On an Albert's Problem in Nonassociative Algebra*

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Abstract

The following is an open problem, known in nonassociative algebra as *Albert's Problem:*

Is every finite-dimensional commutative power-associative nilalgebra solvable?.

Let B be any nonassociative algebra. We define inductively the following powers of B: $B^1 = B, \dots, B^n = B^{n-1}B + B^{n-2}B^2 + \dots + BB^{n-1}$; $B^{(0)} = B, \dots, B^{(n)} = \left(B^{(n-1)}\right)^2$. We say that B is *nilpotent* (respectively, *solvable*) when $B^k = 0$ (respectively, $B^{(k)} = 0$) for some k. It is clear that nilpotent implies solvable. The algebra B is *power-associative* in case the subalgebra generated by any element of B is associative. When B is power-associative, the powers of $x \in B$ are well-defined by $x^1 = x, \dots, x^n = x^{n-1}x$, and we say that B is a *nilalgebra* if there exists a k such that $x^k = 0$ for all $x \in B$.

In our talk we will show some advances and present situation of the Albert's problem.

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