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Sumsets containing infinite arithmetic progressions. (In English)

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The authors prove some quantitative results on infinite arithmetic progressions contained in sumsets of sets A (of nonnegative integers) of positive lower asymptotic density w. If k is the smallest integer such that $k \geq 1/w$, it is proved (i) that there is an infinite progression with difference at most $k+1$ such that every term of the progression can be written as a sum of exactly k^2-k distinct terms of A, (ii) there is an infinite arithmetic progression with difference at most k^2-k such that every term of the progression can be written as a sum of exactly $k+1$ distinct terms of A. A solution is also shown to the infinite analog of two problems of Erdős and R. Freud on the representation of powers of 2 and square-free numbers as bounded sums of distinct elements chosen from a set with specified positive density.

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