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Crapo's Beta Invariant for Matroids

Abstract for the Combinatorics Seminar 2013 November 19

A matroid is an abstraction of linear independence of a finite set of vectors. There is a numerical invariant β of a matroid that has many useful implications. For instance, it tells whether the matroid splits into smaller matroids. After setup and a few results (regarding items such as partial differentiation on a rank function and factorization of matroids), I will define β, prove several nice properties, and do some calculations.

The talk will continue into a second half, where I will prove some of the deeper properties of β such as its non-negativity and duality invariance. I will also discuss connections between β and the more familiar Tutte polynomial and rank generating polynomial, and give some more complex computations regarding β for several different classes of matroids.

This is Mr. Schaefer's examination for Admission to Candidacy. The examining committee is Laura Anderson, Vaidy Sivaraman, and Thomas Zaslavsky (chair).
