

1152-05-42

Galen Dorpalen-Barry, Jang Soo Kim and Victor Reiner* (reiner@umn.edu), School of Mathematics, University of Minnesota, 206 Church St SE, Minneapolis, MN 55455. *Whitney numbers for poset cones.*

A well-known theorem of Zaslavsky counts chambers in a hyperplane arrangement as a sum of positive integers called Whitney numbers of the first kind. It is less well-known that he generalized this to count chambers inside any cone defined by halfspaces of arrangement, giving rise to Whitney numbers for cones.

Specializing to the braid arrangement, that is, the hyperplanes $x_i = x_j$ inside \mathbf{R}^n , the cones correspond to posets, and chambers inside the cone correspond to linear extensions. Thus the Whitney numbers of the cone refine the number of linear extensions of the poset.

We combinatorially interpret these Whitney numbers for posets in general via an interesting bijection. For posets which are disjoint unions of chains, we also show how Foata's theory of cycle decomposition for multiset permutations gives a different interpretation, and leads to a simple generating function that compiles these Whitney numbers. (Received August 09, 2019)