program will do what I think it will? Surprisingly little mathematics is needed to learn and understand logic (this course doesn't involve any calculus). The real mathematical prerequisite is an ability to manipulate symbols; in other words, basic algebra. Anyone who can write programs should have this ability.

Introduction to Formal Languages

This is a compact introduction to some of the principal C0PCs of mathematical logic. In the belief that beginners should be exposed to the most natural and easiest proofs, I have used free-swinging set-theoretic methods. The significance of a demand for constructive proofs can be evaluated only after a certain amount of experience with mathematical logic has been obtained. If we are to be expelled from 'Girter's paradise' (as nonconstructive set theory was called Hilbert), at least we should know what we are missing. The major changes in this new edition are the following. (1) In Chapter 5, Effective Computability, Turing-computability is now the central notion, and diagrams (flow-charts) are used to construct Turing machines. There are also treatments of Markov algorithms, Herbrand-Godel-computability, register machines, and random access machines. Recursion theory is gone into a little more deeply, including the s-m-n theorem, the recursion theorem, and Rice's Theorem. (2) The proofs of the Incompleteness Theorems are now based upon the Diagonalization Lemma. Loh's Theorem and its connection with Godel's Second Theorem are also studied. (3) In Chapter 2, Quantification Theory, Henkin's proof of the completeness theorem has been postponed until the reader has gained more experience in proof techniques. The exposition of the proof itself has been improved by breaking it down into smaller pieces and using the notion of a scopegout theory. There is also an entirely new section on semantic trees.

Six Papers in Logic

This comprehensive overview of mathematical logic is designed primarily for advanced undergraduates and graduate students of mathematics. The treatment also contains much of interest to advanced students in computer science and philosophy. Topics include propositional logic, first-order languages and logic, incompleteness, undecidability, indefinability, recursive functions, computability, and Hilbert's Tenth Problem. Reprint of the PWS Publishing Company, Boston, 1995 edition.

A First Journey through Logic

The mathematical study of games is an intriguing endeavor with implications and applications that reach far beyond tic-tac-toe, chess, and poker to economics, business, and even biology and politics. Most texts on the subject, however, are written at the graduate level for those with strong mathematics, economics, or business backgrounds. In
Covers all areas, including operations on languages, context-sensitive languages, automata, decidability, syntax analysis, derivation languages, and more. Numerous worked examples, problem exercises, and elegant mathematical proofs. 1983 edition.

Computational Mathematics

Differential Equations: Theory, Technique, and Practice with Boundary Value Problems presents classical ideas and cutting-edge techniques for a contemporary, undergraduate-level, one- or two-semester course on ordinary differential equations. Authored by a widely respected researcher and teacher, the text covers standard topics such as partial diff.

How to Read and Do Proofs

Computational Mathematics: Models, Methods, and Analysis with MATLAB® and MPI is a unique book covering the concepts and techniques at the core of computational science. The author delivers a hands-on introduction to nonlinear, 2D, and 3D models; nonrectangular domains; systems of partial differential equations; and large algebraic problems requiring high-performance computing. The book shows how to apply a model, select a numerical method, implement computer simulations, and assess the ensuing results. Providing a wealth of MATLAB, Fortran, and C++ code online for download, the Second Edition of this very popular text includes a new chapter with two sections on the finite element method, two sections on shallow water waves, and two sections on the driven cavity problem. Introduces multiprocessor/multicore computers, parallel MATLAB, and message passing interface (MPI) in the chapter on high-performance computing. Updates and adds code and documentation. Computational Mathematics: Models, Methods, and Analysis with MATLAB® and MPI. Second Edition is an ideal textbook for an undergraduate course taught to mathematics, computer science, and engineering students. By using code in practical ways, students take their first steps toward more sophisticated numerical modeling.

Introduction to Mathematical Logic, Fifth Edition

Measure Theory and Fine Properties of Functions, Revised Edition provides a detailed examination of the central assertions of measure theory in n-dimensional Euclidean space. The book emphasizes the roles of Hausdorff measure and capacity in characterizing the fine properties of sets and functions. Topics covered include a quick review of abstract.

Introduction to Mathematical Logic

This textbook provides a self-contained introduction to decidability of first-order theories and their combination. The technical material is presented in a systematic and universal way and illustrated with plenty of examples and a range of proposed exercises. After an overview of basic first-order logic concepts, the authors discuss some model-theoretic notions like embeddings, diagrams, and elementary substructures. The text then goes on to explore an applicable way to deduce logical consequences from a given theory and presents sufficient conditions for a theory to be decidable. The chapters that follow focus on quantifier elimination, decidability of the combination of first-order theories and the basis of computability theory. The inclusion of a chapter on Gentzen calculus, cut elimination, and Craig interpolation, as well as a chapter on combination of theories and preservation of decidability, help to set this volume apart from similar books in the field. Decidability of Logical Theories and their Combination is ideal for graduate students of Mathematics and is equally suitable for Computer Science, Philosophy and Physics students who are interested in gaining a deeper understanding of the subject. The book is also directed to researchers that intend to get acquainted with first-order theories and their combination.

Introduction to Mathematical Logic

Introduction to Number Theory

Logic originally meaning "of the word" or "of what is spoken," is generally held to consist of the systematic study of the form of arguments. A valid argument is one where there is a specific relation of logical support between the assumptions of the argument and its conclusion. There is no universal agreement as to the exact scope and subject matter of logic, but it has traditionally included the classification of arguments, the systematic exposition of the logical form common to all valid arguments, the study of inference, including fallacies, and the study of semantics, including paradoxes. Historically, logic has been studied in philosophy and mathematics and recently logic has been studied in computer science, linguistics, psychology, and other fields. The book is about the logic and talks about various aspects of it such as general character of the enquiry, argument from analogy, mathematical reasoning, etc. This book will prove to be very useful for the people interested in logic as well as the students of logic.

A Concise Introduction to Mathematical Logic

This book is an introduction to the language and standard proof methods of mathematics. It is a bridge from the computational courses (such as calculus or differential equations) that students typically encounter in their first year of college to a more abstract outlook. It lays a foundation for more theoretical courses such as topology, analysis and abstract algebra. Although it may be more meaningful to the student who has had some calculus, there is really no prerequisite other than a measure of mathematical maturity.

Set Theory

Part I of this coherent, well-organized text deals with formal principles of inference and definition. Part II explores elementary intuitive set theory, with separate chapters on sets, relations, and functions. Ideal for undergraduates.

Differential Equations

Strong reasoning skills are an important aspect to cultivate in life, as they directly impact decision making on a daily basis. By examining the different ways the world views logic and order, new methods and techniques can be employed to help expand on this skill further in the future. Philosophical Perceptions on Logic and Order is a pivotal scholarly resource that discusses the evolution of logical reasoning and future applications for these types of processes. Highlighting relevant topics including logic patterns, deductive logic, and inductive logic, this publication is an ideal reference source for academicians, students, and researchers that would like to expand their understanding of how society currently employs the use of logical reasoning techniques.

Introducing Game Theory and its Applications

This straightforward guide describes the main methods used to prove mathematical theorems. Shows how and when to use each technique such as the contrapositive, induction and proof by contradiction. Each method is illustrated by step-by-step examples. The Second Edition features new chapters on nested quantifiers and proof by cases, and the number of exercises has been doubled with answers to odd-numbered exercises provided. This text will be useful as a supplement in mathematics and logic courses. Prerequisite is high-school algebra.

Introduction to Logic

Rigorous introduction is simple enough in presentation and context for wide range of students. Symbolizing sentences; logical inference; truth and validity; truth tables; terms, predicates, universal quantifiers; universal specification and laws of identity; more.

Introduction to Abstract Algebra
Mathematical logic developed into a broad discipline with many applications in mathematics, informatics, linguistics and philosophy. This text introduces the fundamentals of this field, and this new edition has been thoroughly expanded and revised.

Philosophical Perceptions on Logic and Order

Known for its accessible, precise approach, Epp's DISCRETE MATHEMATICS WITH APPLICATIONS, 5th Edition, introduces discrete mathematics with clarity and precision. Coverage emphasizes the major themes of discrete mathematics as well as the reasoning that underlies mathematical thought.

Introduction to Logic

Introduction to Abstract Algebra, Second Edition presents abstract algebra as the main tool underlying discrete mathematics and the digital world. It avoids the usual groups first/rings first dilemma by introducing semigroups and monoids, the multiplicative structures of rings, along with groups. This new edition of a widely adopted textbook covers applications from biology, science, and engineering. It offers numerous updates based on feedback from first edition adopters, as well as improved and simplified proofs of a number of important theorems. Many new exercises have been added, while new study projects examine skewfields, quaternions, and octonions. The first three chapters of the book show how functional composition, cycle notation for permutations, and matrix notation for linear functions provide techniques for practical computation. These three chapters provide a quick introduction to algebra, sufficient to exhibit irrational numbers or to gain a taste of cryptography. Chapters four through seven cover abstract groups and monoids, orthogonal groups, stochastic matrices, Lagrange's theorem, groups of units of monoids, homomorphisms, rings, and integral domains. The first seven chapters provide basic coverage of abstract algebra, suitable for a one-semester or two-quarter course. Each chapter includes exercises of varying levels of difficulty, chapter notes that point out variations in notation and approach, and study projects that cover an array of applications and developments of the theory. The final chapters deal with slightly more advanced topics, suitable for a second-semester or third-quarter course. These chapters delve deeper into the theory of rings, fields, and groups. They discuss modules, including vector spaces and abelian groups, group theory, and quasigroups. This textbook is suitable for use in an undergraduate course on abstract algebra for mathematics, computer science, and education majors, along with students from other STEM fields.

Discrete Mathematics with Applications

The aim of this book is to present mathematical logic to students who are interested in what this field is but have no intention of specializing in it. The point of view is to treat logic on an equal footing to any other topic in the mathematical curriculum. The book starts with a presentation of naive set theory, the theory of sets that mathematicians use on a daily basis. Each subsequent chapter presents one of the main areas of mathematical logic: first order logic and formal proofs, model theory, recursion theory, Gödel's incompleteness theorems, and, finally, the axiomatic set theory. Each chapter includes several interesting highlights outside of logic when possible/either in the main text, or as exercises or appendices. Exercises are an essential component of the book, and a good number of them are designed to provide an opening to additional topics of interest.

A First Course in Logic

At the intersection of mathematics, computer science, and philosophy, mathematical logic examines the power and limitations of formal mathematical thinking. In this expansion of Leary's user-friendly 1st edition, readers with no previous study in the field are introduced to the basics of model theory, proof theory, and computability theory. The text is designed to be used either in an upper division undergraduate classroom, or for self-study. Updating the 1st Edition's treatment of languages, structures, and deductions, leading to rigorous proofs of Gödel's First and Second Incompleteness Theorems, the expanded 2nd Edition includes a new introduction to incompleteness through computability as well as solutions to selected exercises.

Advanced Linear Algebra

Numerical Analysis for Engineers: Methods and Applications demonstrates the power of numerical methods in the context of solving complex engineering and scientific problems. The book helps to prepare future engineers and assists practicing engineers in understanding the fundamentals of numerical methods, especially their applications, limitations, and potentials. Each chapter contains many computational examples, as well as a section on applications that contain additional engineering examples. Each chapter also includes a set of exercise problems. The problems are designed to meet the needs of instructors in assigning homework and to help students with practicing the fundamental concepts. Although the book was developed with emphasis on engineering and technological problems, the numerical methods can also be used to solve problems in other fields of science.

Mathematics in Games, Sports, and Gambling

This work makes available to readers without specialized training in mathematics complete proofs of the fundamental metatheorems of standard (i.e., basically truth-functional) first order logic. Included in a complete proof, accessible to non-mathematicians, of the undecidability of first order logic, the most important fact about logic to emerge from the work of the last half-century. Hunter explains concepts of mathematics and set theory along the way for the benefit of non-mathematicians. He also provides ample exercises with comprehensive answers.