
Zbl 314.10040

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Conditions for a zero sum modulo n. (In English)

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The authors use a theorem of *J. H. B. Kemperman* and *P. Scherk* [Canadian J. Math. 6, 238-252 (1954; Zbl 058.01901)] on the addition of residue classes (related to the well known Cauchy-Davenport theorem) to prove the following result. Let $n > 0$, $k \geq 0$, $n - 2k \geq 1$. Then if $a_1, \dots, a_{n-k}$ are any integers not more than $n - 2k$ of which lie in the same residue class $(\mod n)$, then there is a non-empty subset I of $\{1, 2, \dots, n-k\}$ such that $\sum_{i \in I} a_i \equiv 0 (\mod n)$. This result is best possible in the sense that if $n \geq 3k - 2$ then the conclusion is not true if we allow $n - 2k + 1$ of the integers to lie in the same residue class.

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Classification:
11B13 Additive bases