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Clifford Elements in Lie Algebras

Let L be a Lie algebra over a field \mathbb{F} of characteristic zero or $p > 3$. An element $c \in L$ is called *Clifford* if $\text{ad}_c^3 = 0$ and its associated Jordan algebra L_c is the Jordan algebra $\mathbb{F} \oplus X$ defined by a symmetric bilinear form on a vector space X over \mathbb{F} . In this paper we prove the following result: Let R be a centrally closed prime ring R of characteristic zero or $p > 3$ with involution $*$ and let $c \in \text{Skew}(R, *)$ be such that $c^3 = 0$, $c^2 \neq 0$ and $c^2kc = ckc^2$ for all $k \in \text{Skew}(R, *)$. Then c is a Clifford element of the Lie algebra $\text{Skew}(R, *)$.

Keywords: Lie algebra, ring with involution, Jordan algebra, inner ideal, Jordan element.

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