Analytische Geometrie der Ebene, Analytische Geometrie des Raumes und Vektor-rechnung, Differentialrechnung, Integralrechnung, Funktionentheorie und kon-forme Abbildung, Differentialgeometrie, and Differentialgleichungen.

D. S.

3[C, L]—L. K. Frevel & J. W. Turley, "Seven-Place Table of Iterated $\log_e$ $(1 + x)$," 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 any-way.

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.

D. H. Lehmer

University of California
Berkeley, California

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.