

Hook theorem, its consequences and generalizations.

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Hook theorem is one of the key result of the classical theory of polynomial identities of algebras in the case of a field of characteristic zero. This well known result is fundamental for applications of the technique of the classic representation theory of the symmetric group to study identities. It has essential connections with many important facts of PI-theory, and implies many important and interesting consequences. In particular, it is one of the basic results for Kemer's positive solution of the Specht problem. Also it is the base to construct the growth theory for varieties of associative algebras over a field of characteristic zero.

In the last years, one of the most popular directions of the theory of polynomial identities is to consider algebras with some additional structures (such as gradings, involutions, actions by automorphisms, etc.), and to study identities of such algebras with the additional signature.

We will discuss the generalised versions of the hook theorem for various types of such identities with complementary structures. In particular, we will represent some version of the hook theorem for identities with some types of actions. This result generalizes the analogous results known before, for example, for graded identities or identities with involution. We also will discuss some possible consequences and applications of this theorem.

The talk is based on a joint work with Renata Alves da Silva.