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ON EXPONENTIAL GROWTH RATES FOR FREE GROUPS

Malik Koubi

Abstract

Let F_p be a free group of rank $p \geq 2$. It is well-known that, with respect to a p-element generating set, that is, a basis, the exponential growth rate of F_p is $2p-1$. We show that the exponential growth rate τ of a group G with respect to a p-element generating set X is $2p-1$ if and only if G is free on X; otherwise $\tau < 2p-1$. We also prove that, for any finite generating set X of F_p which is disjoint from X^{-1}, the exponential growth rate τ of F_p with respect to X is $2p-1$ if and only if X is a basis of F_p; otherwise $\tau > 2p-1$.

Keywords. Free group, exponential growth rate.
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