

CONJUGACY CLASSES OF LEFT IDEALS OF A FINITE DIMENSIONAL ALGEBRA

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Abstract: Let A be a finite dimensional unital algebra over a field K and let $C(A)$ denote the set of conjugacy classes of left ideals in A . It is shown that $C(A)$ is finite if and only if the number of conjugacy classes of nilpotent left ideals in A is finite. The set $C(A)$ can be considered as a semigroup under the natural operation induced from the multiplication in A . If K is algebraically closed, the square of the radical of A is zero and $C(A)$ is finite, then for every K -algebra B such that $C(B) \cong C(A)$ it is shown that $B \cong A$.

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Key words: Finite dimensional algebra, left ideal, semigroup, conjugacy class.