89[F].—M. LAL, M. F. JONES & W. J. BLUNDON, *Tables of Solutions of the Diophantine Equation* $Y^3 - X^2 = K$, Department of Mathematics, Memorial University of Newfoundland, St. John's, Newfoundland, Canada, 1965, iii + 162 pp., 28 cm. Price $10.00.

Nicely printed and bound are the following three tables:

Table 1: The 5370 solutions of

$$y^3 - x^2 = k \tag{1}$$

with $0 \leqq x < 10^{10}$ and $-10^4 < k < 0$.

Table 2: The 3223 solutions of (1) with $0 < k < 10^4$ and the same range of x. (Actually, there are no solutions for $9989 < k < 10^4$.)

Table 3: The number of solutions for each k in the previous two tables. (Although the text indicates that $k = 0$ was not done, it appears that it really was, since we find here that there are 2155 solutions for $k = 0$, which number is, in fact, $[10^{10/3}] + 1$.)

Most previous authors have used the notation $y^2 - k = x^3$, and it may be hoped that the present changes will not cause too much confusion. However, perhaps that is too much to expect, since even the authors write "for $0 < k \leqq -100$, all solutions of (1) have been found." (When taken literally, this would appear to be a very minor accomplishment.)

The tables are prefaced by (essentially) the authors' note previously appearing in this journal [1]. It is known from Hemer [2], (but see the account of his earlier errata in the *MTAC* review of his [3]), that there are no other solutions of (1) for $-10^2 < k < 0$. But for $0 < k < 10^2$ there are 20 cases [4] whose completeness is in doubt. The authors surmise that their table is nonetheless complete here also. They obtain no new solutions for $0 < k < 10^2$ not already listed in [2].

The authors do not mention the earlier work of Robinson [5] concerning $|y^2 - x^3| < x$ for $0 \leqq y < (\frac{1}{27}) \times 10^9$, which preceded [2], and led to corrections there [3]. The present table contains no other solutions for $-225 < k < 207$ of the type tabulated by Robinson in spite of their substantially greater range of what they call x and he calls y. For a greater range of k, namely, $-1000 \leqq k \leqq +1000$, I find that the present table picks up only 6 new solutions not in Robinson:

k	y	x
-618	421351	273505487
-353	117188	40116655
-225	720144	611085363
207	367806	223063347
307	939787	911054064
847	657547	533200074

It may well be, therefore, that the present table is complete for $-200 \leqq k \leqq 200$.

The new solution for $k = -618$ may be of some special interest, since the only other solution for that k is the very small $7^3 = 31^2 - 618$. Another solution found in the table is a pleasant Fermat Frustrater:

$$11^3 + 37^3 = 228^2.$$

The reviewer notes that when there are many solutions for some k, say 8 or more, then usually there are none at all for $-k$.

The programming for these tables is, of course, quite simple. A real challenge to number-theoretically inclined programmers would be to program the *theory* necessary for showing completeness, at least in the easier cases for negative k.

D. S.

1. M. Lal, M. F. Jones & W. J. Blundon, "Numerical solutions of the Diophantine equation $y^3 - x^2 = k$," *Math. Comp.*, v. 20, 1966, pp. 322–325.
2. O. Hemer, "Notes on the Diophantine equations $y^2 - k = x^3$," *Ark. Mat.*, v. 3, 1954, pp. 67–77. See also RMT **1208**, *MTAC*, v. 8, 1954, pp. 149–150.
3. Ove Hemer, *On the Diophantine Equation $y^2 - k = x^3$*, Uppsala, 1952. See also RMT **1068**, *MTAC*, v. 7, 1953, p. 86.
4. W. Ljunggren, "On the Diophantine equation $y^2 - k = x^3$," *Acta Arith.*, v. 8, 1963, pp. 451–463.
5. R. Robinson, "Table of integral solutions of $| y^2 - x^3 | < x$," UMT **125**, *MTAC*, v. 5, 1951, p. 162.

90[H, X].—J. H. Wilkinson, *The Algebraic Eigenvalue Problem*, Oxford University Press, New York, 1965, xviii + 662 pp., 25 cm. Price $17.50.

This excellent book is the work of an expert. He has given a unified treatment of the theoretical and practical aspects of the algebraic eigenvalue problem.

The reader will find this presentation to be clear, complete and up to date. Several of the author's recent results appear here for the first time. The simple listing of the chapter headings may indicate the scope of the work:

1. Theoretical Background
2. Perturbation Theory
3. Error Analysis
4. Solution of Linear Algebraic Equations
5. Hermitian Matrices
6. Reduction of a General Matrix to Condensed Form
7. Eigenvalues of Matrices of Condensed Forms
8. The LR and QR Algorithms
9. Iterative Methods

In the preface the author states, "The eigenvalue problem has a deceptively simple formulation and the background theory has been known for many years; yet the determination of accurate solutions presents a wide variety of challenging problems." He then systematically disposes of most of the problems. E. I.

91[I].—K. A. Karpov, *Tables of Lagrange Interpolation Coefficients*, The Macmillan Company, New York, 1965, viii + 75 pp., 25 cm. Price $5.75.

This book, which is Volume 28 of the Pergamon Press Mathematical Tables Series, is an attractively printed and bound English translation by D. E. Brown of the Russian *Tablitsy Koéffitsientov interpoliatsionnoĭ Formuly Lagranzha*, published in 1954 by the Academy of Sciences, U.S.S.R. and reviewed in this journal [1].

An appropriate reference that has appeared since the original edition of this book is the tables of Karmazina & Kurochkina [2].

J. W. W.

1. *MTAC*, v. 11, 1957, pp. 209–210, RMT **85**.
2. L. N. Karmazina & L. V. Kurochkina, *Tablitsy interpoliatsionnykh koéffitsientov*, Academy of Sciences of the USSR, Moscow, 1956. See *MTAC*, v. 12, 1958, p. 149, RMT **66**.