

Year: 2022

Vol.: 100

Fasc.: 3-4

Title: On a functional equation related to generalized inner derivations

Author(s): Irena Kosi-Ulbl and Joso Vukman

The purpose of this paper is to prove the following result. Let X be a real or complex Banach space, let $\mathcal{L}(X)$ be the algebra of all bounded linear operators on X , and let $\mathcal{A}(X) \subseteq \mathcal{L}(X)$ be a standard operator algebra, which possesses the identity operator. Suppose there exists a linear mapping $F : \mathcal{A}(X) \rightarrow \mathcal{L}(X)$ satisfying the relation $F(A^n) = F(A^{n-1})A - AF(A^{n-2})A + AF(A^{n-1})$ for all $A \in \mathcal{A}(X)$ and some fixed integer $n \geq 3$. In this case, F is of the form $F(A) = AB_1 + B_2A$ for all $A \in \mathcal{A}(X)$ and some fixed $B_1, B_2 \in \mathcal{L}(X)$. In particular, F is continuous.

Address:

Irena Kosi-Ulbl
Faculty of Mechanical Engineering
University of Maribor
Smetanova 17
2000 Maribor
Slovenia

Address:

Joso Vukman
Department of Mathematics
and Computer Science
Faculty of Natural Sciences
and Mathematics
University of Maribor
Koroška 160
2000 Maribor
Slovenia