Introduction To Theory Of Numbers By Niven And Zuckerman

Number Theory Revealed: An Introduction acquaints undergraduates with the “Queen of Mathematics”. The text offers a fresh take on congruences, power residues, quadratic residues, primes, and Diophantine equations and presents hot topics like cryptography, factoring, and primality testing. Students are also introduced to beautiful enlightening questions like the structure of Pascal's triangle mod p p and modern twists on traditional questions like the values represented by binary quadratic forms and large solutions of equations. Each chapter includes an “elective appendix” with additional reading, projects, and references. An expanded edition, Number Theory Revealed: A Masterclass, offers a more comprehensive approach to these core topics and adds additional material in further chapters and appendices, allowing instructors to create an individualized course tailored to their own (and their students') interests.

· Divisibility· Congruences· Quadratic Reciprocity and Quadratic Forms· Some Functions of Number Theory· Some Diophantine Equations· Farey Fractions and Irrational Numbers· Simple Continued Fractions· Primes and Multiplicative Number Theory· Algebraic Numbers· The Partition Function · The Density of Sequences of Integers

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 intro ductory book must, of necessity, make a very limited selection from the fascinat ing 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 oftechnical background. Most of this material is classical in the sense that is was dis covered 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.

The majority of students who take courses in number theory are mathematics majors who will not become number theorists. Many of them will, however, teach mathematics at the high school or junior college level, and this book is intended for those students learning to teach, in addition to a careful presentation of the standard material usually taught in a first course in elementary number theory, this book includes a chapter on quadratic fields which the author has designed to make students think about some of the "obvious" concepts they have taken for granted earlier. The book also includes a large number of exercises, many of which are nonstandard.

Introduction to the Theory of Numbers

An Introduction to Probabilistic Number Theory

Algebraic Numbers and Functions

An Introduction to the Theory of Numbers

Geometry and the theory of numbers are as old as some of the oldest historical records of humanity. Ever since antiquity, mathematicians have discovered many beautiful interactions between the two subjects and recorded them in such classical texts as Euclid's Elements and Diophantus's Arithmetica. Nowadays, the field of mathematics that studies the interactions between number theory and algebraic geometry is known as arithmetic geometry. This book is an introduction to number theory and arithmetic geometry, and the goal of the text is to use geometry as the motivation to prove the main theorems in the book. For example, the fundamental theorem of arithmetic is a consequence of the tools we develop in order to find all the integral points on a line in the plane. Similarly, Gauss's law of quadratic reciprocity and the theory of continued fractions naturally arise when we attempt to determine the integral points on a curve in the plane given by a quadratic polynomial equation. After an introduction to the theory of diophantine equations, the rest of the book is structured in three acts that correspond to the study of the integral and rational solutions of linear, quadratic, and cubic curves, respectively. This book describes many applications including modern applications in cryptography; it also presents some recent results in arithmetic geometry. With many exercises, this book can be used as a text for a first course in number theory or for a subsequent course on arithmetic (or diophantine) geometry at the junior-senior level.

Includes up-to-date material on recent developments and topics of significant interest, such as elliptic functions and the new primality test Selects material from both the algebraic and analytic disciplines, presenting several different proofs of a single result to illustrate the differing viewpoints and give good insight

Building on the success of the first edition, An Introduction to Number Theory with Cryptography, Second Edition, increases coverage of the popular and important topic of cryptography, integrating it with traditional topics in number theory. The authors have written the text in an engaging style to reflect number theory's increasing popularity. The book is designed to be used by sophomore, junior, and senior undergraduates, but it is also accessible to advanced high school students and is appropriate for independent study. It includes a few more advanced topics for students who wish to explore beyond the traditional curriculum. Features of the second edition include Over 800 exercises, projects, and computer explorations Increased coverage of cryptography, including Vigenere, Stream, Transposition,and Block ciphers, along with RSA and discrete log-based systems "Check Your Understanding" questions for instant feedback to students New Appendices on "What is a proof?" and on Matrices Select basic (pre-RSA) cryptography now placed in an earlier chapter so that the topic can be covered right after the basic material on congruences Answers and hints for odd-numbered problems About the Authors: Jim Kraft received his Ph.D. from the University of Maryland in 1987 and has published several research papers in algebraic number theory. His previous teaching positions include the University of Rochester, St. Mary's College of California, and Ithaca College, and he has also worked in communications security. Dr. Kraft currently teaches mathematics at the Gilman School. Larry Washington received his Ph.D. from Princeton University in 1974 and has published extensively in number theory, including books on cryptography (with Wade Trappe), cyclotomic fields, and elliptic curves. Dr. Washington is currently Professor of Mathematics and Distinguished Scholar-Teacher at the University of Maryland.

This introductory textbook for graduate students presents modern developments in probabilistic number theory, many for the first time.
An Experimental Introduction to Number Theory
An Introductory Course in Elementary Number Theory
Introduction to Analytic and Probabilistic Number Theory
Number Theory Revealed: An Introduction

Divisibility - Natural numbers functions - Congruences - Solutions - Table of primes.

News about this title: — Author Marty Weissman has been awarded a Guggenheim Fellowship for 2020. (Learn more here.) — Selected as a 2018 CHOICE Outstanding Academic Title — 2018 PROSE Awards Honorable Mention An Illustrated Theory of Numbers gives a comprehensive introduction to number theory, with complete proofs, worked examples, and exercises. Its exposition reflects the most recent scholarship in mathematics and its history. Almost 500 sharp illustrations accompany elegant proofs, from prime decomposition through quadratic reciprocity. Geometric and dynamical arguments provide new insights, and allow for a rigorous approach with less algebraic manipulation. The final chapters contain an extended treatment of binary quadratic forms, using Conway's topograph to solve quadratic Diophantine equations (e.g., Pell's equation) and to study reduction and the finiteness of class numbers. Data visualizations introduce the reader to open questions and cutting-edge results in analytic number theory such as the Riemann hypothesis, boundedness of prime gaps, and the class number 1 problem. Accompanying each chapter, historical notes curate primary sources and secondary scholarship to trace the development of number theory within and outside the Western tradition. Requiring only high school algebra and geometry, this text is recommended for a first course in elementary number theory. It is also suitable for mathematicians seeking a fresh perspective on an ancient subject.

Introduction to Number Theory is dedicated to concrete questions about integers, to place an emphasis on problem solving by students. When undertaking a first course in number theory, students enjoy actively engaging with the properties and relationships of numbers. The book begins with introductory material, including uniqueness of factorization of integers and polynomials. Subsequent topics explore quadratic reciprocity, Hensel's Lemma, p-adic powers series such as exp(px) and log(1+px), the Euclidean property of some quadratic rings, representation of integers as norms from quadratic rings, and Pell's equation via continued fractions. Throughout the five chapters and more than 100 exercises and solutions, readers gain the advantage of a number theory book that focuses on doing calculations. This textbook is a valuable resource for undergraduates or those with a background in university level mathematics.

Number theory is the branch of mathematics primarily concerned with the counting numbers, especially primes. It dates back to the ancient Greeks, but today it has great practical importance in cryptography, from credit card security to national defence. This book introduces the main areas of number theory, and some of its most interesting problems.

An Introduction to Mathematics

A Very Short Introduction

Elementary Introduction to Number Theory

Topics from the Theory of Numbers

In this book, Professor Baker describes the rudiments of number theory in a concise, simple and direct manner.

These notes serve as course notes for an undergraduate course in number theory. Most if not all universities worldwide offer introductory courses in number theory for math majors and in many cases as an elective course. The notes contain a useful introduction to important topics that need to be addressed in a course in number theory. Proofs of basic theorems are presented in an interesting and comprehensive way that can be read and understood even by non-majors with the exception in the last three chapters where a background in analysis, measure theory and abstract algebra is required. The exercises are carefully chosen to broaden the understanding of the concepts. Moreover, these notes shed light on analytic number theory, a subject that is rarely seen or approached by undergraduate students. One of the unique characteristics of these notes is the careful choice of topics and its importance in the theory of numbers. The freedom is given in the last two chapters because of the advanced nature of the topics that are presented.

An Introduction to the Theory of NumbersThe Trillia GroupAn Introduction to the Theory of NumbersOxford University Press

This is the fifth edition of a work (first published in 1938) which has become the standard introduction to the subject. The book has grown out of lectures delivered by the authors at Oxford, Cambridge, Aberdeen, and other universities. It is neither a systematic treatise on the theory ofnumbers nor a 'popular' book for non-mathematical readers. It contains short accounts of the elements of many different sides of the theory, not usually combined in a single volume; and, although it is written for mathematicians, the range of mathematical knowledge presupposed is not greater thanthat of an intelligent first-year student. In this edition the main changes are in the notes at the end of each chapter; Sir Edward Wright seeks to provide up-to-date references for the reader who wishes to pursue a particular topic further and to present, both in the notes and in the text, areasonably accurate account of the present state of knowledge.

The Higher Arithmetic

AN INTRODUCTION TO THE THEORY OF NUMBERS, 5TH ED

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Number Theory

Natural numbers are the oldest human invention. This book describes their nature, laws, history and current status. It has seven chapters. The first five chapters contain not only the basics of elementary number theory for the convenience of teaching and continuity of reading, but also many latest research results. The first time in history, the traditional name of the Chinese Remainder Theorem is replaced with the Qin Jiushao Theorem in the book to give him a full credit for his establishment of this famous theorem in number theory. Chapter 6 is about the fascinating congruence modulo an integer power, and Chapter 7 introduces a new problem extracted by the author from the classical problems of number theory, which is out of the combination of additive number theory and multiplicative number theory.One feature of the book is the supplementary material after each section, there by broadening the reader's knowledge and imagination. These contents either discuss the rudiments of some aspects or introduce new problems or conjectures and their extensions, such as perfect number problem, Egyptian fraction problem, Goldbach's conjecture, the twin prime conjecture, the 3x + 1 problem, Hilbert Waring problem, Euler's conjecture, Fermat's Last Theorem, Laudau's problem and etc.This book is written for anyone who loves natural numbers, and it can also be read by mathematics majors, graduate students, and researchers. The book contains many illustrations and tables. Readers can appreciate the author's sensitivity of history, broad range of knowledge, and elegant writing style, while benefiting from the classical works and great achievements of masters in number theory.

This is a self-contained introduction to analytic methods in number theory, assuming on the part of the reader only what is typically learned in a standard undergraduate degree course. It offers to students and those beginning research a systematic and consistent account of the subject but will also be a convenient resource and reference for more experienced mathematicians. These aspects are aided by the inclusion at the end of each chapter a section of bibliographic notes and detailed exercises.

"This book is the first volume of a two-volume textbook for undergraduates and is indeed the crystallization of a course offered by the author at the California Institute of Technology to undergraduates without any previous knowledge of number theory. For this reason, the book starts with the most elementary properties of the natural integers. Nevertheless, the text succeeds in presenting an enormous amount of material in little more than 300 pages."-—MATHEMATICAL REVIEWS

The theory of numbers is generally considered to be the 'purest' branch of pure mathematics and demands exactness of thought and exposition from its devotees. It is also one of the most highly active and engaging areas of mathematics. Now into its eighth edition The Higher Arithmetic introduces the concepts and theorems of number theory in a way that does not require the reader to have an in-depth knowledge of the theory of numbers but also touches upon matters of deep mathematical significance. Since earlier editions, additional material written by J. H. Davenport has been added, on topics such as Wiles' proof of Fermat's Last Theorem, computers and number theory, and primality testing. Written to be accessible to the general reader, with only high school mathematics as prerequisite, this classic book is also ideal for undergraduate courses on number theory, and covers all the necessary material clearly and succinctly.

A Modern Introduction To Classical Number Theory

Right Triangles, Sums of Squares, and Arithmetic

A Pythagorean Introduction to Number Theory

Introduction to Number Theory

This text provides a detailed introduction to number theory, demonstrating how other areas of mathematics enter into the study of the properties of natural numbers. It contains problem sets within each section and at the end of each chapter to reinforce essential concepts, and includes up-to-date information on divisibility problems, polynomial congruence, the sums of squares and trigonometric sums.;Five or more copies may be ordered by college or university bookstores at a special price, available on application.

[illegible]

This is a second edition of Lang's well-known textbook. It covers all of the basic material of classical algebraic number theory, giving the student the background necessary for the study of further topics in algebraic number theory, such as cyclotomic fields, or modular forms. "Lang's books are always of great value for the graduate student and the research mathematician. This updated edition of Algebraic number theory is no exception."—-MATHEMATICAL REVIEWS

One of the oldest branches of mathematics, number theory is a vast field devoted to studying the properties of whole numbers. Offering a flexible format for a one- or two-semester course, Introduction to Number Theory uses worked examples, numerous exercises, and two popular software packages to describe a diverse array of number theory topics. This classroom-tested, student-friendly text covers a wide range of subjects, from the ancient Euclidean algorithm for finding the greatest common divisor of two integers to recent developments that include cryptography, the theory of elliptic curves, and the negative solution of Hilbert's tenth problem. The authors illustrate the connections between number theory and other areas of mathematics, including algebra, analysis, and combinatorics. They also describe applications of number theory to real-world problems, such as congruences in the ISBN system, modular arithmetic and Euler's theorem in RSA encryption, and quadratic residues in the construction of tournaments. The book interweaves the theoretical development of the material with Mathematica® and MapleTM calculations while giving brief tutorials on the software in the appendices. Highlighting both fundamental and advanced topics, this introduction provides all of the tools to achieve a solid foundation in number theory.

A Concise Introduction to the Theory of Numbers

A Friendly Introduction to Number Theory (Classic Version)

An introduction to the theory of numbers

To Number Theory Translated from the Chinese by Peter Shiu With 14 Figures Springer-Verlag Berlin Heidelberg New York 1982 HuaLooKeng Institute of Mathematics Academia Sinica Beijing The People's Republic of China PeterShlu Department of Mathematics University of Technology Loughborough Leicestershire LE 11 3 TU United Kingdom ISBN -13 : 978-3-642-68132-5 e-ISBN -13 : 978-3-642-68130-1 DOl: 10.1007/978-3-642-68130-1 Library of Congress Cataloging in Publication Data. Hua, Loo-Keng, 1910 -. Introduc tion to number theory. Translation of: Shu lun tao yin. Bibliography: p. Includes index. 1. Numbers, Theory of. I. Title. QA241.H7513.5 12'.7.82-645. ISBN-13:978-3-642-68132-5 (U.S.). AACR2 This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically those of translation, reprinting, reuse of illustra tions, broadcasting, reproductiOli by photocopying machine or similar means, and storage in data banks. Under {sect} 54 of the German Copyright Law where copies are made for other than private use a fee is payable to

"Verwertungsgesellschaft Wort", Munich. © Springer-Verlag Berlin Heidelberg 1982 Softcover reprint of the hardcover 1st edition 1982 Typesetting: Buchdruckerei Dipl.-Ing. Schwarz' Erben KG, Zwettl. 214113140-5432 I 0 Preface to the English Edition The reasons for writing this book have already been given in the preface to the original edition and it suffices to append a few more points

Number theory is one of the largest and most popular subject areas in mathematics, and this book is a superb entry to the subject. It features a well-known international author and covers enough material to satisfy both students and the serious researcher. A splendid addition to the marque series of the AMS publishing program.

Undergraduate text uses combinatorial approach to accommodate both math majors and liberal arts students. Covers the basics of number theory, offers an outstanding introduction to partitions, plus chapters on multiplicativity-divisibility, quadratic congruences, additivity, and more

Many of the important and creative developments in modern mathematics resulted from attempts to solve questions that originate in number theory. The publication of Emil Grosswald's classic text presents an illuminating introduction to number theory. Combining the historical developments with the analytical approach, Topics from the Theory of Numbers offers the reader a diverse range of subjects to investigate.

A Classical Introduction to Modern Number Theory

An Introduction to Number Theory with Cryptography

An Introduction to Pure and Applied Mathematics

An Illustrated Theory of Numbers

This book presents material suitable for an undergraduate course in elementary number theory from a computational perspective. It seeks to not only introduce students to the standard topics in elementary number theory, such as prime factorization and modular arithmetic, but also to develop their ability to formulate and test precise conjectures from experimental data. Each topic is motivated by a question to be answered, followed by some experimental data, and, finally, the statement and proof of a theorem. There are numerous opportunities throughout the chapters and exercises for the students to engage in (guided) open-ended exploration. At the end of a course using this book, the students will understand how mathematics is developed from asking questions to gathering data to formulating and proving theorems. The mathematical prerequisites for this book are few. Early chapters contain topics such as integer divisibility, modular arithmetic, and applications to cryptography, while later chapters contain more specialized topics, such as Diophantine approximation, number theory of dynamical systems, and number theory with polynomials. Students of all levels will be drawn in by the patterns and relationships of number theory uncovered through data driven exploration.

Number Theory is a newly translated and revised edition of the most popular introductory textbook on the subject in Hungary. The book covers the usual topics of introductory number theory: divisibility, primes, Diophantine equations, arithmetic functions, and so on. It also introduces several more advanced topics including congruences of higher degree, algebraic number theory, combinatorial number theory, primality testing, and cryptography. The development is carefully laid out with ample illustrative examples and a treasure trove of beautiful and challenging problems. The exposition is both clear and precise. The book is suitable for both graduate and undergraduate courses with enough material to fill two or more semesters and could be used as a source for independent study and capstone projects. Freud and Gyarmati are well-known mathematicians and mathematical educators in Hungary, and the Hungarian version of this book is legendary there. The authors' personal pedagogical style as a facet of the rich Hungarian tradition shines clearly through. It will inspire and exhilarate readers.

Number Theory is more than a comprehensive treatment of the subject. It is an introduction to topics in higher level mathematics, and unique in its scope; topics from analysis, modern algebra, and discrete mathematics are all included. The book is divided into two parts. Part A covers key concepts of number theory and could serve as a first course on the subject. Part B delves into more advanced topics and an exploration of related mathematics. The prerequisites for this self-contained text are elements from linear algebra. Valuable references for the reader are collected at the end of each chapter. It is suitable as an introduction to higher level mathematics for undergraduates, or for self-study.

This accessible Third Edition incorporates especially complete & detailed arguments, illustrating definitions, theorems, & subtleties of proof with explicit numerical examples whenever possible.

An Introduction to Number Theory

Algebraic Number Theory

Introduction to Analytic Number Theory

Number Theory and Geometry: An Introduction to Arithmetic Geometry

The sixth edition of the classic undergraduate text in elementary number theory includes a new chapter on elliptic curves and their role in the proof of Fermat's Last Theorem, a foreword by Andrew Wiles and extensively revised and updated end-of-chapter notes.

Right triangles are at the heart of this textbook's vibrant new approach to elementary number theory. Inspired by the familiar Pythagorean theorem, the author invites the reader to ask natural arithmetic questions about right triangles, then proceeds to develop the theory needed to respond. Throughout, students are encouraged to engage with the material by posing questions, working through exercises, using technology, and learning about the broader context in which ideas developed. Progressing from the fundamentals of number theory through to Gauss sums and quadratic reciprocity, the first part of this text presents an innovative first course in elementary number theory. The advanced topics that follow, such as counting lattice points and the four squares theorem, offer a variety of options for extension, or a higher-level course; the breadth and modularity of the later material is ideal for creating a senior capstone course. Numerous exercises are included throughout, many of which are designed for SageMath. By involving students in the active process of inquiry and investigation, this textbook imbues the foundations of number theory with insights into the lively mathematical process that continues to advance the field today. Experience writing proofs is the only formal prerequisite for the book, while a background in basic real analysis will enrich the reader's appreciation of the final chapters.

Originally published in 2013, reissued as part of Pearson's modern classic series.