The only really objectionable statement I found occurs on p. 242 (and recurs on p. 246). It is stated that the problem with implicit finite difference methods in parabolic problems in two space dimensions is that the resulting linear system of equations to solve involves a penta-diagonal matrix, and thus the effective tri-diagonal solver cannot be applied. Of course, there are very effective penta-diagonal solvers, but the matrix is not penta-diagonal.

Given that the book aims for a first course covering "The Classics", the treatment is excellent from a pedagogical point of view. The student is slowly and carefully led towards a thorough understanding of the methods.

Finally, the writing is very polished and I found it a pleasure to read!

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17[65L00, 65M00, 65N00].—JAMES M. ORTEGA & WILLIAM G. POOLE, JR., *An Introduction to Numerical Methods for Differential Equations*, Pitman, Boston, Mass., 1981, ix + 329 pp., 24 cm. Price $24.95.

Although the title of this book is a correct description of its content, it may be a bit misleading. This is really an introductory textbook on Numerical Methods, and it is distinct from other such books mainly by its arrangement of the material; linear equations, e.g., are treated as the predominant part of a chapter on boundary value problems for o.d.e., numerical quadrature is presented as a tool in the context of projection methods, etc. While thus the constructive solution of differential equations (including p.d.e.) serves as the frame of reference, the treatment of the classical material within this frame is just as broad and detailed as is usual for a first introduction to Numerical Mathematics. It is difficult to tell whether this arrangement will be more appealing to students; in any case it permits the use of demonstrative application examples in differential equations throughout the book.

Generally, the authors have avoided formulating and proving theorems; they state many results in a semiformal way and rather provide motivations and explanations. However, the presentation is sufficiently technical and concise that more formal results and proofs may easily be added here and there by a more ambitious instructor; references, supplementary remarks, and a set of well-chosen exercises help the reader to gain a deeper understanding if he wishes. On the other hand, the text may disappoint those who are looking for an easy access to the practical use of numerical methods (say science or engineering students); they will feel diverted by the many mathematically minded discussions and will miss concrete guidelines for the use of relevant library programs.

The introductory chapter on "the world of scientific computing" which includes a discussion of symbolic computation starts the text off nicely, and there are a few chapters which are exemplary in their short and clear presentation of essential aspects. The sections on eigenvalue problems, on sparse linear equations, and on projection methods I found particularly well-composed. Also I liked a number of details (like the "interval of uncertainty" about a zero of a function) and many of the numerous illustrations. (Curiously, the grossly incorrect Figure 5.2(b) for the midpoint rule went unnoticed.) What I missed most is a systematic introduction of the concept of condition, beyond the discussion in the context of linear equations.

It would also have been nice to have a general chapter on numerical software, with detailed references for each subject area. An innocent reader of this text may rather be tempted to program his (or her) own routines than to resort to the well-known software packages.

On the whole, this is a refreshingly written presentation of wide areas of our field and a welcome addition to the textbook literature.

H. J. S.

18[65N30].—J. R. WHITEMAN (Editor), *The Mathematics of Finite Elements and Applications* IV, MAFELAP 1981, Academic Press, London, New York, 1982, xvi + 555 pp., $23\frac{1}{2}$ cm. Price $40.50.

This volume contains 44 papers and 39 abstracts of poster session papers presented at the fourth conference on The Mathematics and Finite Elements and Applications held at Brunel University, England, from April 28–May 1, 1981.

19[65K10].—M. J. D. POWELL (Editor), *Nonlinear Optimization* 1981, Academic Press, London, New York, 1982, xvii + 559 pp., $23\frac{1}{2}$ cm. Price $39.50.

This volume is based on the proceedings of the NATO Advanced Research Institute held at Cambridge from July 13–24, 1981. There are 31 invited papers divided into the following chapters: Unconstrained Optimization, Nonlinear Fitting, Linear Constraints, Nonlinear Constraints, Large Nonlinear Problems, The Current State of Software, and Future Software Testing. Each chapter ends with a discussion of that particular topic.

20[65–00].—R. GLOWINSKI & J. L. LIONS (Editors), *Computing Methods in Applied Sciences and Engineering* V, North-Holland, Amsterdam, New York, 1982, x + 668 pp., 23 cm. Price $95.00.

This is the proceedings of the Fifth International Symposium on Computing Methods in Applied Sciences and Engineering held at Versailles, France, from December 14–18, 1981. It contains 41 papers on the following topics: Numerical Algebra, Stiff Differential Equations, Parallel Computing, Approximation of Eigenvalues and Eigenfunctions-Bifurcation, Wave Propagation, Nonlinear Elasticity, Fluid Mechanics, Plasma Physics, Turbulence, Semiconductors, Biomathematics, and Inverse Problems.

21[12A50].—FRANCISCO DIAZ Y DIAZ, *Tables Minorant la Racine n-ième du Discriminant d'un Corps de Degré n*, Publications Mathématiques d'Orsay, France, 1980, 60 pp., 30 cm. Price—not available.

Let K be a number field of degree n, and let d be the absolute value of its discriminant. Odlyzko [3] showed how to give lower bounds for $d^{1/n}$. Subsequent work was done by Serre and Poitou [5]. In the present work, the author uses Poitou's formulas to calculate such lower bounds in the following cases: Table 1: K totally imaginary, $2 \leqslant n \leqslant 4000$; Table 2, K totally real, $1 \leqslant n \leqslant 2000$; Table 3: all K with