

2009:6
Självständigt arbete i matematik
Matematiska institutionen
Stockholms universitet

Maxim Chapovalov: Explicit growth functions of the Coxeter groups of Lannér and quasi-Lannér type

Handledare: Dmitry Leites

Sammanfattning

In 1950, in Medd. Lunds Univ. Mat. Sem., Lannér classified Coxeter groups whose Coxeter diagram without one vertex is a disjoint union of Coxeter diagrams of spherical type. In 1980s, Vinberg and Shwartzman classified Coxeter groups of quasi-Lannér type whose Coxeter diagram without one vertex is a disjoint union of Coxeter diagrams of spherical or Euclidean type.

Solomon proved (1966) that the growth function of any Coxeter group is a rational function. The growth functions of Coxeter groups of spherical or Euclidean type are known. Here we give the explicit expressions of the growth functions of (quasi-)Lannér groups. For the Lannér groups with 4 and 5 generators, these series are known thanks to Worthington (1988) but, for 3 of 5 cases of the Lannér groups with 5 generators, his results are wrong. For quasi-Lannér groups, our results are new as well as corrected answers for Lannér groups.

We offer the virgin form of the growth function as a reliable tool for verification of results; it also helps to get an explicit expression of the zeros of the growth function.

The non-real poles of the growth functions of quasi-Lannér groups lie in a narrow annulus, as in the famous Eneström theorem, although the coefficients of the denominators of the growth functions do not satisfy conditions of Eneström's theorem.