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A sequential introduction to real analysis.

Essential Textbooks in Mathematics 1. Hackensack, NJ: World Scientific; London: Imperial College Press (ISBN 978-1-78326-782-8/hbk; 978-1-78326-783-5/pbk). xxii, 251 p. (2016).

The present work is intended to cover the main topics of an introductory and rigorous course on real analysis. The novelty of the book lies on the fact that the author adopts a sequential point of view, as the title announces, instead of the classical ε-δ presentation. All the parts are based upon the notion of convergence of a sequence with the hope that students understand and control the topics with a comprehensive view of the subject. In our opinion, this pedagogical purpose is achieved amply, due among other to a clear exposition, in which main definitions are preceded by explanations and comments helping to focus the idea behind the concept, and a fresh and close to young readers language which invites them to go through the pages of the book without fear of the challenge of the formalization and of a reasoned and founded knowledge of mathematics. In this setting, it will be welcome by undergraduate students having real analysis as a part of their curricula. The contents are the following: Chapter 1. Basic properties of the set of real numbers. Chapter 2. Real sequences. Chapter 3. Limit theorems. Chapter 4. Subsequences. Chapter 5. Series. Chapter 6. Continuous functions. Chapter 7. Some symbolic logic. Chapter 8. Limits of functions. Chapter 9. Differentiable functions. Chapter 10. Power series. Chapter 11. Integration. Chapter 12. Logarithms and irrational powers. Chapter 13. What are the reals? Epilogue: Let there δ. Further reading. Solutions to tutorial problems. Index. The book starts its travel with an axiomatic presentation of the set of real numbers (the explicit construction is given at Chapter 13, through rational Cauchy sequences) and a careful explanation of the concept of limit of a sequence. After developing the first topics, the author stops at Chapter 7 in order to give a detailed explanation of propositional logic, with the formalism and manipulation of usual quantifiers. In this way, the author has preferred to postpone this topic to the middle of the book, rightly in our opinion, in order to not divert the attention of the reader and once he/she is able to follow without difficulty these logical developments. The book continues by showing, always from a sequential point of view, topics so important as differentiability and Riemann integration. In Chapter 13 the set of reals is constructed by using rational Cauchy sequences. It is worth pointing out that each chapter ends with a summary drawing its main concepts and results, and with a very well balanced set of tutorial (with their complete solutions at the end of the book) and homework problems. At the epilogue the author shows the equivalence between his sequential approach and the conventional ε-δ one. As the author himself confesses, "the approach to real analysis we have taken in this book is something of a minority sport", and, even more, we can add that with this activity the student will enjoy of a more comfortable and bearable introduction to analysis. Moreover, there exists an abundant and excellent literature on the ε-δ style, as pointed in the section of further readings, where the reader, if required, will study some additional topics as, for instance, uniform continuity or uniform convergence of sequences and series of functions. Finally, let us mention that once accustomed to the mathematical diet proposed by the author, if the student wants to improve and to strengthen its mathematical health, protein doses in the form of language ε-δ will be highly recommended. *Antonio Linero Bas (Murcia)*

Classification: I15
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