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An Introduction To Diophantine Equations A Problem Based Approach

Introduction to Diophantine equations Introduction to Diophantine Equations Intro to Diophantine Equations N1--Introduction to Linear Diophantine Equations Elliptic Curves - Lecture 1 - Introduction to diophantine equations Diophantine Equations with 1 Variable ← Number Theory ← Socratica Linear diophantine equation:Modular arithematic approach Diophantine Equation: ax+by=gcd(a,b) ← Number Theory A Complete Guide To Solving Linear Diophantine Equations - Part One Diophantine Equations: Strategies and Examples What is Diophantine equation?, Explain Diophantine equation, Define Diophantine equation Solving Linear Diophantine Equations - Simplified A Nice Diophantine Equation in Number Theory | You Should Learn This Theorem | Math Olympiad Delightful Diophantine Equations - Mastering AMC 8 Putnam Exam | 2018: A1 MEI FPT: Number Theory 4 - Diophantine equations: Introducing Diophantine equations Diophantine Equations (Part I): Intro and Checking feasibility A Naïve Introduction to Trans-Elliptic Diophantine Equations 9 24 Number Theory Intro to Linear Diophantine equations Number Theory: Introduction to Linear Diophantine Equations
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COLBY HALLIE

Structures, Examples, and Problems

Springer Science & Business Media
An Introduction to Diophantine EquationsA Problem-Based ApproachBirkhäuser
Diophantine Geometry Springer Science & Business Media
Diophantine number theory is an active area that has seen tremendous growth over the past century, and in this theory unit equations play a central role. This comprehensive treatment is the first volume devoted to these equations. The authors gather together all the most important results and look at many different aspects, including effective results on unit equations over number fields, estimates on the number of solutions, analogues for function fields and effective results for unit equations over finitely generated domains. They also present a variety of applications. Introductory chapters provide the necessary background in algebraic number theory and function field theory, as well as an account of the required tools from Diophantine approximation and transcendence theory. This makes the book suitable for young researchers as well as experts who are looking for an up-to-date overview of the field.

Logical Number Theory I

World Scientific
This book tells the story of Diophantine analysis, a subject that, owing to its thematic proximity to algebraic geometry, became fashionable in the last half century and has remained so ever since. This new treatment of the methods of Diophantus--a person whose very existence has long been doubted by most historians of mathematics--will be accessible to readers who have taken some university mathematics. It includes the elementary facts of algebraic geometry indispensable for its understanding. The heart of the book is a fascinating account of the development of Diophantine methods during the.
Number Theory The Trillia Group
Number Theory Revealed: A Masterclass acquaints enthusiastic students 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 and modern twists on traditional questions like the values represented by binary quadratic forms, the anatomy of integers, and elliptic curves. This Masterclass edition contains many additional chapters and appendices not found in Number Theory Revealed: An Introduction, highlighting beautiful developments and inspiring other subjects in mathematics (like algebra). This allows instructors to tailor a course suited to their own (and their students') interests. There are new yet accessible topics like the curvature of circles in a tiling of a circle by circles, the latest discoveries on gaps between primes, a new proof of Mordell's Theorem for congruent elliptic curves, and a discussion of the abc-conjecture including its proof for polynomials. About the Author: Andrew Granville is the Canada Research Chair in Number Theory at the University of Montreal and professor of mathematics at University College London. He has won several international writing prizes for exposition in mathematics, including the 2008 Chauvenet Prize and the 2019 Halmos-Ford Prize, and is the author of Prime Suspects (Princeton University Press, 2019), a beautifully illustrated graphic novel murder mystery that explores surprising connections between the anatomies of integers and of permutations.

An Introduction

Springer Science & Business Media
This is an introduction to diophantine geometry at the advanced graduate level. The book contains a proof of the Mordell conjecture which will make it quite attractive to graduate students and professional mathematicians. In each part of the book, the reader will find numerous exercises.
Classical Diophantine Equations American Mathematical Society
This problem-solving book is an introduction to the study of Diophantine equations, a class of equations in which only integer solutions are allowed. The presentation features some classical Diophantine equations, including linear, Pythagorean, and some higher degree equations, as well as exponential Diophantine equations. Many of the selected exercises and problems are original or are presented with original solutions. An Introduction to Diophantine Equations: A Problem-Based Approach is intended for undergraduates, advanced high school students and teachers, mathematical contest participants — including Olympiad and Putnam competitors — as well as readers interested in essential mathematics. The work uniquely presents unconventional and non-routine examples, ideas, and techniques.

Diophantine Approximations

Springer
This self-contained treatment covers approximation of irrationals by rationals, product of linear forms, multiples of an irrational number, approximation of complex numbers, and product of complex linear forms. 1963 edition.
Quadratic Diophantine Equations Springer
Hilbert's tenth problem is one of 23 problems proposed by David Hilbert in 1900 at the International Congress of Mathematicians in Paris. These problems gave focus for the exponential development of mathematical thought over the following century. The tenth problem asked for a general algorithm to determine if a given Diophantine equation has a solution in integers. It was finally resolved in a series of papers written by Julia Robinson, Martin Davis, Hilary Putnam, and finally Yuri Matiyasevich in 1970. They showed that no such algorithm exists. This book is an exposition of this remarkable achievement. Often, the solution to a famous problem involves formidable background. Surprisingly, the solution of Hilbert's tenth problem does not. What is needed is only some elementary number theory and rudimentary logic. In this book, the authors present the complete proof along with the romantic history that goes with it. Along the way, the reader is introduced to Cantor's transfinite numbers, axiomatic set theory, Turing machines, and Gödel's incompleteness theorems. Copious exercises are included at the end of each chapter to guide the student gently on this ascent. For the advanced student, the final chapter highlights recent developments and suggests future directions. The book is suitable for undergraduates and graduate students. It is essentially self-contained.

An Introduction to Diophantine Equations

Birkhäuser
This book presents in a unified and concrete way the beautiful and deep mathematics - both theoretical and computational - on which the explicit solution of an elliptic Diophantine equation is based. It collects numerous results and methods that are scattered in the literature. Some results are hidden behind a number of routines in software packages, like Magma and Maple; professional

mathematicians very often use these routines just as a black-box, having little idea about the mathematical treasure behind them. Almost 20 years have passed since the first publications on the explicit solution of elliptic Diophantine equations with the use of elliptic logarithms. The "art" of solving this type of equation has now reached its full maturity. The author is one of the main persons that contributed to the development of this art. The monograph presents a well-balanced combination of a variety of theoretical tools (from Diophantine geometry, algebraic number theory, theory of linear forms in logarithms of various forms - real/complex and p-adic elliptic - and classical complex analysis), clever computational methods and techniques (LLL algorithm and de Weger's reduction technique, AGM algorithm, Zagier's technique for computing elliptic integrals), ready-to-use computer packages. A result is the solution in practice of a large general class of Diophantine equations.

An Introduction to the Theory of Numbers Springer Science & Business Media

This text treats the classical theory of quadratic diophantine equations and guides the reader through the last two decades of computational techniques and progress in the area. The presentation features two basic methods to investigate and motivate the study of quadratic diophantine equations: the theories of continued fractions and quadratic fields. It also discusses Pell’s equation and its generalizations, and presents some important quadratic diophantine equations and applications. The inclusion of examples makes this book useful for both research and classroom settings.

Geometric Problems on Maxima and Minima Cambridge University Press

This is a integrated presentation of the theory of exponential diophantine equations. The authors present, in a clear and unified fashion, applications to exponential diophantine equations and linear recurrence sequences of the Gelfond-Baker theory of linear forms in logarithms of algebraic numbers. Topics covered include the Thue equations, the generalised hyperelliptic equation, and the Fermat and Catalan equations. The necessary preliminaries are given in the first three chapters. Each chapter ends with a section giving details of related results.

An Introduction to Diophantine Equations Springer Science & Business Media

This problem-solving book is an introduction to the study of Diophantine equations, a class of equations in which only integer solutions are allowed. The presentation features some classical Diophantine equations, including linear, Pythagorean, and some higher degree equations, as well as exponential Diophantine equations. Many of the selected exercises and problems are original or are presented with original solutions. An Introduction to Diophantine Equations: A Problem-Based Approach is intended for undergraduates, advanced high school students and teachers, mathematical contest participants — including Olympiad and Putnam competitors — as well as readers interested in essential mathematics. The work uniquely presents unconventional and non-routine examples, ideas, and techniques.

Elliptic Diophantine Equations Springer Science & Business Media

The first thing you will find out about this book is that it is fun to read. It is meant for the browser, as well as for the student and for the specialist wanting to know about the area. The footnotes give an historical background to the text, in addition to providing deeper applications of the concept that is being cited. This allows the browser to look more deeply into the history or to pursue a given sideline. Those who are only marginally interested in the area will be able to read the text, pick up information easily, and be entertained at the same time by the historical and philosophical digressions. It is rich in structure and motivation in its concentration upon quadratic orders. This is not a book that is primarily about tables, although there are 80 pages of appendices that contain extensive tabular material (class numbers of real and complex quadratic fields up to 104; class group structures; fundamental units of real quadratic fields; and more!). This book is primarily a reference book and graduate student text with more than 200 exercises and a great deal of hints! The motivation for the text is best given by a quote from the Preface of Quadratics: "There can be no stronger motivation in mathematical inquiry than the search for truth and beauty. It is this author's long-standing conviction that number theory has the best of both of these worlds. In particular, algebraic and computational number theory have reached a stage where the current state of affairs richly deserves a proper elucidation. It is this author's goal to attempt to shine the best possible light on the subject."

Number Theory American Mathematical Soc.

The 13 chapters of this book centre around the proof of Theorem 1 of Faltings' paper "Diophantine approximation on abelian varieties", Ann. Math.133 (1991) and together give an approach to the proof that is accessible to Ph.D-level students in number theory and algebraic geometry. Each chapter is based on an instructional lecture given by its author ata special conference for graduate students, on the topic of Faltings' paper.

A Concrete Approach via the Elliptic Logarithm American Mathematical Soc.

This introductory textbook takes a problem-solving approach to number theory, situating each concept within the framework of an example or a problem for solving. Starting with the essentials, the text covers divisibility, unique factorization, modular arithmetic and the Chinese Remainder Theorem, Diophantine equations, binomial coefficients, Fermat and Mersenne primes and other special numbers, and special sequences. Included are sections on mathematical induction and the pigeonhole principle, as well as a discussion of other number systems. By emphasizing examples and applications the authors motivate and engage readers.

An Introduction to Number Theory

Courier Corporation

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.

An Experimental Introduction to Number Theory Cambridge University Press

This problem-solving book is an introduction to the study of Diophantine equations, a class of equations in which only integer solutions are allowed. The presentation features some classical Diophantine equations, including linear, Pythagorean, and some higher degree equations, as well as exponential Diophantine equations. Many of the selected exercises and problems are original or are presented with original solutions. An Introduction to Diophantine Equations: A Problem-Based Approach is intended for undergraduates, advanced high school students and teachers, mathematical contest participants — including Olympiad and Putnam competitors — as well as readers interested in essential mathematics. The work uniquely presents unconventional and non-routine examples, ideas, and techniques.

Quadratics American Mathematical Soc.

A coherent account of the computational methods used to solve diophantine equations.

An Introduction to Diophantine Equations for Control Theory Springer

This book is intended to be an introduction to Diophantine geometry. The central theme of the book is to investigate the distribution of integral points on algebraic varieties. This text rapidly introduces problems in Diophantine geometry, especially those involving integral points, assuming a geometrical perspective. It presents recent results not available in textbooks and also new viewpoints on classical material. In some instances, proofs have been replaced by a detailed analysis of particular cases, referring to the quoted papers for complete proofs. A central role is played by Siegel’s finiteness theorem for integral points on curves. The book ends with the analysis of integral points on surfaces.

A Problem-Based Approach Cambridge University Press

This undergraduate textbook provides an elegant introduction to the arithmetic of quadratic number fields, including many topics not usually covered in books at this level. Quadratic fields offer an introduction to algebraic number theory and some of its central objects: rings of integers, the unit group, ideals and the ideal class group. This textbook provides solid grounding for further study by placing the subject within the greater context of modern algebraic number theory. Going beyond what is usually covered at this level, the book introduces the notion of modularity in the context of quadratic reciprocity, explores the close links between number theory and geometry via Pell conics, and presents applications to Diophantine equations such as the Fermat and Catalan equations as well as elliptic curves. Throughout, the book contains extensive historical comments, numerous exercises (with solutions), and pointers to further study. Assuming a moderate background in elementary number theory and abstract algebra, Quadratic Number Fields offers an engaging first course in algebraic number theory, suitable for upper undergraduate students.