

1. Record Nr.	UNINA9910823189203321
Autore	Niven Ivan <1915-1999.>
Titolo	Numbers : rational and irrational / / by Ivan Niven
Pubbl/distr/stampa	Washington, DC, : Mathematical Association of America, 1961
ISBN	0-88385-919-X
Edizione	[1st ed.]
Descrizione fisica	1 online resource (viii, 140 pages) : digital, PDF file(s)
Collana	Anneli Lax New Mathematical Library ; ; 1
Disciplina	512.81
Soggetti	Numbers, Real Numbers, Complex
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Front Cover -- Numbers: Rational and Irrational -- Copyright Page -- CONTENTS -- Introduction -- Chapter 1. Natural Numbers and Integers -- 1.1 Primes -- 1.2 Unique Factorization -- 1.3 Integers -- 1.4 Even and Odd Integers -- 1.5 Closure Properties -- 1.6 A Remark on the Nature of Proof -- Chapter 2. Rational Numbers -- 2.1 Definition of Rational Numbers -- 2.2 Terminating and Non-terminating Decimals -- 2.3 The Many Ways of Stating and Proving Propositions -- 2.4 Periodic Decimals -- 2.5 Terminating Decimals Written as Periodic Decimals -- 2.6 A Summary -- Chapter 3. Real Numbers -- 3.1 The Geometric Viewpoint -- 3.2 Decimal Representations -- 3.3 The Irrationality of 2 -- 3.4 The Irrationality of 3 -- 3.5 The Irrationality of $\sqrt{6}$ and $\sqrt{2} + 3$ -- 3.6 The Words We Use -- 3.7 An Application to Geometry -- 3.8 A summary -- Chapter 4. Irrational Numbers -- 4.1 Closure Properties -- 4.2 Polynomial Equations -- 4.3 Rational Roots of Polynomial Equations -- 4.4 Further Examples -- 4.5 A Summary -- Chapter 5. Trigonometric and Logarithmic Numbers -- 5.1 Irrational Values of Trigonometric Functions -- 5.2 A Chain Device -- 5.3 Irrational Values of Common Logarithms -- 5.4 Transcendental Numbers -- 5.5 Three Famous Construction Problems -- 5.6 Further Analysis of 32 -- 5.7 A Summary -- Chapter 6. The Approximation of Irrationals by Rationals -- 6.1 Inequalities -- 6.2 Approximation by Integers -- 6.3 Approximation by Rationals -- 6.4 Better Approximations -- 6.5 Approximations to within $1/n^2$ -- 6.6 Limitations on Approximations -- 6.7 A Summary -- Chapter 7. The

Existence of Transcendental Numbers -- 7.1 Some Algebraic Preliminaries -- 7.2 An Approximation to -- 7.3 The Plan of the Proof -- 7.4 Properties of Polynomials -- 7.5 The Transcendence of -- 7.6 A Summary -- Appendix A Proof That There Are Infinitely Many Prime Numbers.
Appendix B Proof of the Fundamental Theorem of Arithmetic --
Appendix C Cantor's Proof of the Existence of Transcendental Numbers -- Appendix D Trigonometric Numbers -- Answers and Suggestions to Selected Problems -- Index.

Sommario/riassunto

A superb development that starts with the natural numbers and carries the reader through the rationals and their decimal representations to algebraic numbers and then to the real numbers. Along the way, you will see characterizations of the rationals and of certain special (Liouville) transcendental numbers. This material is basic to all of algebra and analysis. Professor Niven's book may be read with profit by interested high school students as well as by college students and others who want to know more about the basic aspects of pure mathematics.
