

# **Primitive elements (coordinate polynomials) and almost primitive elements of free algebras**

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A variety of linear algebras over a field is said to be Schreier if any subalgebra of a free algebra of this variety is free. The variety of all algebras, the variety of all commutative algebras, the variety of all anti-commutative algebras, the variety of all Lie algebras, the variety of all Lie superalgebras, varieties of all Lie  $p$ -algebras and Lie  $p$ -superalgebras are the main types of Schreier varieties of algebras.

Let  $A(X)$  be the free algebra of a Schreier variety of algebras with the set  $X$  of free generators. A system of elements  $u_1, \dots, u_n$  of  $A(X)$  is primitive if there is a set  $Y$  of free generators of the free algebra  $A(X)$  such that  $u_1, \dots, u_n$  belong to  $Y$ .

An element  $u$  of  $A(X)$  is said to be almost primitive if  $u$  is not a primitive element of  $A(X)$ , but  $u$  is a primitive element of any subalgebra of  $A(X)$  which contains it.

Algorithms to recognize primitive systems of elements of free algebras of the main types of Schreier varieties of algebras are constructed. We obtain also algorithms to construct complements of primitive systems of elements with respect to free generating sets. Series of almost primitive elements are constructed.