However, the presentation is often rather superficial and to a large extent the book does not present state of the art methods. Therefore, there are several other books (in the English language) which I would rather recommend to a physicist or engineer. Unfortunately, these books are not even referenced in this text.

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17[5.00].—W. L. Wendland, *Elliptic Systems in the Plane*, Fearon-Pitman, Belmont, California, 1979, xi + 404 pp., 24 cm. Price $64.95.

The numerical solution of elliptic boundary value problems is an active area of research, as readers of this journal know. Most of the computational effort in this subject is devoted to two-dimensional problems, if only because of the cost of higher-dimensional calculations. On the other hand, the theory of elliptic boundary value problems is well developed, and the theory has simplifications for problems of two independent variables. This book gives, in the first part, a treatment of boundary value problems for elliptic systems in two independent variables, and in the second part, a treatment of the numerical solution of these problems. The result is an unusual collection of material that is worthy of consideration by those that are seriously interested in the subject.

The first part of the book is devoted to the solvability and regularity theory for elliptic systems in two independent variables. Various normal forms for these systems are given, and the Fredholm character of the problem is established by a homotopy argument. Formulas for the index of the problem are given. There is a brief discussion of nonlinear problems. Several integral equation formulations of these problems are also given. There is no discussion of piecewise smooth coefficients or domains, or of systems that are elliptic in the more general sense of Agmon-Douglis-Nirenberg, topics of current interest to numerical analysts.

The second part of the book is devoted to a theoretical analysis of numerical methods for the solution of elliptic boundary value problems. There are chapters on integral equation methods, finite difference methods, and a final chapter on least squares and Galerkin methods. In each case, the treatment includes the formulation of the method and an error analysis. The chapter on integral equations includes a section on numerical methods for conformal mapping. The chapter on difference equations starts with matrices of positive type and bounds for the discrete Green's function for the Laplace equation, as found in the classical papers of Bramble, Hubbard, and Thomée. The discrete Green's function is used to cast the discrete boundary value problem into a system of discrete integral equations, and error estimates are obtained for the solution of this system. The final chapter develops the theory of weighted least squares methods of a first order elliptic system. A final section relates this to Galerkin methods for second order systems, and gives an error analysis, including L_∞ error estimates.

This book contains a lot of mathematics. It is written in a somewhat compressed style, but each chapter contains an introduction which carefully explains the material that follows. There are many references to the literature. The character of the book is that of a research monograph rather than a textbook. The more practical aspects of numerical analysis are not to be found here, but it is a valuable exposition of the related topics of existence theory and error estimates for elliptic boundary value problems.

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18 [5.00].—SEYMOUR V. PARTER, Editor, *Numerical Methods for Partial Differential Equations,* Academic Press, New York, 1979, ix + 332 pp., 23 cm. Price $14.50. (Publication of the Mathematics Research Center, the University of Wisconsin-Madison, no. 42.)

The book is the proceedings of a seminar held in Madison in October 1978. A person contemplating whether to order the book might be served by a list of the contributions:

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