

REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

1[A-F, G-I, K, M]—NINA M. BURUNOVA, *Spravočnik po matematičeskim tabličam, Dopolnenie N. 1 (Handbook on Mathematical Tables, Supplement No. 1)*, Izdatel'stvo Akad. Nauk SSSR, Moscow, 1959, 184 p., 26 cm. Price 9 rubles.

This is a first supplement to the important work by Lebedev and Fedorova [1], which appeared in 1956. The arrangement is similar to that of the original, with a Part I in fifteen chapters listing the contents of the various tables, which are referred to by number, and a Part II giving the numbered references, separately for each chapter.

With two small exceptions, the titles of the chapters are unchanged. The translated heading of Chapter IV, formerly "Decimal and natural logarithms," is now simply "Logarithms"; this allows the inclusion of a few tables of logarithms to base 2. Chapter XV, besides the former "Prime numbers, factors, products, quotients and fractions," now covers also "Conversion from one system of numeration to another"; this accommodates a few tables which deal with binary-decimal and similar conversions. A three-page list of functions, giving references to both *Handbook* and *Supplement*, also shows a few additional categories not involving alteration of chapter headings.

As in the original Part II, references to works in Russian are naturally given in Cyrillic characters, but the far more numerous references to other works are given in roman characters. A mathematician knowing no Russian could probably contrive to use the greater part of the book.

Like the original work, the supplement is very welcome.

A. F.

1. A. V. LEBEDEV & R. M. FEDOROVA, *Spravočnik po matematičeskim tabličam*, Moscow, 1956. See RMT 49, MTAC, v. 11, 1957, p. 104-106.

2[A-E, G, J, M, Q]—FRIEDRICH O. RINGLEB, *Mathematische Formelsammlung*, (7th ed.) Sammlung Göschen Band 51/51a, Walter de Gruyter & Co., Berlin, 1960, 320 p., 16 cm. Price DM 3.60.

This little German volume, from the *Sammlung Göschen*, is an enlarged version (42 extra pages, 3 extra figures) of the 1956 edition written by O. Th. Bürkeln. It is a classified collection of formulae and standard theorems from all branches of (essentially) undergraduate mathematics. As such, there is some, but not too much, overlap with similar collections, such as the well-known *Smithsonian Mathematical Formulae*. It is entirely different, however, from the numerical analysis handbook in the Sammlung Göschen, *Formelsammlung zur praktischen Mathematik*, by Günther Schulz.

One (probably not anticipated) use to students of this little book is as a pleasant means of picking up a basic mathematical German vocabulary. The sentences are short, factual, and not unduly encumbered by grammar or philosophy.

The sixteen chapter headings are: Arithmetik und Kombinatorik, Algebra, Zahlentheorie, Elementare Reihen, Ebene Geometrie, Stereometrie, Ebene Trigonometrie, Sphärische Trigonometrie, Mathematische Geographie und Astronomie,

Analytische Geometrie der Ebene, Analytische Geometrie des Raumes und Vektorrechnung, Differentialrechnung, Integralrechnung, Funktionentheorie und konforme Abbildung, Differentialgeometrie, and Differentialgleichungen.

D. S.

3[C, L]—L. K. FREVEL & J. W. TURLEY, "Seven-Place Table of Iterated Log. $(1 + x)$," The Dow Chemical Company, Midland, Michigan, 1960. Deposited in UMT File.

The n -fold iteration of $\log_e(1 + x)$ is explicitly given by

$$x - \frac{nx^2}{2} + \sum_{t=3}^{\infty} \left\{ (-1)^{t-1} n \left[\frac{1}{t} + \frac{n-1}{2} \sum_{\alpha=0}^{t-3} C_{\alpha} n^{\alpha} \right] x^t \right\},$$

where the C_{α} 's are numerical rational fractions. Using nine terms of this expansion the authors have compiled a 7D table containing 4000 different entries for $n = 0(.05)10$ and $x = 0(.05)1..$ All computations were programmed on the DATA-TRON 220, and the output in tabular format was printed directly by a Teletype printer. The recorded values are accurate to $\pm 4 \cdot 10^{-7}$.

AUTHORS' SUMMARY

4[F]—C. L. BAKER & F. J. GRUENBERGER. *The First Six Million Prime Numbers*, The RAND Corporation, Santa Monica, published by The Microcard Foundation, Madison, Wisconsin, 1959, 8 p., 16 x 23 cm. + 62 cards, 7.5 x 12.6 cm. Price \$35.00.

This unusual table is arranged on microcards which present 124 photographs. Each photograph (except the first and last) displays 39 pages of tabulation. Each page lists 1250 prime numbers. The primes range from 1, which is counted as a prime, to 104395289. Each line of a page contains 25 consecutive primes. The first prime in the line is given completely; only the last three digits of the other 24 primes are given. The rank of a prime, once it is located in the table, is given by an obvious formula in terms of its page number, line number, and position in that line. It is just as easy to find isolated values of $\pi(x)$, the number of primes $\leq x$.

It is obvious that the very high condensation of information achieved in this list of primes is not won without some difficulty, namely, the fact that it is invisible to the naked eye. A quite strong pocket magnifying glass or a microcard reading machine is required to read the data. Any use of the table other than finding whether or not a given number is prime or evaluating $\pi(x)$ for isolated values of x is really impractical. For example, to determine the number of twin primes in the 56th million or to calculate a sum involving consecutive primes—problems in which one must carefully keep one's place in the table—would be difficult indeed. Of course, such problems should be done by an electronic digital computer anyway.

There is an interesting description of the IBM 704 program used to generate the list of primes on punched cards, which also contain the differences between consecutive primes.

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EDITORIAL NOTE.—If 2 is counted as the first prime, which is the current practice, then the six millionth prime is 104395301, which happens to be the first member of a prime pair.