

عنوان مقاله:

Remarks on the sum of element orders of non-group semigroups

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خلاصه مقاله:

The invariant $\psi(G)$, the sum of element orders of a finite group G will be generalized and defined for the finite non-group semigroups in this paper. We give an appropriate definition for the order of elements of a semigroup. As well as in the groups we denote the sum of element orders of a non-group semigroup S , which may possess the zero element and/ or the identity element, by $\psi(S)$. The non-group monogenic semigroup will be denoted by $C_{\{n,r\}}$ where $1 \leq r \leq n$. In characterizing the semigroups $C_{\{n,r\}}$ we give a suitable upper bound and a lower bound for $\psi(C_{\{n,r\}})$, and then investigate the sum of element orders of the semi-direct product and the wreath product of two semigroups of this type. A natural question concerning this invariant may be posed as "For a finite non-group semigroup S and the group G with the same presentation as the semigroup, is $\psi(S)$ equal to $\psi(G)$ approximately?" We answer this question in part by giving classes of non-group semigroups, involving an odd prime p and satisfying $\lim_{p \rightarrow \infty} \frac{\psi(S)}{\psi(G)} = 1$. As a result of this study, we attain the sum of element orders of a wide class of cyclic groups, as well

کلمات کلیدی:

Sum of element orders, Finite group, Non-group semigroups

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