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B-ALGEBRAS ACTING ON SETS

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Abstract. In this paper, we introduce the notion of a B-action of a B-algebra X on a set S. We show that a B-action $*'$ of X on S induces an equivalence relation on S defined by $s \sim s'$ if and only if $x *' s = s'$ for some $x \in X$. Moreover, for any $s \in S$, the cardinality of the equivalence class $[s]_B$ of s is equal to the index of the corresponding subalgebra X_s in X, that is, $|[s]_B| = [X : X_s]_B$, where $X_s = \{x \in X : x *' s = s\}$. Furthermore, the number of distinct equivalence classes is given by $\frac{1}{|X|}\sum_{x\in X} F(x)$, where $F(x)$ is the number of elements of S fixed by x. We also introduce B-faithfulness and B-transitivity and investigate some related properties.

Key words and phrases. B-algebras, B-action, B-orbits, B-faithful, B-transitive.