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Nota di contenuto	Theorems, Corollaries, Lemmas, and Methods of Proof; Contents; Preface; Chapter 1 - Introduction to Modern Mathematics; 1.1 Inductive and Deductive Reasoning; 1.2 Components of Modern Mathematics; 1.3 Commonly Used Mathematical Notation; EXERCISES; Chapter 2 - An Introduction to Symbolic Logic; 2.1 Statements and Propositional Functions; 2.2 Combining Statements; 2.3 Truth Tables; 2.4 Conditional Statements; 2.4.1 Converse and Contrapositive Statements; 2.4.2 Biconditional Statements; 2.5 Propositional Functions and Quantifiers; EXERCISES; Chapter 3 - Methods of Proof 3.1 Theorems, Corollaries, and Lemmas3.2 The Contrapositive and Converse of a Theorem; 3.3 Methods of Proof and Proving Theorems; 3.3.1 Direct Proof; 3.3.2 Indirect Proof; 3.4 Specialized Methods of Proof; 3.4.1 Mathematical Induction; 3.4.2 Uniqueness Proofs; 3.4.3 Existence Proofs; 3.4.4 Proof by Cases; 3.4.5 Proving Biconditional Theorems; 3.4.6 Disproving a Conjecture; 3.5 Some Final Notes on Proving Theorems; EXERCISES; Chapter 4 - Introduction to Number

Theory; 4.1 Binary Operators; 4.2 Commonly Used Number Systems; 4.2.1 The Natural Numbers; 4.2.2 The Whole Numbers; 4.2.3 The Integers
4.2.4 The Rational Numbers 4.2.5 The Real Numbers; 4.3 Elementary Number Theory; 4.3.1 Odd and Even Numbers; 4.3.2 Divisibility; 4.3.3 Prime Numbers; 4.3.4 Recursively Defined Numbers; EXERCISES; Chapter 5 - The Foundations of Calculus; 5.1 Functions; 5.2 Sequences of Real Numbers; 5.2.1 Convergent Sequences and Limit Theorems; 5.2.2 Monotone Sequences; 5.2.3 Cauchy Sequences; 5.3 Limits of Functions; 5.4 Continuity; 5.5 Derivatives; EXERCISES; Chapter 6 - Foundations of Algebra; 6.1 Introduction to Sets; 6.1.1 Set Algebra; 6.1.2 Element Chasing Proofs
6.1.3 Unions and Intersections of Finite Collections of Sets 6.1.4 Countable and Uncountable Sets; 6.2 An Introduction to Group Theory; 6.2.1 Groups; 6.2.2 Subgroups; EXERCISES; References; Index

Sommario/riassunto

A hands-on introduction to the tools needed for rigorous and theoretical mathematical reasoning. Successfully addressing the frustration many students experience as they make the transition from computational mathematics to advanced calculus and algebraic structures, Theorems, Corollaries, Lemmas, and Methods of Proof equips students with the tools needed to succeed while providing a firm foundation in the axiomatic structure of modern mathematics. This essential book:^{*} Clearly explains the relationship between definitions, conjectures, theorems, corollaries, lemmas, and proof
