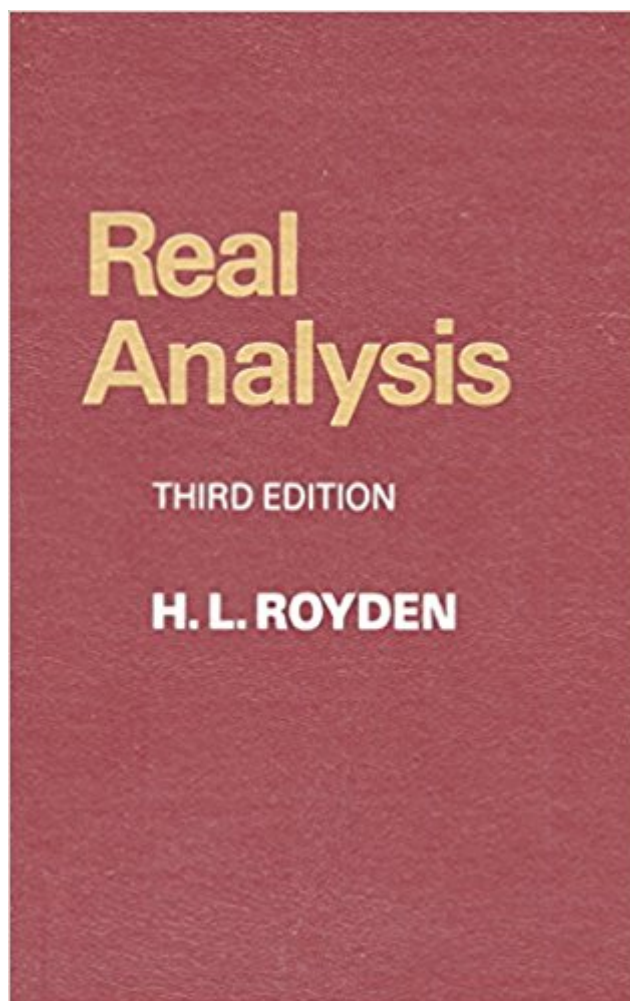


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# Real Analysis, 3rd Edition



## Synopsis

This is the classic introductory graduate text. Heart of the book is measure theory and Lebesgue integration.

## Book Information

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## Customer Reviews

This is the classic introductory graduate text.

This book, as far as I consider it, is a classic. Although it has some errata and stuff, it is one of the best books ever written in Real Analysis. I am happy to managed get this specific edition since the author didn't manage to publish its fourth edition, while it was Fitz Patrick the one who edited that edition. I think that books are more valuable when the authors are the only ones who edit them, otherwise I don't think they're worth reading. At least that's my opinion. Then, about the book, it takes to know some modern algebra, set theory and basic analysis to study from this fine book. I haven't seen a book that specially teaches Daniell's integral and this one does. The book is rich on references where one could further study material related to real analysis to the higher level. I think this book will be very useful to serious mathematicians and to those self-studying guys who love the rigour.

Excellent

I had this as my reference for my first graduate analysis course. It is absolutely excellent and I vastly prefer it to Rudin. Covers some basics of metric spaces, then some fairly nice amounts of topology, measure theory, topological groups, etc. Very pleased :)

I appreciate the approach Royden chooses in beginning with Lebesgue measure first then addressing general measure at the end of the book. For those of you frustrated by this approach, you can jump right to chapters 11 and 12 for a general treatment first. While Royden doesn't prove every theorem, enough are proved to give you an idea of how to approach the problem sets. If you take your time and follow each theorem's proof (and of course make your own notes after you understand each proof), you'll get what's going on. I thought some of the exercises were very tough given the fairly straightforward theorems Royden proves in the chapters (I didn't particularly care for the Cantor set problems, amongst others). It is interesting to contrast the slow pace of chapters 1-4 (even with chapters 1&2 essentially skimmed) with the quicker treatment in chapters 11&12. Towards the end, I very much appreciated how chapters 3&4 complemented chapters 11&12 (and vice versa). Very nicely done.

Many people criticize this book as unclear and unnecessarily abstract, but I think these comments are more appropriately directed at the subject than at this book and its particular presentation. I find this classic to be one of the best books on measure theory and Lebesgue integration, a difficult and very abstract topic. Royden provides strong motivation for the material, and he helps the reader to develop good intuition. I find the proofs and equations exceptionally easy to follow; they are concise but they do not omit as many details as some authors (i.e. Rudin). Royden makes excellent use of notation, choosing to use it when it clarifies and no more--leaving explanations in words when they are clearer. The index and table of notation are excellent and contribute to this book's usefulness as a reference. The construction of Lebesgue measure and development of Lebesgue integration is very clear. Exercises are integrated into the text and are rather straightforward and not particularly difficult. It is necessary to work the problems, however, to get a full understanding of the material. There are not many exercises but they often contain crucial concepts and results. This book contains a lot of background material that most readers will either know already or find in other books, but often the material is presented with an eye towards measure and integration theory. The first two chapters are concise review of set theory and the structure of the real line, but they emphasize different sorts of points from what one would encounter in a basic advanced calculus book. Similarly, the material on abstract spaces leads naturally into the abstract development of

measure and integration theory. This book would be an excellent textbook for a course, and I think it would be suitable for self-study as well. Reading and understanding this book, and working most of the problems is not an unreachable goal as it is with many books at this level. This book does require a strong background, however. Due to the difficult nature of the material I think it would be unwise to try to learn this stuff without a strong background in analysis or advanced calculus. A student finding all this book too difficult, or wanting a slower approach, might want to examine the book "An Introduction to Measure and Integration" by Inder K. Rana, but be warned: read my review of that book before getting it.

I used this text as senior undergraduate in an introductory course to real variables. The course was structured as a sort of modified RL Moore method class: there were very few lectures, and we (the students) could only use theorems and propositions presented in the text if we had gone to the board and presented a valid proof for each. As such, most of the students learned the fundamentals very well. This in turn made my first graduate course in real variables much easier. The biggest downside however is that most graduate students don't have the time needed to dedicate to the various problems in this text, which is why Royden is probably not the best choice for a first year graduate text. Instead I would recommend Bartle's Elements of Integration and Lebesgue Measure as a first year grad text on the subject. It was disappointing to use Bartle and discover that so many of the problems in Royden, which I had spent countless hours attempting to prove, had been completely worked out in Elements of Integration. In short, Royden makes you work for many (most?) important results, and in the long run this makes for a much stronger understanding of the material- if you have the time to devote to it.

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