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Computability in Analysis and Physics

Contents: Introduction. – Prerequisites from Logic and Analysis. – Computability in Classical Analysis. – The Computability Theory of Banach Spaces. – The Computability Theory of Eigen-values and Eigenvectors. – Addendum: Open Problems. – Bibliography. – Subject Index.

This book represents the first treatment of computable analysis at the graduate level within the tradition of classical mathematical reasoning Computable analysis involves a marriage between analysis and physics on the one hand, and computability on the other Computability, of course, brings to mind computers, which are playing an even larger role in analysis and physical theory. Thus it becomes useful to know, at least theoretically, which computations in analysis and physics are possible and which are not
This book develops a coherent framework for solving problems in computable analysis. A variety of questions in this area can be answered within this framework. Among the topics dealt with are: computability for classical analysis, Hilbert and Banach spaces, bounded and unbounded linear operators, eigenvalues, eigenvectors, and the equations of mathematical physics.
Requiring no prior knowledge of the theory of computability, the book is designed to provide the reader with easy access to research in this area

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