

1. Record Nr.	UNINA9910973854003321
Autore	Protter Murray H.
Titolo	A First Course in Real Analysis / / by Murray H. Protter, Charles B. Jr. Morrey
Pubbl/distr/stampa	New York, NY : , : Springer New York : , : Imprint : Springer, , 1991
ISBN	1-4419-8744-4
Edizione	[2nd ed. 1991.]
Descrizione fisica	1 online resource (xviii, 536 pages)
Collana	Undergraduate Texts in Mathematics, , 2197-5604
Disciplina	515.8
Soggetti	Functions of real variables Real Functions
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	1 The Real Number System -- 1.1 Axioms for a Field -- 1.2 Natural Numbers and Sequences -- 1.3 Inequalities -- 1.4 Mathematical Induction -- 2 Continuity And Limits -- 2.1 Continuity -- 2.2 Limits -- 2.3 One-Sided Limits -- 2.4 Limits at Infinity; Infinite Limits -- 2.5 Limits of Sequences -- 3 Basic Properties of Functions on $\mathbb{R}$ -- 3.1 The Intermediate-Value Theorem -- 3.2 Least Upper Bound; Greatest Lower Bound -- 3.3 The Bolzano—Weierstrass Theorem -- 3.4 The Boundedness and Extreme-Value Theorems -- 3.5 Uniform Continuity -- 3.6 The Cauchy Criterion -- 3.7 The Heine-Borel and Lebesgue Theorems -- 4 Elementary Theory of Differentiation -- 4.1 The Derivative in $\mathbb{R}$ -- 4.2 Inverse Functions in $\mathbb{R}$ -- 5 Elementary Theory of Integration -- 5.1 The Darboux Integral for Functions on $\mathbb{R}$ -- 5.2 The Riemann Integral -- 5.3 The Logarithm and Exponential Functions -- 5.4 Jordan Content and Area -- 6 Elementary Theory of Metric Spaces -- 6.1 The Schwarz and Triangle Inequalities; Metric Spaces -- 6.2 Elements of Point Set Topology -- 6.3 Countable and Uncountable Sets -- 6.4 Compact Sets and the Heine—Borel Theorem -- 6.5 Functions on Compact Sets -- 6.6 Connected Sets -- 6.7 Mappings from One Metric Space to Another -- 7 Differentiation in $\mathbb{R}^n$ -- 7.1 Partial Derivatives and the Chain Rule -- 7.2 Taylor's Theorem; Maxima and Minima 178 -- 7.3 The Derivative in $\mathbb{R}^n$ -- 8 Integration in $\mathbb{R}^n$ -- 8.1 Volume in $\mathbb{R}^n$ -- 8.2 The Darboux Integral in $\mathbb{R}^n$ -- 8.3 The Riemann Integral in $\mathbb{R}^n$ -- 9 Infinite Sequences and Infinite Series -- 9.1

Tests for Convergence and Divergence -- 9.2 Series of Positive and Negative Terms; Power Series -- 9.3 Uniform Convergence of Sequences -- 9.4 Uniform Convergence of Series; Power Series -- 9.5 Unordered Sums -- 9.6 The Comparison Test for Unordered Sums; Uniform Convergence -- 9.7 Multiple Sequences and Series -- 10 Fourier Series -- 10.1 Expansions of Periodic Functions -- 10.2 Sine Series and Cosine Series; Change of Interval -- 10.3 Convergence Theorems -- 11 Functions Defined by Integrals; Improper Integrals -- 11.1 The Derivative of a Function Defined by an Integral; the Leibniz Rule -- 11.2 Convergence and Divergence of Improper Integrals -- 11.3 The Derivative of Functions Defined by Improper Integrals; the Gamma Function -- 12 The Riemann—Stieltjes Integral and Functions of Bounded Variation -- 12.1 Functions of Bounded Variation -- 12.2 The Riemann—Stieltjes Integral -- 13 Contraction Mappings, Newton's Method, and Differential Equations -- 13.1 A Fixed Point Theorem and Newton's Method -- 13.2 Application of the Fixed Point Theorem to Differential Equations -- 14 Implicit Function Theorems and Lagrange Multipliers -- 14.1 The Implicit Function Theorem for a Single Equation -- 14.2 The Implicit Function Theorem for Systems -- 14.3 Change of Variables in a Multiple Integral -- 14.4 The Lagrange Multiplier Rule -- 15 Functions on Metric Spaces; Approximation -- 15.1 Complete Metric Spaces -- 15.2 Convex Sets and Convex Functions -- 15.3 Arzela's Theorem; the Tietze Extension Theorem -- 15.4 Approximations and the Stone—Weierstrass Theorem -- 16 Vector Field Theory; the Theorems of Green and Stokes -- 16.1 Vector Functions on $\mathbb{R}^1$ -- 16.2 Vector Functions and Fields on $\mathbb{R}^N$ -- 16.3 Line Integrals in $\mathbb{R}^N$ -- 16.4 Green's Theorem in the Plane -- 16.5 Surfaces in $\mathbb{R}^3$; Parametric Representation -- 16.6 Area of a Surface in $\mathbb{R}^3$; Surface Integrals -- 16.7 Orientable Surfaces -- 16.8 The Stokes Theorem -- 16.9 The Divergence Theorem -- Appendixes -- Appendix 1 Absolute Value -- Appendix 2 Solution of Algebraic Inequalities -- Appendix 3 Expansions of Real Numbers in Any Base -- Answers to Odd-Numbered Problems.

Sommario/riassunto

Many changes have been made in this second edition of A First Course in Real Analysis. The most noticeable is the addition of many problems and the inclusion of answers to most of the odd-numbered exercises. The book's readability has also been improved by the further clarification of many of the proofs, additional explanatory remarks, and clearer notation.