tabulated here on pages 37, 39, and 45. Two of them, namely those designated as (31) and 16 $\Gamma_2 d$, are *conformal* to each other, that is, they contain an equal number of elements of each order. Likewise, the three groups (2^2), 16 $\Gamma_2 a_2$, and 16 $\Gamma_2 c_2$ are conformal, and so are the three groups (21^2), 16 $\Gamma_2 b$, and 16 $\Gamma_2 c_1$. The remaining 6 groups are conformal to no group.

By examination, we now note that although (31) and 16 $\Gamma_2 d$ are not isomorphic, they do have a lesser degree of similarity that we may call *isopotent*. We say that two groups are isopotent if their elements may be put into 1–1 correspondence: $a \leftrightarrow \alpha$, in such a way that all powers are also in correspondence: $a^n \leftrightarrow \alpha^n$. In distinction to this pair of isopotent groups, no two of the three conformal groups: (2^2), 16 $\Gamma_2 a_2$, and 16 $\Gamma_2 c_2$ are isopotent. In the second set of three groups, (21^2) is isopotent to 16 $\Gamma_2 b$, but they are not isopotent to 16 $\Gamma_2 c_1$.

It is clear that isopotence implies conformality, but not conversely. The exact relationship between the two concepts is not known to the reviewer at this time. If two groups are isopotent they have the same *cycle graph* [1]. We illustrate this in Figures 1 and 2. The group $\mathfrak{M}_{40}$ represents the 16 residue classes prime to 40 under multiplication modulo 40. It is isomorphic to (21^2). The nonabelian group 16 $\Gamma_2 b$ is generated by the permutations:

$$\begin{aligned} \beta &= (abcd)(efgh) \\ \alpha_2 &= (eg)(fh) \\ \alpha_3 &= (ae)(bf)(cg)(dh) \end{aligned}$$

with $\alpha_1 = \beta^2$. An isopotent correspondence is that indicated diagrammatically: $3 \leftrightarrow \beta$, $31 \leftrightarrow \alpha_2$, etc.

The concept of isopotence may already be known, and it may, or may not, be of significance. The reviewer has not examined these questions, but they are not relevant here, since we merely wished to indicate that the tables can be stimulating.

The tables are nicely printed. The lattice diagrams, however, were not drawn by a professional draftsman, and exhibit much shaky lettering and uneven inking. This economy on the part of the publisher is somewhat regrettable, especially since the groups will be with us forever. Nonetheless, the diagrams are legible, and their interest and value are not negated by their lack of artistic perfection.

Apparently the tables were constructed entirely by hand. It would be an interesting challenge to an experienced programmer with the requisite algebraic knowledge and interest to attempt to reproduce and extend these tables with a computer.

Only one typographical error was noted. It is recorded on page 362 of this issue of *Mathematics of Computation*.

D. S.

1. Daniel Shanks, *Solved and Unsolved Problems in Number Theory*, Vol. 1, 1962, Spartan, Washington, pp. 83–103, 112–115, 206–208.

40[G, X].—L. Fox, *An Introduction to Numerical Linear Algebra*, Clarendon Press, Oxford, 1964, xi + 295 pp., 24 cm. Price $8.00.

This is a welcome addition to the growing number of textbooks on matrix computation. It should be quite accessible to students at the junior-senior level, although as a textbook it suffers from having no exercises. There are, however, numerous illustrative examples.

The first two chapters provide a short introduction to numerical analysis, computing and matrix algebra up to, but not including, the Jordan canonical form.

The next six chapters, which comprise the bulk of the book, deal with the linear equation and inverse problems. The usual elimination methods associated with the names of Gauss, Gauss-Jordan, Crout, Cholesky, and Aitken are described in detail, along with methods based on orthogonalization.

There is a comparison of methods and a good elementary introduction to error analysis, which includes such topics as conditioning, rounding error, correction procedures, and effects of perturbations. The section on linear equations ends with a short chapter on iterative methods, including those of Jacobi and Gauss-Seidel.

The last three chapters, about a fourth of the book, are devoted to the eigenvalue problem. The power and inverse power methods as well as the methods of Jacobi, Givens, Householder, and Lanczos are discussed in some detail, and the LR and QR transformations are introduced. There is also a short treatment of error analysis.

At the end of each chapter is an annotated bibliography, which supplements the text with notes on more advanced topics.

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41[G, X].—R. ZURMÜHL, *Matrizen und ihre technischen Anwendungen*, Springer-Verlag, Berlin, 1964, xii + 452 pp., 23 cm. Price DM 36.

This is the fourth edition. The first appeared in 1950, and was given a justifiably enthusiastic review in *MTAC* in 1951 by Olga Taussky. At that time it gave by far the best existing account of numerical methods for inverting matrices and finding proper values and vectors.

Of the 446 pages of text in the present edition, most of the "technical applications" are to be found in the final chapter of 90 pages. The major emphasis is upon theory and upon numerical methods. The theory is well and concisely presented, and successive editions have included the latest in techniques. Innovations appearing in the present edition but not to be found in the third (1960) are Rutishauser's LR transformation and some discussion of vector and matrix norms. Also there is introduced the "Hadamard condition number" of a matrix, which is the ratio of the modulus of the determinant of the matrix to the product of the Euclidean norms of the rows. ALGOL algorithms are introduced in a few places.

The general organization, and the style, remain about the same. There are a number of numerical examples worked out for illustration. The exposition is uniformly good, and very little is presupposed in the way of background. The book should be very useful either as a text or for reference.

A. S. H.

42[K].—TITO A. MIJARES, *Percentage Points of the Sum $V_1^{(s)}$ of s Roots (s = 1–50), A Unified Table for Tests of Significance in Various Univariate and Multivariate Hypotheses*, The Statistical Center, University of the Philippines, Manila, 1964, vii + 241 pp., 27 cm. Price $8.00.

Tables are given for percentage points of the distribution of the sum of the