REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

The numbers in brackets are assigned according to the indexing system printed in Volume 28, Number 128, October 1974, pages 1191–1194.

13[7.55].—HERBERT E. SALZER & NORMAN LEVINE, *Tables of* $2^{-r+1}{}_rC_{(r-k)/2}$, ms of 4 pp. + 65 tabular pp. (unnumbered) 8½″ × 14″, deposited in the UMT file.

A polynomial $P_n(x) \equiv c_0 + c_1x + \cdots + c_nx^n$ is expressible as a Chebyshev series $\frac{1}{2}a_0T_0(x) + a_1T_1(x) + \cdots + a_nT_n(x)$ or $\frac{1}{2}a_0^*T_0^*(x) + a_1^*T_1^*(x) + \cdots + a_n^*T_n^*(x)$, where $T_k(x) = \cos(k \arccos x)$, $T_k^*(x) = T_k(2x - 1)$, $a_k = \Sigma_{r=k}^n c_rd_{r,k}$, and $a_k^* = \Sigma_{r=k}^n c_rd_{2r,2k}$, $k = 0(1)n$. Here $d_{r,k} = 2^{-r+1}{}_rC_{(r-k)/2}$ for $r - k$ even, and $d_{r,k} = 0$ for $r - k$ odd.

The first of the two tables in this manuscript gives $d_{2r,2k}$ to 35S, in floating-point form, for $r = k(1)50$, $k = 0(1)50$; the second gives $d_{r,k}$ to the same precision for $r = k(2)99$, $k = 1(2)99$.

In the four-page introduction the senior author includes a description of a more efficient method [1] for the calculation of the coefficients a_k and a_k^*, which he discovered after the computation of these tables and which he attributes originally to Hamming [2], [3].

J. W. W.

1. H. E. SALZER, "A recurrence scheme for converting from one orthogonal expansion into another," *Comm. ACM*, v. 16, 1973, pp. 705–707.

2. R. W. HAMMING, *Numerical Methods for Scientists and Engineers*, McGraw-Hill, New York, 1962, pp. 255–257.

3. R. W. HAMMING, *Introduction to Applied Numerical Analysis*, McGraw-Hill, New York, 1971, pp. 305–306.

14[9].—J. S. DEVITT, *Some Tables for Aliquot Sequences*, Res. Report CORR 77-41, Faculty of Math., Univ. of Waterloo, Waterloo, Ont., Canada, Sept. 1977, 55 pp., 27.5 cm. Copy deposited in the UMT file.

The *aliquot n-sequence* is $n_0 = n$, $n_{i+1} = \sigma(n_i) - n_i$ where $\sigma(n)$ is the sum of divisors function. Such sequences are *terminating* if they contain a term 1, *periodic* if they contain a perfect number, amicable pair or other cycle, and *unbounded* otherwise. The existence of unbounded sequences is an open question; sequences not known to be terminating or periodic are *incomplete* (at b, where the last calculated term exceeds b). An m-sequence is *tributary* to an n-sequence if $m > n$ and the sequences have a common term greater than all previous terms of either sequence. A sequence is called *main* if it is not *known* to be tributary. The main n-sequences with $n < 1000$ which are incomplete (at 10^{30}) were mostly calculated by D. H. Lehmer [author, reviewer and J. L. Selfridge, Proc. 6th Manitoba Conf. Numerical Math., 1976, pp. 177–204] and are 276, 552, 564, 660, 840 and 966. Recently M. C. Wunderlich (written communication) has shown that the 276-sequence is incomplete at 10^{44}:

$$276{:}469 = 276_{469} = 14938\ 48465\ 98254\ 84424\ 39056\ 95992\ 65141\ 29198\ 55640.$$

The tables of the title are part of the author's MSc thesis [Univ. of Calgary, 1976]. They enable the reader to discover the known behavior of all n-sequences with $n < 10^5$. If a sequence does not have a term exceeding 10^6 it is called *trivial* and a sequence having such a term before it becomes tributary is called *major.* Table A contains 2212 entries, one for each major sequence with $n < 10^5$: U if the sequence is incomplete at 10^{18}; T if the sequence terminates; P if it is periodic; – if it is tributary. Table B is of 2212 10^6 *bounds.* The first term of a sequence greater than 10^6 is listed with the major sequence leading to that bound. Table C lists the maximum, the first member of the cycle and the length of 28 major periodic sequences. Table D lists the maximum, the prime and the length of 636 main terminating sequences. All other major sequences with $n < 10^5$ are tributary; Table E lists 411 such, with the sequences to which they are tributary and the distances along each sequence before they join. An example of the use of the tables is given: 44156 does not appear in Table A, so we calculate its 10^6 bound, 44156:8 = 1163288. In Table B we find 1163288 30324, so 44156 is tributary to 30324. Table A has the entry 30324 –, so in Table E we find 30324:29 = 138:4, i.e. that 30324 was tributary to 138, its 29th term being the 4th of 138. Finally, Table A lists 138 T and Table D lists the maximum

$$17\ 99318\ 95322 = 138{:}117 = 2.61.929.1587569,$$

the length 177 and the prime 59 of the 138-sequence.

Tables F, G, H, I have similar information to that in Table A for n-sequences, $n = 10^k + 2m$, $1 \leqslant m \leqslant 500$ and $k = 9, 10, 11, 12$. This is summarized in Table 5.2 of the author's thesis:

n even	$\leqslant 10^4$	$k = 9$	$k = 10$	$k = 11$	$k = 12$
Incomplete at 10^{18}	803	332	350	357	383
Terminating	4044	161	146	139	113
Periodic	153	7	4	4	4
Total	5000	500	500	500	500

Richard K. Guy

The University of Calgary
Calgary, Alberta, T2N 1N4, Canada

15[9].—Harold M. Edwards, *Fermat's Last Theorem. A Genetic Introduction to Algebraic Number Theory,* Springer, New York, 1977, 410 pp. Price \$19.80.

If someone opens this book expecting a report on the most recent progress on Fermat's Last Theorem, he will be rather surprised. Instead, he will find a very inter-