here $(a,q)_n = (1-a)(1-a\,q)\cdots(1-a\,q^{n-1})$ is $q-$shifted factorial.

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Contact information

**Nadia Ilash**
Department of Programming, Computer and Telecommunication systems, Khmelnytskyi National University, Khmelnytskyi, Ukraine
Kamyanets-Podilsky College of Food Industry, National University of Food Technologies, Kamyanets-Podilsky, Ukraine
*Email address*: nadyailash@gmail.com


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# Some examples of even quandles and their automorphism groups

Abednego O. Isere

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Quandles are non-associative algebraic structures that are idempotent and distributive. The concept of quandles is still relatively new. Hence, this work is aimed at developping a new method of constructing quandles of finite even orders. Inner automorphism groups of the examples were obtained. The centralizer of certain elements of the quandles constructed were also obtained, and these were used to classify the constructed examples up to isomorphism.


Contact information

**Abednego O. Isere**
Department of Mathematics, Ambrose Alli University, Ekpoma, 310001, Nigeria
*Email address*: abednis@yahoo.co.uk, isereao@aauekpoma.edu.ng


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# On semicommutative semigroups and abelian polygons

Yuriy Ishchuk

We introduce the notions of semicommutative semigroups and abelian $S$-polygons by analogy with the notions of semicommutative, abelian modules and rings investigated in [**1**] and [**2**].

Definition 1. We say a semigroup $S$ is a semicommutative semigroup if for any $x, y \in S$, $xy = 0$ implies $xSy = 0$.

Proposition 1. *For a semigroup $S$ the following three statement are equivalent:*

(i) *Any right annihilator over $S$ is an ideal of $S$.*
(ii) *Any left annihilator over $S$ is an ideal of $S$.*
(iii) *A semigroup $S$ is semicommutative.*

Definition 2. We say a semigroup $S$ is a reduced if $s^2 = 0$ implies $s = 0$ for any $s \in S$.

Definition 3. We call a semigroup $S$ to be reversible if $st = 0$ implies $ts = 0$ for any $s, t \in S$.

Proposition 2. *The following implications hold for semigroup $S$:*
*$S$ — reduced $\Rightarrow$ $S$ — reversible $\Rightarrow$ $S$ — semicommutative.*

In general, each of these implications is irreversible (see [**4**]).

Easy to prove that every reduced semigroup is a semicommutative. In [**3**] D. Anderson and V. Camillo proved that if $S$ is a reduced semigroup, then $S$ satisfies $ZC_n$, for all $n \geq 2$. (A semigroup $S$ satisfies condition $ZC_n$, if for any $a_1, \ldots, a_n \in S$ $a_1 \cdots a_n = 0$ implies $a_{\sigma(1)} \cdots a_{\sigma(n)} = 0$ for all $\sigma \in S_n$.) We prove the following

Proposition 3. *If $S$ is Clifford semigroup (i.e. inverse semigroup with central idempotents) and satisfies $ZC_n$ for some $n \geq 2$, then $S$ is a reduced semigroup.*

Definition 4. We say a (right) $S$-polygon $A_S$ is abelian if, for any $a \in A_S$ and any $s \in S$, any idempotent $e \in S$, $ase = aes$.

Proposition 4. *The class of abelian $S$-polygons is closed under subpolygons, direct products and homomorphic images.*

Proposition 5. *If the $S$-polygons $A_S$ is semicommutative, then $A_S$ is abelian.*

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Contact information

**Yuriy Ishchuk**
Faculty of Mechanics and Mathematics, Ivan Franko National University of Lviv, Lviv, Ukraine
*Email address*: yuriy.ishchuk@lnu.edu.ua

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# Basarab Loop and the Generators of its Total Multiplication Group

Tèmítọ́pẹ́ Gbọ́láhàn Jaíyéọlá , Gideon Okon Effiong

A loop $(Q, \cdot)$ is called a Basarab loop if the identities: $(x \cdot yx^\rho)(xz) = x \cdot yz$ and $(yx) \cdot (x^\lambda z \cdot x) = yz \cdot x$ hold. It was shown that the left, right and middle nuclei of the Basarab loop coincide, and the nucleus of a Basarab loop is the set of elements $x$ whose middle inner mapping $T_x$ are automorphisms. The generators of the inner mapping group of a Basarab loop were refined in terms of one of the generators of the total inner mapping group of a Basarab loop. Necessary