

1112-05-75

Jia Huang, Joel Brewster Lewis* (jblewis@math.umn.edu), **Alejandro H. Morales** and **Victor Reiner**. *Absolute order in general linear groups.*

We study a partial order on the general linear group $GL(V)$ called the *absolute order*, derived from viewing $GL(V)$ as a group generated by reflections, i.e., elements whose fixed space has codimension one. The absolute order can be characterized in two equivalent ways, one via additivity of length for factorizations into reflections, the other via additivity of fixed space codimensions. We discuss some general properties of this order, including self-duality of its intervals.

Working over a finite field \mathbb{F}_q , we show via a complex character computation that the poset interval from the identity to a Singer cycle (or any regular elliptic element) in $GL_n(\mathbb{F}_q)$ has a strikingly simple formula for the number of chains passing through a prescribed set of ranks. More generally, we discuss generating function formulas counting arbitrary factorizations of regular elliptic elements in $GL_n(\mathbb{F}_q)$, keeping track of the fixed space codimensions of the factors. (Received July 15, 2015)