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Graph Properties, Polynomials, and Simplicial Complexes

An independent set in a graph is a set of vertices no two of which are adjacent, but can be thought of as an induced subgraph that has the property of not containing an induced copy of K_2 . Recent work has generalized this idea to define a P -set to be a subgraph that does not contain an induced copy of a specified list of graphs defined by P , a graph property. From this point of view we can generalize simplicial complexes and polynomials associated with independence to the P -generating polynomial and P -complex of a graph for any such graph property P . We provide general results about the P -generating polynomials and their roots, consider specific properties, and examine the connections between simplicial complex theory and the P -complex. (This is a joint work with Jason Brown.)