Librería

Bonilla y Asociados

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Sinopsis

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Identifies the important topics in logic that mathematicians use in their proofs
Methodically presents the key strategies used in mathematical proofs
Each proof strategy is illustrated by a variety of theorems concerning the natural, rational and real numbers
An introduction to group theory and real analysis that presents proof strategies for dealing with the core concepts introduced in these subjects
A Logical Introduction to Proof is a unique textbook that uses a logic-first approach to train and guide undergraduates through a transition or "bridge" course between calculus and advanced mathematics courses. The author's approach prepares the student for the rigors required in future mathematics courses and is appropriate for majors in mathematics, computer science, engineering, as well as other applied mathematical sciences. It may also be beneficial as a supplement for students at the graduate level who need guidance or reference for writing proofs.
Core topics covered are logic, sets, relations, functions, and induction, where logic is the instrument for analyzing the structure of mathematical assertions and is a tool for composing mathematical proofs. Exercises are given at the end of each section within a chapter.

Chapter 1 focuses on propositional logic while Chapter 2 is devoted to the logic of quantifiers. Chapter 3 methodically presents the key strategies that are used in mathematical proofs; each presented as a proof diagram. Every proof strategy is carefully illustrated by a variety of mathematical theorems concerning the natural, rational, and real numbers. Chapter 4 focuses on mathematical induction and concludes with a proof of the fundamental theorem of arithmetic. Chapters 5 through 7 introduce students to the essential concepts that appear in all branches of mathematics. Chapter 8 introduces the basic structures of abstract algebra: groups, rings, quotient groups, and quotient rings. Finally, Chapter 9 presents proof strategies that explicitly show students how to deal with the fundamental definitions that they will encounter in real analysis, followed by numerous examples of proofs that use these strategies. The appendix provides a useful summary of strategies for dealing with proofs.

Content Level » Lower undergraduate

Keywords » Assumption Strategies - Logic used in mathematical proofs - Proof Diagrams - Proof Strategies - Proof strategies that help students compose proofs

Related subjects » Mathematics