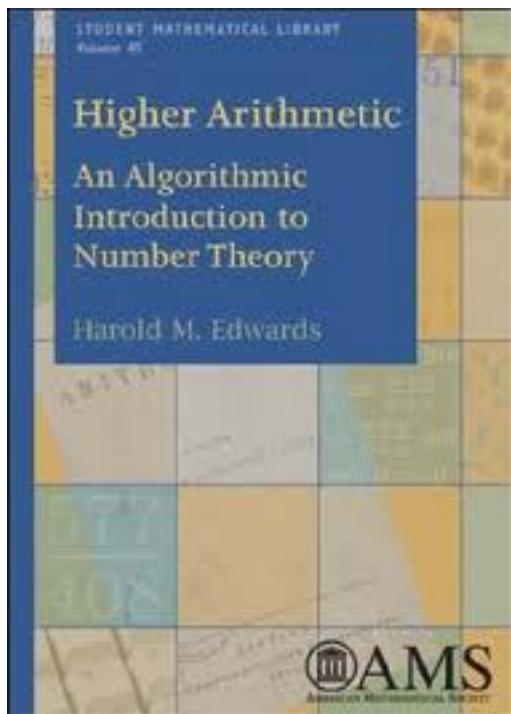


Higher Arithmetic



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出版者:American Mathematical Society

出版时间:2008-3-26

装帧:Paperback

isbn:9780821844397

Although number theorists have sometimes shunned and even disparaged computation in the past, today's applications of number theory to cryptography and computer security demand vast arithmetical computations. These demands have shifted the focus of studies in number theory and have changed attitudes toward computation itself.

The important new applications have attracted a great many students to number theory, but the best reason for studying the subject remains what it was when Gauss published his classic *Disquisitiones Arithmeticae* in 1801: Number theory is the equal of

Euclidean geometry—some would say it is superior to Euclidean geometry—as a model of pure, logical, deductive thinking. An arithmetical computation, after all, is the purest form of deductive argument.

Higher Arithmetic explains number theory in a way that gives deductive reasoning, including algorithms and computations, the central role. Hands-on experience with the application of algorithms to computational examples enables students to master the fundamental ideas of basic number theory. This is a worthwhile goal for any student of mathematics and an essential one for students interested in the modern applications of number theory.

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Harold M. Edwards is Emeritus Professor of Mathematics at New York University. His previous books are Advanced Calculus (1969, 1980, 1993), Riemann's Zeta Function (1974, 2001), Fermat's Last Theorem (1977), Galois Theory (1984), Divisor Theory (1990), Linear Algebra (1995), and Essays in Constructive Mathematics (2005). For his masterly mathematical exposition he was awarded a Steele Prize as well as a Whiteman Prize by the American Mathematical Society.

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