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Book Review

Introduction to MAPLE

Andre Heck

Springer-Verlag 1993, 497 pp
 ISBN 0-387-97662-0 (New York)
 ISBN 3-540-97662-0 (Berlin)

Reviewed by Pat O'Leary

This book is the first real introduction to Maple and, as such, is very welcome. The author is managing director of the CAN (Computer Algebra in the Netherlands) which stimulates and coordinates the use of computer algebra in education and research. The book is an introduction and has to be viewed as such. It begins by discussing computer algebra and as well as discussing the advantages, some limitations of computer algebra are mentioned. The version of Maple used is release 2 of Maple V, which has been superseded by the launch of version 3 in April 1994 (a common problem with books on software) but given the introductory nature of the book, and the nature of changes in the new release, this does not cause major problems.

After the introduction, the basic syntax of Maple is introduced at a very reasonable pace and there are many good exercises at the end of each chapter. There is a very clear exposition of the structure of the language and of data types (a subject that often causes problems for students). The author also illustrates some difficulties that arise with examples, particularly with plotting. In the chapter on solving equations there is a nice demonstration of the use of Gröbner basis for solving non-linear differential equations. The last chapter looks at applications using the Linear Algebra package. The book has an extensive list of references on the material of the book. Given the large number of examples of code in the book, it would have been greatly enhanced if a diskette with code had been included with it, or was even available as a

companion to it. Also there is a very sparse amount of material on procedures in Maple. Overall this book is a very welcome addition to the literature on Maple.

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Book Review

Theory of Singular Boundary Value Problems

D. O'Regan

World Scientific, Singapore, 1994, xi+154pp

ISBN 981-02-1760-9

Price \$ 38.00, hardback.

Reviewed by Johnny Henderson

The last decade has given rise to much activity in the area of boundary value problems (BVP's) for singular ordinary differential equations (ODE's), with this book's author contributing significantly to that activity. The book under review presents some topics of current interest in the theory of regular and singular BVP's (singular in both independent and dependent variables), with the two objectives to serve as a graduate text on the existence theory for these problems, as well as acquainting researchers new to the field with results and methods. The author states that no attempt has been made to deal in greatest generalities, and yet while the book is restricted to second order ODE's, a very general theory is developed for singular two-point BVP's in this context. While the book is self-contained, a reasonable background in real and functional analysis is assumed on the part of the reader.

There are ten clearly written chapters. While there are no formally listed exercises, the work involved in verifying results for cases analogous to those the author presents in detail serves as an adequate set of exercises. References are included at the end of each chapter.

Chapter 1 is an introduction, which serves as motivation for the study of singular two-point BVP's for second order ODE's, via presentation of problems involving, for example, the study of steady-state oxygen diffusion in a cell with Michaelis-Menten kinetics, the determination of the electrical potential in an atom due