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The Order Dimension of Bruhat Order

Abstract for the Combinatorics and Number Theory Seminar 2003 May 6

I consider the order dimension of infinite Coxeter groups under strong Bruhat order. In particular, I show that the order dimension of the affine Coxeter group A_n is at least $n(n+1)$. To accomplish this, I exhibit an antichain of certain special elements called dissectors. I describe these dissectors in terms of rectangles within a specified array of generators in order to establish that we have an antichain and count its elements. I then use the fact that the order dimension $\dim(P)$ of a finitary poset P is at least the width of the subposet $\text{dis}(P)$ of its dissectors.

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