

with "toral" subalgebras replacing the more traditional Cartan subalgebras in the semisimple case. (2) The conjugacy theorem for Cartan subalgebras is proved (following D. J. Winter and G. D. Mostow) by elementary Lie algebra methods, avoiding the use of algebraic geometry.

Elementary Number Theory Springer Science & Business Media
The Whole Truth About Whole Numbers is an introduction to the field of Number Theory for students in non-math and non-science majors who have studied at least two years of high school algebra. Rather than giving brief introductions to a wide variety of topics, this book provides an in-depth introduction to the field of Number Theory. The topics covered are many of those included in an introductory Number Theory course for mathematics majors, but the presentation is carefully tailored to meet the needs of elementary education, liberal arts, and other non-mathematical majors. The text covers logic and proofs, as well as major concepts in Number Theory, and contains an abundance of worked examples and exercises to both clearly illustrate concepts and evaluate the students' mastery of the material.

How Math Explains the World Elsevier

This second edition updates the well-regarded 2001 publication with new short sections on topics like Catalan numbers and their relationship to Pascal's triangle and Mersenne numbers, Pollard rho factorization method, Hoggatt-Hensell identity. Koshy has added a new chapter on continued fractions. The unique features of the first edition like news of recent discoveries, biographical sketches of mathematicians, and applications--like the use of congruence in scheduling of a round-robin tournament--are being refreshed with current information. More challenging exercises are included both in the textbook and in the instructor's manual. *Elementary Number Theory with Applications 2e* is ideally suited for undergraduate students and is especially appropriate for prospective and in-service math teachers at the high school and middle school levels. * Loaded with pedagogical features including fully worked examples, graded exercises, chapter summaries, and computer exercises * Covers crucial applications of theory like computer security, ISBNs, ZIP codes, and UPC bar codes * Biographical sketches lay out the history of mathematics, emphasizing its roots in India and the Middle East

A Classical Introduction to Modern Number Theory Harper Collins

The acclaimed author of *A Tour of the Calculus* and *The Infinite Ascent* offers an enlightening and enthralling tour of the basics of mathematics, and reveals a world of fascination in fundamental mathematical ideas. *One, Two, Three* is David Berlinski's captivating exploration of the foundation of mathematics, its fundamental ideas, and why they matter. By unraveling the complex answers to these most elementary questions—What is a number? How do addition, subtraction, and other functions actually work? What are geometry and logic?—Berlinski reveals the intricacy behind their seemingly simple exteriors. Peppared with enlightening historical anecdotes and asides on some of history's most fascinating mathematicians, *One, Two, Three*,

reveals in the beauty of numbers as Berlinski shows us how and why these often slippery concepts are as essential to the field of mathematics as to who we are.

Problems of Number Theory in Mathematical Competitions Springer Science & Business Media

This book is intended to serve as a one-semester introductory course in number theory. Throughout the book a historical perspective has been adopted and emphasis is given to some of the subject's applied aspects; in particular the field of cryptography is highlighted. At the heart of the book are the major number theoretic accomplishments of Euclid, Fermat, Gauss, Legendre, and Euler, and to fully illustrate the properties of numbers and concepts developed in the text, a wealth of exercises have been included. It is assumed that the reader will have 'pencil in hand' and ready access to a calculator or computer. For students new to number theory, whatever their background, this is a stimulating and entertaining introduction to the subject.

Fermat's Last Theorem Springer Science & Business Media

Elementary Number Theory takes an accessible approach to teaching students about the role of number theory in pure mathematics and its important applications to cryptography and other areas. The first chapter of the book explains how to do proofs and includes a brief discussion of lemmas, propositions, theorems, and corollaries. The core of the text covers linear Diophantine equations; unique factorization; congruences; Fermat's, Euler's, and Wilson's theorems; order and primitive roots; and quadratic reciprocity. The authors also discuss numerous cryptographic topics, such as RSA and discrete logarithms, along with recent developments. The book offers many pedagogical features. The "check your understanding" problems scattered throughout the chapters assess whether students have learned essential information. At the end of every chapter, exercises reinforce an understanding of the material. Other exercises introduce new and interesting ideas while computer exercises reflect the kinds of explorations that number theorists often carry out in their research.

Friendly Introduction to Number Theory, a (Classic Version)

Springer

An undergraduate-level introduction to number theory, with the emphasis on fully explained proofs and examples. Exercises, together with their solutions are integrated into the text, and the first few chapters assume only basic school algebra. Elementary ideas about groups and rings are then used to study groups of units, quadratic residues and arithmetic functions with applications to enumeration and cryptography. The final part, suitable for third-year students, uses ideas from algebra, analysis, calculus and geometry to study Dirichlet series and sums of squares. In particular, the last chapter gives a concise account of Fermat's Last Theorem, from its origin in the ancient Babylonian and Greek study of Pythagorean triples to its recent proof by Andrew Wiles.

Elementary Number Theory Springer Science & Business Media

"The numbers one through nine have remarkable mathematical properties and characteristics. For instance, why do eight perfect card shuffles leave a standard deck of cards unchanged? Are there really "six degrees of separation" between all pairs of people? And how can any map need only four colors to ensure that no regions of the same color touch? In *Single Digits*, Marc Chamberland takes readers on a fascinating exploration of small numbers, from one to nine, looking at their history, applications, and connections to various areas of mathematics, including number theory, geometry, chaos theory, numerical analysis, and mathematical physics."--Jacket.

□□□□ JHU Press

The companion Web site -- To the student -- The foundations : logic, sets, and functions -- The fundamentals : algorithms, the integers, and matrices -- Mathematical reasoning -- Counting -- Advanced counting techniques -- Relations -- Graphs -- Trees -- Boolean algebra -- Modeling computation
Single Digits D.C. Heath

This book is a revised and greatly expanded version of our book *Elements of Number Theory* published in 1972. As with the first book the primary audience we envisage consists of upper level undergraduate mathematics majors and graduate students. We have assumed some familiarity with the material in a standard undergraduate course in abstract algebra. A large portion of Chapters 1-11 can be read even without such background with the aid of a small amount of supplementary reading. The later chapters assume some knowledge of Galois theory, and in Chapters 16 and 18 an acquaintance with the theory of complex variables is necessary. Number theory is an ancient subject and its content is vast. Any introductory book must, of necessity, make a very limited selection from the fascinating array of possible topics. Our focus is on topics which point in the direction of algebraic number theory and arithmetic algebraic geometry. By a careful selection of subject matter we have found it possible to exposit some rather advanced material without requiring very much in the way of technical background. Most of this material is classical in the sense that it was discovered during the nineteenth century and earlier, but it is also modern because it is intimately related to important research going on at the present time.

Elementary Introduction to Number Theory Jones & Bartlett Learning

This introduction to algebraic number theory via the famous problem of "Fermat's Last Theorem" follows its historical development, beginning with the work of Fermat and ending with Kummer's theory of "ideal" factorization. The more elementary topics, such as Euler's proof of the impossibility of $x+y=z$, are treated in an uncomplicated way, and new concepts and techniques are introduced only after having been motivated by specific problems. The book also covers in detail the application of Kummer's theory to quadratic integers and relates this to Gauss' theory of binary quadratic forms, an interesting and important connection that is not explored in any other book.

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