Table 3

$N = 12$, $k^2 = 0 \cdot 9$, $\bar{\lambda} = 592 \cdot 0$. Calculation of $\bar{x}$ using nine significant decimals

Forward sequence	Backward sequence	Normalized x
$\bar{x}_0 = (1 \cdot 00000\ 000)10^0$	$\bar{x}'_{12} = (1 \cdot 00000\ 000)10^0$	$(4 \cdot 22800\ 442)10^{-9}$
$\bar{x}_1 = (2 \cdot 96000\ 000)10^2$	$\bar{x}'_{11} = (5 \cdot 93853\ 428)10^0$	$(1 \cdot 25148\ 931)10^{-6}$
$\bar{x}_2 = (1 \cdot 44602\ 000)10^4$	$\bar{x}'_{10} = (1 \cdot 54164\ 434)10^1$	$(6 \cdot 11377\ 896)10^{-5}$
$\bar{x}_3 = (2 \cdot 75969\ 664)10^5$	$\bar{x}'_9 = (2 \cdot 29697\ 043)10^1$	$(1 \cdot 16680\ 096)10^{-3}$
$\bar{x}_4 = (2 \cdot 71510\ 608)10^6$		$(1 \cdot 14794\ 805)10^{-2}$
$\bar{x}_5 = (1 \cdot 57308\ 652)10^7$		$(6 \cdot 65101\ 676)10^{-2}$
$\bar{x}_6 = (5 \cdot 76820\ 168)10^7$		$(2 \cdot 43879\ 822)10^{-1}$
$\bar{x}_7 = (1 \cdot 39028\ 932)10^8$		$(5 \cdot 87814\ 939)10^{-1}$
$\bar{x}_8 = (2 \cdot 23252\ 031)10^8$		$(9 \cdot 43910\ 575)10^{-1}$
$\bar{x}_9 = (2 \cdot 36518\ 201)10^8$		$(1 \cdot 00000\ 000)10^0$
		$(6 \cdot 71164\ 208)10^{-1}$
		$(2 \cdot 58537\ 690)10^{-1}$
		$(4 \cdot 35356\ 062)10^{-2}$

Check $a_9\bar{x}_8 + (b_9 - \bar{\lambda})x_9 + c_9\bar{x}_{10} = -\ 278 \cdot 642402 + 278 \cdot 642400.$

be derived from A by altering b_{10} by a quantity of the order of $10^{-1}.2^{-16}$, and the residual obtained from such an $\bar{A}$ is scarcely different from that obtained from A itself. If we use any value of $\bar{\lambda}$ between, say, $592 \cdot 0$ and $593 \cdot 0$ the "check" gives an equally satisfactory result! For larger values of N the check becomes even weaker.

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Book Review

Elements of Numerical Analysis, by Peter Henrici, 1965; 328 pages. (London and New York: *John Wiley and Sons Ltd.*, 60s.)

Among the many books on numerical analysis which have been published in the last few years this volume is outstanding. Professor Henrici has developed the subject as a mathematical discipline, emphasising the fact that the roots of numerical analysis lie in the field of mathematical analysis, and that numerical analysis is a science and not an art. This book is not a collection of recipes, and potential users requiring this type of approach to the subject will have to look elsewhere. Rather, it is a book for mathematicians and is suitable for a first course in numerical analysis for such students. Among topics which hitherto have not appeared in a book of this type are Romberg integration and, particularly valuable, a nicely written introduction to the theory of error propagation.

It is also a relief to open a book on numerical analysis which does not devote an unnecessarily large amount of attention to the theory of finite differences. One topic which has been omitted completely is numerical methods in algebra and matrix theory, but several well written books on this topic are currently available. For most people, a thorough understanding of any branch of mathematics is only obtained after a large number of examples have been worked out. The present volume is excellent in this respect since it has over 300 examples of varying degrees of difficulty, together with a small number of research problems.

The book is divided into three parts: Part one deals with the solution of equations, including simple iteration methods, Bernoulli's method and the Quotient Difference Algorithm. The second part deals with interpolation and approximation and ends with a discussion of numerical solutions of differential equations. The final part is quite short, containing chapters on number systems and error propagation.

The book can be recommended for an introductory course on numerical analysis.

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