13[7].—Henry E. Fettis & James C. Caslin, *Table of Modified Bessel Functions*, Report ARL-69-0032, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio, February 1969, iv + 232 pp., 27 cm. Price $3.00. (Obtainable from Clearinghouse, U. S. Department of Commerce, Springfield, Virginia 22151.)

The main table in this report is a photographic reproduction of a manuscript table [1] compiled by the authors in 1967, using an IBM 7094 system. It consists of 15S values of $I_0(x)$ and $I_1(x)$ and their respective products with e^{-x} for $x = 0(0.001)10$.

To this is now appended a 16S table of $I_n(x)$ and $e^{-x}I_n(x)$, for $x = 1(1)10$, $n = x(1)x + 25$. All entries in both tables are given in floating-point form.

The report concludes with a list of terminal-digit errors in Table 9.8 in the NBS *Handbook*, which the authors have previously announced [2], except for one new round-off error; namely, the final digit in the NBS value of $e^{-x}I_1(x)$ for $x = 1$ should read 3 instead of 4.

J. W. W.

1. Henry E. Fettis & James C. Caslin, *Tables of the Modified Bessel Functions* $I_0(x)$, $I_1(x)$, $e^{-x}I_0(x)$, *and* $e^{-x}I_1(x)$, Aerospace Research Laboratories, Wright-Patterson Air Force Base, Ohio, March 1967, deposited in the UMT file. (See *Math. Comp.*, v. 21, 1967, pp. 736–737, RMT **91.**)
2. *Math. Comp.*, v. 22, 1968, p. 244, MTE **418.** (This errata notice is incorrectly cited on p. 4 of the report.)

14[8].—V. I. Pagurova, *A Comparison Test for the Mean Values of Two Normal Samples*, Reports in Computational Mathematics, No. 5, Computing Center of the Academy of Sciences of the USSR, Moscow, 1968, 59 pp. (In Russian.)

Suppose we are given samples of size n_1, n_2 respectively from two (scalar) normal populations. How do we best test whether or not the mean values of the two populations differ, using a criterion conservative enough so that if the means are the same, we decide otherwise at most $\alpha\%$ of the time? If the variances σ_1^2, σ_2^2 of the two populations are the same, this is a standard problem; the best procedure is to calculate a certain statistic ν_1 and then see whether or not $|\nu_1| \geqq f$, where f is the $(1 - \alpha/2)$-percentile of the Student t-distribution with $n_1 + n_2 - 2$ degrees of freedom. The general problem (if the ratio of the variances is unknown) is known as the Behrens-Fisher problem and is much more difficult (there is apparently no best test for all values of the ratio of the variances).

In tackling this problem, the author extends an approach due to the statistician Wald for $n_1 = n_2$. A statistic ν_2 similar to (but not identical with) the statistic ν_1 is found, and also a rejection level $f = f[\eta(c), n_1, n_2, \alpha]$, where n_1, n_2 are the sample sizes, α is a "nominal" level of significance, and c is an estimate (from the data) of $c' = (\sigma_1^2/n_1)/(\sigma_1^2/n_1 + \sigma_2^2/n_2)$. The test $|\nu_2| \geqq f$ then has level of significance of order α, with better approximation for large n_1 and n_2. Indeed, the author tabulates min α and max α, which are the minimum and maximum possible values of the true level of significance of the test over all c', $0 \leqq c' \leqq 1$, for fixed n_1, n_2, α.

For the theoretical arguments behind his approach, see the author's article in *Theor. Probability Appl.*, v. 13, 1968, No. 3 (English translation).

The author gives tables for $f[\eta(c), n_1, n_2, \alpha]$ and min α, max α, for "nominal" $\alpha = 10\%, 5\%, 2\%, 1\%$, and $\frac{1}{2}\%$, $c = 0(.1)1$, $n_1 = 1$, $n_2 - 1 = 3(1)10, 12, 15, 20,$

24, 30, 40, 60, 120, ∞, $n_1 \leqq n_2$. An ALGOL code (in English) is given for the calculation of f, min α and max α, as well as for the $\alpha/2$-percentiles of the Student t-distribution.

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15[9].—JOSEPH B. MUSKAT & ALBERT L. WHITEMAN, *The Cyclotomic Numbers of Order Twenty*, University of Pittsburgh, Pittsburgh, Pennsylvania, and University of Southern California, Los Angeles, California, 40 computer sheets deposited in the UMT file.

This table presents formulas for the cyclotomic numbers of order 20. The derivation and computation of these formulas are described in [1].

The 400 cyclotomic numbers (h, k), $0 \leqq h, k \leqq 19$, can be grouped into 77 sets. There is a formula for each set, a linear combination of the prime p, a constant, and sixteen variables associated with Jacobi sums. The formulas depend, however, on ind 2 (mod 10) et al., so that there are forty different cases. All forty cases are given, one per sheet. Considerably fewer are necessary, for some cases can be derived from others merely by changing the primitive root used in generating the cyclotomic numbers.

AUTHORS' SUMMARY

1. JOSEPH B. MUSKAT & ALBERT L. WHITEMAN, "The cyclotomic numbers of order twenty," *Acta Arithmetica*, v. 17, no. 2, (to appear).

16[12].—R. E. GRISWOLD, J. F. POAGE & I. P. POLONSKY, *The SNOBOL 4 Programming Language*, Prentice-Hall, Inc., Englewood Cliffs, N. J., x + 221 pp., 28 cm. Price $6.50 (paperbound).

SNOBOL 4 is a general-purpose string manipulation language and includes many novel features. Wider use has been hampered by the low availability of information about SNOBOL 4, except for photocopied journal extracts. This book clearly and cleanly fills this gap. It includes descriptions and examples of all currently implemented facilities. Many common problems of SNOBOL 4 users are resolved. Also included are seven complete working programs, although none seem to be real solutions of real problems. The book is aimed at advanced students and those with some programming experience and problems which may be solved by SNOBOL 4, and should hit this target well. It should be read by all with any possible interest in SNOBOL 4.

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17[12].—JOHN A. N. LEE, *The Anatomy of a Compiler*, Reinhold Publishing Corp., New York, 1967, xi + 275 pp., 24 cm. Price $13.75.