

Without (A), $m^2 > \aleph_0$ implies $m > \aleph_0$. But without (A) we cannot prove that $m^2 > n^2$ either implies or is implied by $m > n$ (p. 149).

Without (A) we can prove that the set of all infinite sequences of real numbers is of power \mathfrak{c} , but without (A) we are unable to prove that the set of all denumerable sets of real numbers is of power \mathfrak{c} (p. 112).

The order types $\alpha = \omega\eta$ and $\beta = \omega(\eta + 1)$ satisfy $\alpha^2 = \beta^2$ and $\alpha \neq \beta$. But it is an open question whether there exist order types γ and δ for which $\gamma^2 = \delta^2$ and $\gamma^2 \neq \delta^2$ (p. 232).

Fermat's last theorem is false for order types (p. 232), and for ordinals with transfinite exponent (p. 318). Fermat numbers, i.e. ordinals of the form $2^{2^\alpha} + 1$, are prime for every transfinite ordinal α (p. 339).

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Gitterpunkte in mehrdimensionalen Kugeln. By A. Walfisz. Monografie Matematyczne, vol. 33. Warszawa, Państwowe Wydawnictwo Naukowe, 1957. 471 pp.

This is a beautifully written book by a leading expert in the field. Although of immense value to the specialist, it is addressed to a wider circle of readers. To quote the author's own words, "Das Studium des Buches setzt nur Kenntnisse voraus, wie sie in den üblichen Anfängervorlesungen über Analysis, Algebra und Zahlentheorie an den Hochschulen gegeben werden. Auch sind die Rechnungen über all sehr eingehend durchgeführt." Almost a third of the book is devoted to researches of the last ten years.

The book is concerned with the study of $P_k(X)$, which is the difference between the number of lattice-points in the k -dimensional hypersphere

$$(1) \quad y_1^2 + y_2^2 + \cdots + y_k^2 \leq X$$

and its volume $V_k(X)$. So

$$(2) \quad P_k(X) = A_k(X) - V_k(X)$$

where $A_k(X)$ is the number of lattice-points satisfying (1). It is well-known that we have the asymptotic relation $A_k(X) \sim V_k(X)$.

Gauss observed that $P_2(X) = O(X)^{1/2}$. Sierpinski (1909) found $P_2(X) = O(X^{1/8})$, van der Corput proved the sharper result $P_2(X) = O(X^c)$ and $c < 1/3$ and there have been petty improvements in the exponent in later years. It is also known (Hardy) that the exponent cannot be lowered below $1/4$; on the other hand it is considered highly