Basic Set Theory (Student Mathematical Library, V. 17)

By S. Shen, Nikolai Konstantinovich Vereshchagin, A. Shen

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The main notions of set theory (cardinals, ordinals, transfinite induction) are fundamental to all mathematicians, not only to those who specialize in mathematical logic or set-theoretic topology. Basic set theory is generally given a brief overview in courses on analysis, algebra, or topology, even though it is sufficiently important, interesting, and simple to merit its own leisurely treatment.

This book provides just that: a leisurely exposition for a diversified audience. It is suitable for a broad range of readers, from undergraduate students to professional mathematicians who want to finally find out what transfinite induction is and why it is always replaced by Zorn's Lemma.

The text introduces all main subjects of "naive" (nonaxiomatic) set theory: functions, cardinalities, ordered and well-ordered sets, transfinite induction and its applications, ordinals, and operations on ordinals. Included are discussions and proofs of the Cantor-Bernstein Theorem, Cantor's diagonal method, Zorn's Lemma, Zermelo's Theorem, and Hamel bases. With over 150 problems, the book is a complete and accessible introduction to the subject.

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Editorial Review

Review
"Lovely little book ... does a truly marvelous job in covering what every one in the game should know, whether he be an analyst, geometer, algebraist or number theorist--or anything else, for that matter. It's all there, from Cantor's theory of cardinals to transfinite induction, from Zermelo to Zorn ... it is a terrific book and does everything right: its selection of topics is not only logical, it is elegant, and the coverage is superb ... The problems are very nice: interesting and non-trivial ... and they supplement the main body of the text very well ... the book is a pedagogical marvel ... would be perfect for self-study ... would also be a marvelous experience ... to use the book in a first course on set theory ... a very nice bit of work ... I very recently used the book's proof of the existence of a Hamel basis for any vector space in my course on Advanced Linear Algebra. It is an extremely slick and quick argument ... And the discussion given in the book is typical of the entire book: to the point, elegant, and complete ... I highly recommend this book ... it covers the basic set-theoretic tool-kit every mathematician should carry around at all times, and does so with style. And then there are all the beautiful applications, challenging and elegant problems, and even a lot of surprises." ---- MAA Online

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