Brožíková, Elena

On 3-basic quasigroups and their congruences. (English) Zbl 0701.20044

Čas. Pěstování Mat. 115, No. 1, 38-47 (1990).

The quadruple $(Q_1, Q_2, Q_3; A)$, where Q_1, Q_2, Q_3 are non-void sets with the same cardinality and A is a map of $Q_1 \times Q_2$ onto Q_3 is called a 3-basic quasigroup if in the equation $A(a_1, a_2) = a_3$ any two of the elements $a_1 \in Q_1$, $a_2 \in Q_2$, $a_3 \in Q_3$, uniquely determine the remaining one. The set of all autotopies of a given 3-basic quasigroup forms a group, it is called the full autotopy group. A subgroup G of the full autotopy group of a given 3-basic quasigroup Q is said to be special if its component groups Γ_1, Γ_2, Γ_3 from a 3-basic quasigroup $(\Gamma_1, \Gamma_2, \Gamma_3; *)$, where $\alpha * \beta = \gamma \Leftrightarrow (\alpha,\beta,\gamma) \in G$ for $\alpha \in \Gamma_1$, $\beta \in \Gamma_2$, $\gamma \in \Gamma_3$. In this paper a one-to-one correspondence between special subgroups G and normal congruences of a given 3-basic quasigroup Q is proved. In the end of the paper the author shows that all results can be generalized to (n+1)-basic quasigroups.

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MSC:

20N05 Loops, quasigroups
20N15 n-ary systems ($n \geq 3$)

Keywords:

3-basic quasigroup; full autotopy group; special subgroups; normal congruences; $(n+1)$-basic quasigroups