

Generation and decidability for the variety of distributive ℓ -pregroups

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Lattice-ordered pregroups (ℓ -pregroups) are a natural generalization of lattice-ordered groups (ℓ -groups). While Cayley-Holland's embedding theorem establishes that every ℓ -group can be embedded into a symmetric one, a similar theorem exists for distributive ℓ -pregroups. This theorem states that any distributive ℓ -pregroup can be embedded into a functional one. Our work extends this result by showing that any distributive ℓ -pregroup can be embedded into a functional one over a chain that is locally isomorphic to $\mathbb{Z}$. Building upon this finding, we prove that the variety of distributive ℓ -pregroups is generated by the (single) functional algebra over the integers. This result will subsequently be used to demonstrate the decidability of the variety.

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