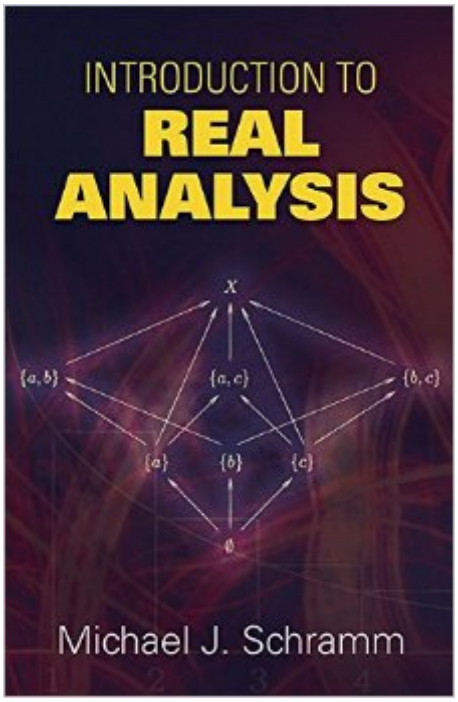
Introduction To Real Analysis (Dover Books On Mathematics)



Synopsis

This text forms a bridge between courses in calculus and real analysis. It focuses on the construction of mathematical proofs as well as their final content. Suitable for upper-level undergraduates and graduate students of real analysis, it also provides a vital reference book for advanced courses in mathematics.The four-part treatment begins with an introduction to basic logical structures and techniques of proof, including discussions of the cardinality concept and the algebraic and order structures of the real and rational number systems. Part Two presents in-depth examinations of the completeness of the real number system and its topological structure. Part Three reviews and extends the previous explorations of the real number system, and the final part features a selection of topics in real function theory. Numerous and varied exercises range from articulating the steps omitted from examples and observing mechanical results at work to the completion of partial proofs within the text.

Book Information

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Customer Reviews

Why do real analysis books teach the nested intervals theorem? Why do they teach Cauchy sequences, and compact sets? Why bother teaching Archimedes Axiom? Wouldn’t just teaching the Completeness Axiom suffice? I recommend Schramm’s book because it makes clear that the above topics distinguish the real numbers from the rationals, AND the book shows how the topics are equivalent. Schramm’s book gives those "ah ha" moments on a large level.Another strength of this

book is that he demonstrates how to work through and write proofs. The author uses Daniel Solow's How to Read and Do Proofs: An Introduction to Mathematical Thought Processes "forward-backward" method. For learning how to do proofs, I also recommend Daniel Velleman's How to Prove It: A Structured Approach.One is advised to have a teacher handy for hints and help in working through this book (I try to keep a spare teacher in my upper desk drawer -- just kidding). The questions that the exercises pose are germane despite the book not having a solutions section.Well rated and well written. On the introductory level I recommend Steven LayAnalysis with an Introduction to Proof (5th Edition) as well as Bartel

The prerequisites for analysis at the university I attended were multivariable calculus (Marsden), linear algebra (FIS), and an introduction to proofs (Cupillari). I believe my lowest grade in those courses (on any test or homework) was 90. To say that I was confident going into my analysis course would be an understatement. Rudin greeted me with a delicious slice of humble pie and I think I got a 60 on my first homework assignment. Unlike the prior courses where I was able to gain mastery through repetition, I was stumped by Rudin because the concepts were unfamiliar and there weren't enough easy problems to work on. The remedy is, of course, to attend office hours regularly and collaborate with your classmates. Because of my schedule, neither was possible. I stumbled upon Schramm's book and ultimately earned an A- (and have since then come to enjoy Rudin).Schramm's book gave me the hand holding I needed at that time - he moves very slowly through sup, inf, open/closed sets and cluster points. Additionally, he discusses the "forward-backward" technique of writing proofs found in Solow's book - which I used as well. My initial approach was to write a proof in a linear fashion. From Schramm (and Solow) I discovered that writing a proof is like putting a puzzle together; you can start anyway/anywhere to make progress as the picture becomes clear to you, so long as the end result is the correct picture (and then once you've got it, you should clean it up to make it presentable).I would recommend this book to anyone struggling with Rudin. Will it help you? As Oscar Wilde so eloquently stated in the preface of The Picture of Dorian Gray, "It is the spectator, and not life, that art really mirrors".

Let us start by saying that Real Variables is not going to be an easy topic. (Like saying that Schramm's book is a very bad book, but all of the others are so much worse, to paraphrase Churchill.). If you grabbed a bunch of books on Real variables and read them side by side. like I did, this would be the one that you will finish reading first as you lay the others aside for later reading. One reason is the learning curve which is not particularly steep, but it is monotonic, closed, and

bounded. Unlike other Real Variable texts, this one is about Proof Building. Part One lays the foundation with Proof Building Methodology.Part Two is ostensibly about the Real Number System, the centerpiece of which is "The Big Theorem", a set of nine theorms which mutually prove each other. Though Schramm does not give all 45 proofs, he does give a set of nine Theorems, a Theorem Chain from which a path can be traced from one proof to another. For example, The Connectedness Property implies The Least Upper Bound Property which implies the Nested Intervals Peoperty which implies The Bolszano-Weirstrauss Theorem which implies that Cauchy Sequences converge. The path back from Cauchy Sequenses converging to The Connectedness Property is different and as follows: Cauchy Sequences converging implies The Bolzano-Weirstrauss Theorem which implies The Least Upper Bound Property which implies The Connectedness Property. (Are you with me so far?) As Schramm does this, he does two very important things: 1) He gives Proof Building Strategies, inventorying the tools you haveto work with for each proof; 2) he uses The Forward and Back Method, which is basically stating the facts you have in the beginning, leaving the middle for later, and stating how the proof should end.

Mathematics) A History of Vector Analysis: The Evolution of the Idea of a Vectorial System (Dover Books on Mathematics)