moments of distributions, finding Gaussian quadrature rules, expressing the solutions of differential equations as power series or as series of orthogonal polynomials, and evaluating and transforming such series.

The last part of the book is concerned with nonlinear multidimensional recurrences and iterations. In contrast with the earlier section, where the emphasis was on the generation of sequences and on the questions of stability and convergence of the backward recurrence as the starting point increased, the principal interest with these recurrences is the behavior of the sequences which are generated as a function of the initial values. Although the strange behavior of sequences which do not converge has attracted considerable recent interest, the field is too new for definitive treatment, and cases in which the sequences do converge to a limit are treated more fully. These include the classical Gauss arithmetic-geometric mean algorithm for the complete elliptic integral, as well as the Borchardt and Bartky algorithms. These are of particular interest both because of the classic nature of the problems which they solve, including the rectification of the lemniscate and ellipse, but also because they provide approaches to evaluating general elliptic functions and integrals which are not hypergeometric and do not satisfy linear differential equations.

In summary, the numerical mathematician concerned with evaluation of special functions will find most of this book of exceptional value, while the mathematician interested in other topics will be introduced to many surprising results, which draw on a wide spectrum of classical mathematical techniques.

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Modern dimension theory (second edition, revised and extended), by J. Nagata, Sigma Series in Pure Mathematics, vol. 2, Heldermann-Verlag, Berlin, 1983, 68.00 DM, x + 284 pp. ISBN 3-88538-002-1

Dimension theory is one of the triumphs of point-set topology. When Cantor showed that Euclidean spaces of different dimensions nevertheless admitted one-one correspondences, and Peano showed that this could even happen in a continuous way, the naive ideas about dimension were shattered. Was there even a topological invariant that could be called dimension? Brouwer showed that this was so, at least for Euclidean spaces; but his work did not lead to a satisfactory general theory. The key idea was contained in a remark of