

Graphs and Partition Regular Systems of Equations

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If G is a large K_k -free graph, by Ramsey's theorem, a large set of vertices is independent. For graphs whose vertices are positive integers, much recent work has been done to identify what arithmetic structure is possible in an independent set. Here we address three similar problems: for graphs whose vertices are affine points in a vector space over a finite field, for graphs whose vertices are 1-dimensional linear subspaces of such a vector space, and when the vertices of the graph are elements of an arbitrary abelian group, and we discuss relations to the solutions of partition regular systems of equations.