

Small left distributive quasigroups

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In this work we study finite left distributive (LD) quasigroups. The quasigroup can be represented on cosets of its left multiplication group. We use this representation to convert the questions about the quasigroup into group theoretical questions. In Chapter 1, we compile the content of two papers by V. M. Galkin, expand the proofs and supplement it with remarks.

In Chapter 2, we apply this theory to classify all the LD quasigroups of orders up to 15. Medial idempotent quasigroups (a simpler special case) of these orders are listed, using Toyoda's theorem. For a general LD quasigroup, we investigate its possible simplicity. Afterwards, we sketch a general procedure how to use a normal subquasigroup to apprehend the quasigroup structure. This procedure is elaborated under additional conditions on the LD quasigroup. These conditions are shown to hold for LD quasigroups on 9, 12 and 15 elements (the only possible non-medial cases of order no more than 15) and this leads to the final conclusions. In chapter 3, the only two non-medial LD quasigroups of order 15 are explicitly constructed.

Chapters 2 and 3 contain mostly author's original work. The author intends to use the work as his Bachelor's thesis.