

Arithmetic progressions in 2-groups

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Let G be a finite group. A subset $A \subset G$ is called progression-free, if $ab = c^2$ for $a, b, c \in A$ implies $a = b = c$. We discuss the maximal possible size $r(G)$ of a progression-free subset of a group G . This subject was initiated by a recent breakthrough paper of E. Croot, V. Lev and P. Pach, where the bound $r(C_4^n) < 3.611^n$ is proved by using the polynomial method. It implies that $r(C_8^n) < 7.222^n$, but using the group rings approach we manage to improve this exponentially. The talk is based on a current work in progress joint with C. Pohoata.

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