$$\theta_p \approx \pi/3, 2\pi/3,$$

since

$$\tau(p^2) = (\tau(p))^2 - p^{11}$$

and therefore $\tau(p^2)$ is relatively very small. An early example is

$$\tau^*(11) = 1.0087, \qquad \tau^*(121) = 0.00175,$$

but these values are more difficult to pick out merely by glancing down the column of $\tau(n)$.

Subsequently, the original table deposited was replaced by a second that also lists the summatory function $\sum^N \tau(n)$.

D. S.

1. S. RAMANUJAN, "On certain arithmetical functions," *Trans. Cambridge Philos. Soc.*, v. 22, 1916, pp. 159–184; see especially §§16–18. A short table of $\tau(n)$ for $n = 1(1)30$ is given here.
2. G. N. WATSON, "A table of Ramanujan's function $\tau(n)$," *Proc. London Math. Soc.*, (2), v. 51. 1950 (paper is dated 1942), pp. 1–13.
3. D. H. LEHMER, *Tables of Ramanujan's* $\tau(n)$, UMT **101**, *MTAC*, v. 4, 1950, p. 162.
4. MARGARET ASHWORTH & A. O. L. ATKIN, *Tables of* $p_k(n)$, UMT **1**, *Math. Comp.*, v. 21, 1967, p. 116.
5. G. H. HARDY, *Ramanujan*, Chelsea reprint, New York, 1959, Chapter X and §§9.17, 9.18.

42[9].—PAUL TURÁN, Editor, *Number Theory and Analysis—A Collection of Papers in Honor of Edmund Landau* (1877–1938), Plenum Press, New York, 1969, 355 pp., 24 cm. Price $19.50.

There are 22 papers here in number theory and analysis in honor of Landau by E. Bombieri, H. Davenport, B. M. Bredihin, J. V. Linnik, N. G. Tschudakoff, J. G. van der Corput, M. Deuring, P. Erdös, A. Sárközi, E. Szemerédi, H. Heilbronn, E. Hlawka, A. E. Ingham, V. Jarnik, S. Knapowski, P. Turán, J. Kubilius, J. E. Littlewood, L. J. Mordell, G. Pólya, J. Popken, H. Rademacher, A. Rényi, I. J. Schoenberg, C. L. Siegel, Arnold Walfisz, and Anna Walfisz.

There also is a joint paper by Davenport and Landau himself: "On the representation of positive integers as sums of three cubes of positive rational numbers". Davenport explains: "This paper was written, in a rough form, in February 1935, when Landau visited Cambridge . . . As far as I can recollect, the reason why the paper was not published. . . ." Unfortunately, Landau is not the only departed author here, since one must add Ingham, Knapowski, Arnold Walfisz, Rademacher, and Davenport.

The papers are in English and German. The volume first appeared in Germany with the title "Abhandlungen aus Zahlentheorie und Analysis zur Erinnerung an Edmund Landau (1877–1938)". It includes a photograph of Landau, a short foreword by Turán, and a list of Landau's seven books and his 254 papers (not counting the one here).

Landau's first two papers (published at age 18) were on chess, but with the third he begins his real life work. It is his well-known 1899 Inaugural Dissertation: "Neuer Beweis der Gleichung $\sum_1^\infty \mu(k)/k = 0$". Landau liked to joke about this paper. "Gordan pflegte etwa zu sagen: 'Die Zahlentheorie ist nützlich, weil man nämlich mit ihr promovieren kann'. Ich habe mit einer Antwort auf diese Frage 1899 promoviert."

The lead-off paper in the book is by Bombieri and Davenport, "On the large sieve method". Most of the other papers are on number theory, but (about) $1/\pi$ of them are on analysis, more exactly, 7 out of 22 of them.

D. S.

43[10]—ROBERT SPIRA, *Cyclotomic Polynomial Generator and Tables*, Version A, Michigan State University, East Lansing, Mich., October 1969, 45 pp., 28 cm., deposited in UMT file.

This is an emended version of an undated report released several months earlier, which was found to contain several serious typographical errors in the arrangement of the tabular entries.

The numerical table herein consists of a parallel listing of values of the Euler totient, $\phi(n)$ and of the coefficients of the cyclotomic polynomial $Q_n(x)$ for $n = 1(1)250$. (This polynomial is defined as the irreducible monic polynomial of degree $\phi(n)$ that has as its zeros the primitive nth roots of unity.)

This main table is preceded by a detailed description (including flow charts and listings) of the four FORTRAN programs used in the calculations.

The introduction describes the mathematical procedure followed in the generation of the cyclotomic polynomials, which the author ascribes to Lehmer [1].

J. W. W.

1. D. H. LEHMER, *Guide to Tables in the Theory of Numbers*, Bulletin No. 105, National Research Council, Washington, D. C., 1941, p. 73.

44[12]—J. HILSENRATH, G. G. ZIEGLER, C. G. MESSINA, P. J. WALSH & R. J. HERBOLD, *Omnitab, A Computer Program for Statistical and Numerical Analysis*, National Bureau of Standards Handbook No. 101, 1966, reissued 1968 with corrections, lx + 275 pp., 26 cm. Price $3.00.

Computing has come a long way from the early beliefs of von Neumann that a computer user will be a scientist who will know the range of every number entering in his calculation, and who will be so motivated that machine language programming will present no problem. In fact, even the use of floating-point arithmetic was considered to be "playing with fire". Today we find a veritable Tower of Babel of languages, collections of algorithms, subroutine libraries and operating systems, and the promise of a console in every home for doing Junior's homework and to facilitate menu preparation. It is therefore hard to realize that there exist large numbers of problem-oriented research people who want access to a large digital computer, but who do not want to learn programming, for example, they may just want "a least-squares fit". For these people large numbers of packages and "general-purpose" systems have been devised.

OMNITAB, developed by the Statistical Engineering Laboratory of the National Bureau of Standards, is a completely assembled interpretive program which provides facilities for doing a wide range of statistical and engineering type calculations. Originally written for the IBM 7090/7094, this volume is a manual for users with access to a computer with the OMNITAB system and indicates in detail the necessary