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Title: Maps from $M_n()$ to that are multiplicative with respect to the Jordan triple product

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Let $\mathbb{F}$ be the field of complex numbers $\mathbb{C}$ or the field of real numbers $\mathbb{R}$. Denote by $M_n(\mathbb{F})$ the set of all $n \times n$ matrices over the field $\mathbb{F}$. We show that if Φ is a map from $M_n(\mathbb{F})$ to $\mathbb{F}$ that is multiplicative with respect to Jordan triple product, that is, a map: $\Phi : M_n(\mathbb{F}) \to \mathbb{F}$ satisfying

$$\Phi(ABA) = \Phi(A)\Phi(B)\Phi(A), \quad A, B \in M_n(\mathbb{F})$$

then there exists a multiplicative function $\varphi : \mathbb{F} \to \mathbb{F}$ such that either $\Phi(A) = \varphi(\det A)$ for all $A \in M_n(\mathbb{F})$ or $\Phi(A) = -\varphi(\det A)$ for all $A \in M_n(\mathbb{F})$.

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