Review
Author(s): A. E. Western
Review by: A. E. Western
Source: *The Mathematical Gazette*, Vol. 3, No. 49 (Jan., 1905), p. 138
Published by: Mathematical Association
Stable URL: http://www.jstor.org/stable/3602739
Accessed: 24-12-2015 02:55 UTC

REVIEWS.

Quadratic Partitions. By Lieut.-Col. ALLAN CUNNINGHAM, R.E. Pp. xxiii and 266. 12s. 1904. (Francis Hodgson.)

This book mainly consists of tables of the solutions of

$$t^2 + Du^2 = p,$$

where D is any positive or negative number less than 20, and p is a prime number; t and u are the "unknowns" which are given in the tables. For given values of D, and p, the equation may be impossible, and in that case the tables state the fact. If the equation is possible, and D is positive, the Theory of Numbers shews that the solution is unique. But if D is negative and the equation is possible, there is an infinite number of solutions, all of which can be derived from any one of them. In this case the author gives the least solution. The principal table gives the solutions for the important cases $D = 1$, 2, and 3, for all values of p up to 100,000. The only previous tables for these values of D are now difficult to obtain, and are of much smaller extent than the present table, being complete only up to about 13,000. The introduction gives an interesting account of some of the uses in the Theory of Numbers to which the tables can be put.

No one can adequately conceive the labour involved in the calculation of these tables, unless he has himself tried to solve such equations. For some values of D, Gauss, Jacobi, and others have found explicit solutions.

For instance, if $p = t^2 + u^2$, where t is odd, and $p = 4n + 1$, then $t \equiv \frac{1}{2} \frac{2n!}{n!\,n!}$, mod. p; this is theoretically important, but (like most direct methods in the Theory of Numbers) quite impracticable for the purpose of calculating t. Consequently the solutions for each p have to be found individually by a process of trial. We would suggest to the author the desirability of putting his methods on record in any future edition or extension of these tables. We are glad to see it stated in the Introduction that the author (who in 1900 published a "Binary Canon," shewing residues of powers of 2, mod. p) has in preparation other tables relating to the Theory of Numbers. A. E. WESTERN.

Leçons de Trigonométrie rectiligne. By C. BOURLET. Pp. 322. 1904. 6 francs. (Paris, Colin & Cie.)

This work is one of the series of elementary mathematical text-books edited by M. Darboux. Its three parts include the properties of triangles and quadrilaterals with their associated circles; there is also an appendix on the graphical representation of complex quantities, De. Moivre's theorem, the trigonometrical functions of submultiple angles, and the solution of binomial, quadratic, and cubic equations.

The book may with advantage be put into the hands of a clever schoolboy who has acquired a considerable knowledge of the subject from more elementary text-books. It is clear, suggestive, and very complete; for instance, three different ways of solving $a \cos x + b \sin x = c$ are discussed at length. Examples for the student are scarce; there are only 105, including those in the appendix. The author begins with definitions of vectors and projections, and develops his subject on the lines suggested in the *Mathematical Gazette* of October, 1904, pp. 82 to 85. Particularly interesting are the chapters on the solution of