

Right Orders on Free Groups and the Word Problem for Free Lattice-Ordered Groups

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Abstract

Given the class of all lattice-ordered groups, consider the problem of deciding whether an equation belongs to its equational theory. This can be equivalently formulated as the word problem for free lattice-ordered groups. We demonstrate the equivalence of the latter to the problem of deciding whether a finitely generated partial right order on a free group extends to a total right order. A useful consequence of establishing this equivalence is that algorithms used to decide one problem can be used also to decide the other.