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Introduction To Mathematical Structures And Proofs (Undergraduate Texts In Mathematics)

Undergraduate Texts in Mathematics

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Larry J. Gerstein

Introduction to Mathematical Structures and Proofs

Second Edition

Springer
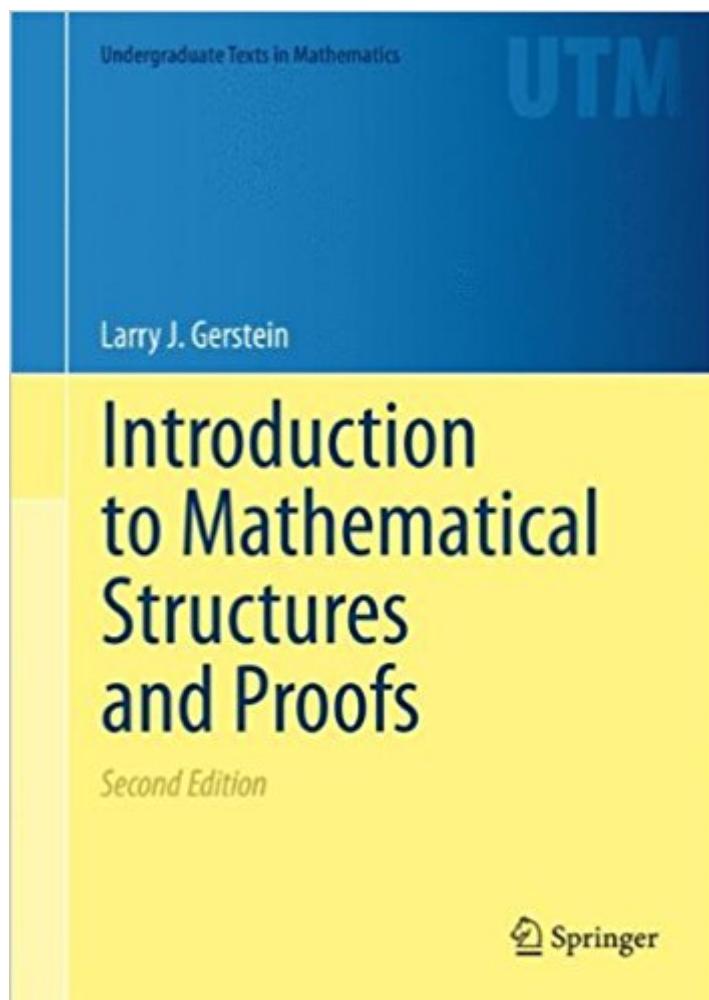
Synopsis

As a student moves from basic calculus courses into upper-division courses in linear and abstract algebra, real and complex analysis, number theory, topology, and so on, a "bridge" course can help ensure a smooth transition. Introduction to Mathematical Structures and Proofs is a textbook intended for such a course, or for self-study.Ã Â This book introduces an array of fundamental mathematical structures. It also explores the delicate balance of intuition and rigorÃ¢â¬â¢and the flexible thinkingÃ¢â¬â¢required to prove a nontrivial result.Ã Â In short, this book seeks to enhance the mathematical maturity of the reader. The new material in this second edition includes a section on graph theory, several new sections on number theory (including primitive roots, with an application to card-shuffling), and a brief introduction to the complex numbers (including a section on the arithmetic of the Gaussian integers). Solutions for even numbered exercises are available on springer.com for instructors adopting the text for a course.

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Customer Reviews

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flexible thinkingÃ¢â¬â¢required to prove a nontrivial result.Ã Â In short, this book seeks to enhance the mathematical maturity of the reader. Ã Â The new material in this second edition includes a section on graph theory, several new sections on number theory (including primitive roots, with an application to card-shuffling), and a brief introduction to the complex numbers (including a section on the arithmetic of the Gaussian integers). Solutions for even numbered exercises are available on springer.com for instructors adopting the text for a course.Ã Â From a review of the first edition: "...Gerstein wantsÃ¢â¬â¢very gentlyÃ¢â¬â¢to teach his students to think. He wants to show them how to wrestle with a problem (one that is more sophisticated than "plug and chug"), how to build a solution, and ultimately he wants to teach the students to take a statement and develop a way to prove it...Gerstein writes with a certain flair that I think students will find appealing. ...I am confident that a student who works through Gerstein's book will really come away with (i) some mathematical technique, and (ii) some mathematical knowledgeÃ¢â¬Â¦.GersteinÃ¢â¬â¢s book states quite plainly that the text is designed for use in a transitions course.Ã Â Nothing benefits a textbook author more than having his goals clearly in mind, and GersteinÃ¢â¬â¢s book achieves its goals.Ã Â I would be happy to use it in a transitions course.Ã¢â¬Â¢ Ã¢â¬â¢Steven Krantz, American Mathematical Monthly>

Larry Gerstein's primary areas of research have been in quadratic forms and number theory and he has published extensively in these areas. The author's first edition of "Introduction to Mathematical Structures and Proofs" has sold to date (8/2/2010) over 6000 copies and has gone through 5 printings. Gerstein himself has a transition course at UC, Santa Barbara (Math 8-A transition to higher mathematics) from his book since its first publication date. The first edition also received 2 glowing reviews by Steve Krantz for the American Mathematical Monthly, and S. Gottwald for Zentralblatt.

We are using this book in my Foundations of Math class, which deals a lot with graph and set theory, as well as proofs. The professor chose the book after listening to the author speak at a conference, and I'd say it was a good choice. The book reads very easily, and the problems do well at not being overly complex, while still being challenging enough to conduce learning.

It's a good book for a hard subject, it's a very readable textbook and the author's wit adds a personality to the text. The only fault is that there aren't a lot of practice problems for some sections, and only the odd answers have solutions in the back of the book.

Dr. Gerstein is now a friend of mine. I highly recommend this textbook in the Field of Logic and Mathematics.

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