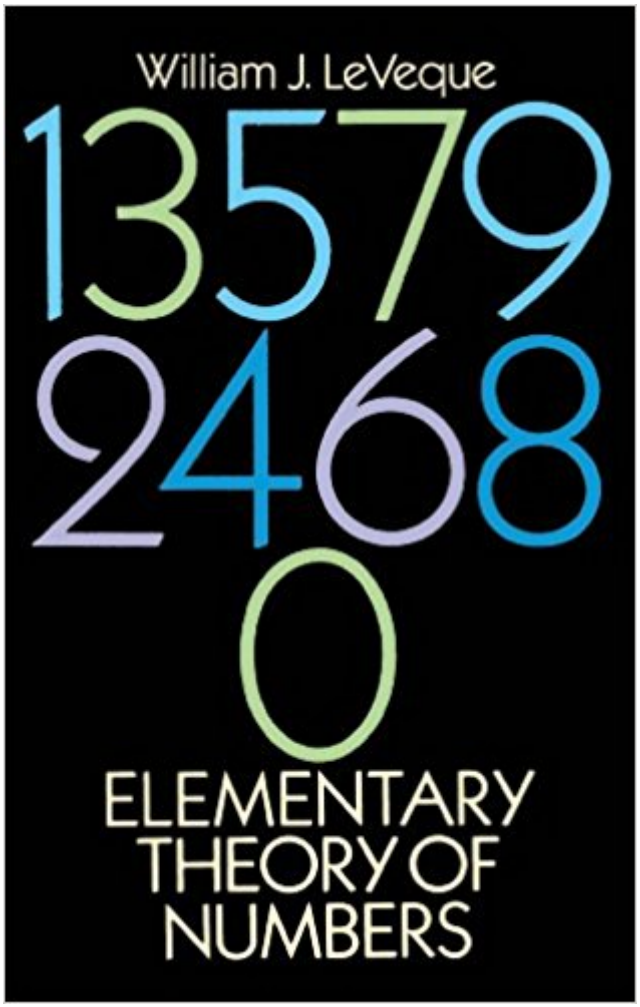
Elementary Theory Of Numbers (Dover Books On Mathematics)



Synopsis

This superb text introduces number theory to readers with limited formal mathematical training. Intended for use in freshman- and sophomore-level courses in arts and science curricula, in teacher-training programs, and in enrichment programs for high-school students, it is filled with simple problems to stimulate readers' interest, challenge their abilities and increase mathematical strength.Contents:I. IntroductionII. The Euclidean Algorithm and Its ConsequencesIII. CongruencesIV. The Powers of an Integer Modulo mV. Continued FractionsVI. The Gaussian IntegersVII. Diophantine EquationsRequiring only a sound background in high-school mathematics, this work offers the student an excellent introduction to a branch of mathematics that has been a strong influence in the development of higher pure mathematics, both in stimulating the creation of powerful general methods in the course of solving special problems (such as Fermat conjecture and the prime number theorem) and as a source of ideas and inspiration comparable to geometry and the mathematics of physical phenomena.

Book Information

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Customer Reviews

I have only read one chapter. It is not for people with little or no background in Mathematics.

Fairly basic introduction. Very easy to read. The level of abstraction is low, so this is accessible to anyone with a high school math background. But it omits a number of important topics, and is not really appropriate for a college level number theory course. It does however, provide a nice introduction to topics a bit more abstract that most high school math.

Brief but excellent and quite comprehensive.

fun

This book is approachable for someone with no background in number theory. It also serves as a great resource for questions.

As others have said, this is a fairly easy read. For me it’s actually fun and I’m working through it for that reason. But:- I don’t normally use a highlighter, but found it necessary to highlight symbols where they were defined, because some of them come up only once in a while and it’s easy to forget where the definition is. Symbols are not indexed. I have started my own symbol index in the back of the book.- There are some annoying errors. The theorem to be proven in section 1-3, problem 2 is false for n=1. The decimal expansions in the chapter on continued fractions (page 75) are wrong (for example 1.273820... should actually be 1.273239...). It seems to me if you’re going to give 7 digits they should be the right 7 digits.On the other hand, these errors don’t affect the overall flow of the text, and I’m having a great time working through this book on my own. I’ve read through the whole thing over the summer, and I’m going back through doing problems and writing programs. I was a math major 40 years ago, and haven’t done much with it since, to give a context for that remark.

William J. LeVeque’s short book (120 pages), Elementary Theory of Numbers, is quite satisfactory as a self-tutorial text. It should appeal to math majors new to number theory as well as others that enjoy studying mathematics.Chapter 1 introduces proofs by induction (in various forms), proofs by contradiction, and the radix representation of integers that often proves more useful than the familiar decimal system for theoretical purposes.Chapter 2 derives the Euclidian algorithm, the cornerstone of multiplicative number theory, as well as the unique factorization theorem and the theorem of the

least common multiple. Speaking from experience, I recommend that you take the time necessary to master Chapter 2, not just because these basic proofs are important, but more critically to reinforce the skills and discipline necessary for the subsequent chapters.Two integers a and b are congruent for the modulus m when their difference a-b is divisible by the integer m. In chapter 3 this seemingly simple concept, introduced by Gauss, leads to topics like residue classes and arithmetic (mod m), linear congruences, polynomial congruences, and quadratic congruences with prime modulus. The short chapter 4 was devoted to the powers of an integer, modulo m.Continued fractions, the subject of chapter 5, was not unfamiliar and yet, as with congruences, I quickly found myself enmeshed in complexity, wrestling with basic identities, the continued fraction expansion of a rational number, the expansion of an irrational number, the expansion of quadratic identities, and approximation theorems.I have yet to tackle the last two chapters, the Gaussian integers and Diophantine equations, but my expectation is that both topics will also require substantial effort and time. LeVeque’s Elementary Theory of Numbers is not an elementary text, nor a basic introduction to number theory. Nonetheless, it is not out of reach of non-mathematics majors, but it will require a degree of dedication and persistence.For a reader new to number theory, LeVeque may be too much too soon. I suggest first reading Excursions in Number Theory by C. Stanley Ogilvy and John T. Anderson, another Dover reprint. It is quite good.Some caution: LeVeque emphasizes that many theorems are easy to understand, and yet this very simplicity is a two-edged sword. Simple theorems often provide no clues, no hints, on how to proceed. Discovering a short and elegant proof is often far from easy. LeVeque also stresses that a technique ceases to be a trick and becomes a method only when it has been encountered enough times to seem natural. A reader new to number theory may initially be overwhelmed by the variety of techniques used.A nit: The Dover edition of LeVeque’s Elementary Theory of Numbers would benefit from a larger font size. I occasionally found myself squinting to read tiny subscripts and superscripts.

Very good book. First to comment on the fact that LeVeque has 2 dover books that cover basically the same topics (this one, and Fundamentals of Number Theory). I have looked at both, and this one is the better of the two. The other one uses slightly different definitions that have an Abstract Algebra twist to it. But the other book still doesn’t use the power of abstract algebra so the different/akward definitions and explanations just make it hard to read.An elementary number theory book should use elementary definitions and concepts (abstract algebra is meant for ALGEBRAIC number theory books). So avoid his other book, which is good, but not as easy to read as this one.This book is very easy to read and concepts are introdced very clearly. Things come in small

chunks which are easily digested. The thing about this book is, you can go through it faster than normal textbooks but you still end up learning everything you would by going slowing through hard-to-read texts (not like The Higher Arithmetic by Davenport, that book can lull you into reading it like a story book, but you end up learning nothing).

Elementary Theory of Numbers (Dover Books on Mathematics) Elementary Number Theory: Second Edition (Dover Books on Mathematics) 2nd (second) Edition by Underwood Dudley published by Dover Publications (2008) One Hundred Problems in Elementary Mathematics (Dover Books on Mathematics) Contributions to the Founding of the Theory of Transfinite Numbers (Dover Books on Mathematics) Elementary Number Theory: Second Edition (Dover Books on Mathematics) The Whole Truth About Whole Numbers: An Elementary Introduction to Number Theory Discrete Mathematics: Elementary and Beyond (Undergraduate Texts in Mathematics) Elementary and Middle School Mathematics: Teaching Developmentally (8th Edition) (Teaching Student-Centered Mathematics Series) Bundle: Cengage Advantage Books: Elementary and Intermediate Algebra, 5th + WebAssign Printed Access Card for Tussy/Gustafson's Elementary and Intermediate Algebra, 5th Edition, Single-Term READING ORDER: TAMI HOAG: BOOKS LIST OF THE BITTER SEASON, KOVAC/LISKA BOOKS, HENNESSY BOOKS, QUAID HORSES, DOUCET BOOKS, DEER LAKE BOOKS, ELENA ESTES BOOKS, OAK KNOLL BOOKS BY TAMI HOAG Elementary Number Theory: Primes, Congruences, and Secrets: A Computational Approach (Undergraduate Texts in Mathematics) Elementary Analysis: The Theory of Calculus (Undergraduate Texts in Mathematics) Sacred Science of Numbers: A Series of Lecture Lessons Dealing with the Sacred Science of Numbers The Grapes of Math: How Life Reflects Numbers and Numbers Reflect Life Numbers Raging (Numbers Game Saga Book 3) Numbers Ignite (Numbers Game Saga Book 2) Mathematics and the Imagination (Dover Books on Mathematics) Mathematics for Quantum Mechanics: An Introductory Survey of Operators, Eigenvalues, and Linear Vector Spaces (Dover Books on Mathematics) The Nature and Power of Mathematics (Dover Books on Mathematics) Mathematics for the Nonmathematician (Dover Books on Mathematics)