Graduate Theoretical Computer Science and Combinatorics Seminar

On the Problem of Power-Free Subsets

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Abstract: In 1965, Paul Erdos easily proved that if S is a finite set of nonzero real numbers, then there exists a sum-free subset $S' \subseteq S$ such that $|S'| \geq \frac{1}{3}|S|$. Here, a sum-free subset S is such that there is no triple of elements a, b, c in S for which $a + b = c$. Eberhard, Green and Manners proved in 2013 that the same is not true for a constant bigger than $\frac{1}{3}$, i.e. $\frac{1}{3}$ is the biggest possible constant with this property. Here, we consider the analogous problem where triples a, b, c in S for which $a^b = c$ are forbidden. We show that $\frac{1}{8}$ is a lower bound for the optimal constant (private communication with Noga Alon), as well as that $\frac{1}{2}$ is an upper bound for it.

Tuesday, October 22 at 5:00 PM in 512 SEO