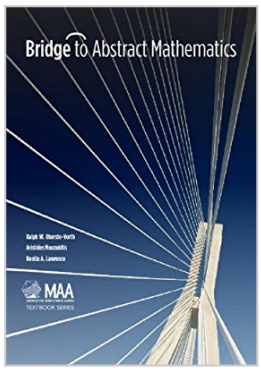

Bridge to Abstract Mathematics (Mathematical Association of America Textbooks)

By Ralph W. Oberste-Vorth, Aristides Mouzakitis, Bonita A. Lawrence

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A *Bridge to Abstract Mathematics* will prepare the mathematical novice to explore the universe of abstract mathematics. Mathematics is a science that concerns theorems that must be proved within the constraints of a logical system of axioms and definitions, rather than theories that must be tested, revised, and retested. Readers will learn how to read mathematics beyond popular computational calculus courses. Moreover, readers will learn how to construct their own proofs.

The book is intended as the primary text for an introductory course in proving theorems, as well as for self-study or as a reference. Throughout the text, some pieces (usually proofs) are left as exercises; Part V gives hints to help students find good approaches to the exercises. Part I introduces the language of mathematics and the methods of proof. The mathematical content of Parts II through IV were chosen so as not to seriously overlap the standard mathematics major. In Part II, students study sets, functions, equivalence and order relations, and cardinality. Part III concerns algebra. The goal is to prove that the real numbers form the unique, up to isomorphism, ordered field with the least upper bound; in the process, we construct the real numbers starting with the natural numbers. Students will be prepared for an abstract linear algebra or modern algebra course. Part IV studies analysis. Continuity and differentiation are considered in the context of time scales (nonempty closed subsets of the real numbers). Students will be prepared for advanced calculus and general topology courses. There is a lot of room for instructors to skip and choose topics from among those that are presented.

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Editorial Review

Review
For a variety of reasons, over the past 30 years or so, "bridge" or "transition" courses have become staples in the undergraduate mathematics curriculum. The purpose of these courses, broadly speaking, is to introduce students to abstract and rigorous mathematical thinking, at a level appropriate to their learning, to make conjectures and construct proofs--things they do not usually see in calculus at present. This work by Oberste-Vorth (Indiana State), Mouzakitis (Second Junior High School of Corfu, Greece), and Lawrence (Marshall Univ.) has evolved from courses taught at the University of South Florida and Marshall University and is worthy of consideration. Coverage includes standard ideas involving set, functions, relations, and cardinality as well as mathematical statements and logic and types of proof. Building on these early notions, an instructor can then choose to go in the direction of number systems (including construction of the reals from the rationals) with an algebraic flavor or toward analysis (here, including time scales and continuity). The analysis direction is perhaps the rockier road to travel. Given the purpose and the audience, the exposition is commendably open and not terse. The book includes scores of exercises scattered throughout, with many end-of-chapter supplemental exercises. --D. Robbins, CHOICE

To begin the process of being able to write and understand proofs it is necessary for the student to go back a few squares on the mathematical board game and learn the rigorous definitions of concepts such as the structure of mathematical statements, set theory and the underlying structural definitions of the basic number systems. Knowing these concepts very well gives the student the foundation for entering the proof realm and it helps to overturn their complacent belief of understanding.

This book is designed to give the reader that understanding and the mission is a success. The authors provide detailed explanations of the foundations of mathematics needed to work comfortably with proofs, both operationally and theoretically. It would be an excellent choice for a freshman/sophomore level course in the foundations of mathematics designed to prepare students for the rigors of proofs that they will experience in their later years. --Charles Ashbacher, Journal of Recreational Mathematics

About the Author

Ralph W. Oberste-Vorth earned his Ph.D. in mathematics from Cornell University. In 2002, he became the Chariman of the Department of Mathematics at Marshall University. In 2011, he accepted a position as the Chairman of the Department of Mathematics and Computer Science at Indiana State University.

Aristides Mouzakitis received his BA and MA in mathematics from Hunter College. In Greece, he has worked as a teacher in secondary education and as an English-Greek translator of popular mathematics books and articles. In 2009, he earned his doctorate in mathematics education from the University of Exeter in England.

Bonita Lawrence is currently a Professor of Mathematics at Marshall University. She received her baccalaureate degree in Mathematics Education from Cameron University in 1979. After ten years of teaching, she returned to school and earned her Master's degree in Mathematics at Auburn University and went on to receive her Ph.D. in Mathematics at University of Texas at Arlington.

Users Review

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Wallace Long:

The reason? Because this Bridge to Abstract Mathematics (Mathematical Association of America Textbooks) is an unordinary book that the inside of the e-book waiting for you to snap that but latter it will zap you with the secret it inside. Reading this book beside it was fantastic author who have write the book in such wonderful way makes the content inside of easier to understand, entertaining way but still convey the meaning totally. So , it is good for you because of not hesitating having this ever again or you going to regret it. This amazing book will give you a lot of gains than the other book have such as help improving your expertise and your critical thinking technique. So , still want to hold up having that book? If I ended up you I will go to the reserve store hurriedly.

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