

Hardy and Littlewood had earlier derived the result that every sufficiently large odd number is the sum of three odd primes, but under the assumption of an unproved theorem concerning the distribution of zeros of a certain transcendental function. Since Schnirelmann, Winogradoff has proved the Hardy-Littlewood theorem without any unproved assumption, thus including both the Hardy-Littlewood theorem and Schnirelmann's result. This is the present status of Goldbach's conjecture that every even number greater than 4 is the sum of two odd primes.

The theorems of Chapters 3 and 4 are of a newer and less well known type than those of the first two chapters. An illustration is the following theorem:

THEOREM 96 (Khintchine-Erdős). *Let \mathfrak{A} be a set of positive integers a , and let \mathfrak{B} be a set of positive integers b enjoying the property that a certain positive integer l exists such that every positive integer is a sum of l or fewer numbers b . Let \mathfrak{C} be the set of all numbers of the form a or $a+b$, $A(x)$ the number of a 's $\leq x$, $S(x)$ the number of s 's $\leq x$, and, for some α , ($0 < \alpha < 1$), $A(x) \geq \alpha$ for all x greater than zero. Then, for all $x > 0$, $S(x) \geq \alpha(1 + (1 - \alpha)/2l)x$.*

The proof of this theorem is extremely short and involves a minimum of mathematical prerequisites. It gives almost the impression of an exercise in formal logic.

By specializing the set \mathfrak{B} , many important results are obtained, such as:

For a given positive integer $a > 1$ and for a positive integer $x > 2$, the number of solutions of $p + i^a \leq x$, p a prime, for any integer $i > 0$, is greater than $x/c(a)$, where $c(a)$ is a constant dependent only on a ; and a similar theorem for $p + a^i \leq x$.

To another theorem by Khintchine, Theorem 110, which belongs to the same general range as Theorem 96, Landau pays the compliment: "Der Kintchinesche Beweis ist elementar und doch ein sehr kompliziertes grosses Kunstwerk."

This book is a fitting memorial to a mathematician who was at the same time a leader in research and unsurpassed in his ability and eagerness to make the most advanced work done by others available to a larger group.

A. J. KEMPNER

Zur Differentialgeometrie der Kurven und Flächen fester Breite. By Hans Bückner. (Schriften der Königsberger gelehrten Gesellschaft, vol. 14, no. 1.) Halle, Niemeyer, 1937. 22 pp.

This pamphlet gives a readable and very brief account of this subject, based on the support function of the curve or surface. New results include lower bounds for the area of a surface of constant breadth and for length of a space curve of constant breadth; characterization of a curve of constant breadth as an oval for which any two of the support normals intersect within the closed region bounded by the curve; an analogous result for surfaces; and an equation connecting lengths and areas of the two parts into which a support normal divides a curve of constant breadth and the included area.

E. H. CUTLER

The Theory and Construction of Nondifferentiable Functions. By A. N. Singh. (Lucknow University Studies, no. 1, Faculty of Science, Session 1934-1935.) Lucknow, Newul Kishore Press, 1935. 7+110 pp.

The author of this tract has published numerous papers on nondifferentiability and curves without tangents since 1924, mostly in Indian periodicals, though a couple of papers have found their way to this country. In the present volume, which is based