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Some new results in probabilistic group theory. (In English)

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Let G be an Abelian group of n elements. Assume that for each fixed l the number of elements of order l is $o(n)$ as $n \rightarrow \infty$. Let $k = \frac{\log n}{\log 2} + o(1)$. Choose k elements of G at random. Let these elements be g_1, \dots, g_k and denote by $R(g)$ the number of solutions of $g = \sum_{i=1}^k \varepsilon_i g_i$, $\varepsilon_i = 0$ or 1 . Denote finally by $d(r)$ the number of elements of G with $R(g) = r$. The authors prove (among others) that of reach fixed $rd(r) = (1+o(1))ne^{-\lambda} \lambda^r = \frac{2^k}{n}$, with probability tending to 1 as $n \rightarrow \infty$. Several applications and unsolved problems are discussed.

Classification:

20P05 Probability methods in group theory

20D99 Abstract finite groups

20K99 Abelian groups