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Titolo	A journey through the realm of numbers : from quadratic equations to quadratic reciprocity // Menny Aka, Manfred Einsiedler, and Thomas Ward
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ISBN	3-030-55233-0
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (XIX, 344 p.)
Collana	SUMS Readings, , 2730-5813
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Lingua di pubblicazione	Inglese
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	1 Introduction: Polynomial Equations -- 2 Cantor's Paradise -- 3 Sums of Squares -- 4 Sums of Two Squares -- 5 Abstract Algebra: Ring Theory -- 6 Cubic and Quartic Diophantine Equations -- 7 The Structure of the Group $F_p$ -- 8 Studying Squares Again -- Hints to Selected Exercises -- References and further reading -- Index.
Sommario/riassunto	This book takes the reader on a journey from familiar high school mathematics to undergraduate algebra and number theory. The journey starts with the basic idea that new number systems arise from solving different equations, leading to (abstract) algebra. Along this journey, the reader will be exposed to important ideas of mathematics, and will learn a little about how mathematics is really done. Starting at an elementary level, the book gradually eases the reader into the complexities of higher mathematics; in particular, the formal structure of mathematical writing (definitions, theorems and proofs) is introduced in simple terms. The book covers a range of topics, from the very foundations (numbers, set theory) to basic abstract algebra (groups, rings, fields), driven throughout by the need to understand concrete equations and problems, such as determining which numbers are sums of squares. Some topics usually reserved for a more advanced audience, such as Eisenstein integers or quadratic reciprocity, are lucidly presented in an accessible way. The book also introduces the

reader to open source software for computations, to enhance understanding of the material and nurture basic programming skills. For the more adventurous, a number of Outlooks included in the text offer a glimpse of possible mathematical excursions. This book supports readers in transition from high school to university mathematics, and will also benefit university students keen to explore the beginnings of algebraic number theory. It can be read either on its own or as a supporting text for first courses in algebra or number theory, and can also be used for a topics course on Diophantine equations.

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