

“Combinatorics”

Problem Set 8

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Version date: June 19, 2007
Issue date: June 19, 2007
Hand in date: June 27/28, 2007

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<http://carsten.codimi.de/comb07/>

9. Polytopes, Arrangements

31. Show that the intersection of any two faces of a polytope is again a face.
32. Let P be a stacked d -polytope on k vertices. Calculate the f -vector of P .
33. (i) Describe the combinatorial type of the 3-dimensional hypersimplex $\Delta_3(2)$.
(ii) Show that each face of a hypersimplex is again a hypersimplex. How many faces of each type does $\Delta_{d-1}(k)$ have? What is its f -vector?
34. Show that the intersection lattice of the braid arrangement in \mathbb{R}^n is isomorphic to Π_n .