INSALATE DI MATEMATICA

presents

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Algebras, identities and other drugs

Abstract: An identity is a symbolic expression involving operations and variables which is always satisfied when the variables are replaced in a given algebraic structure. I will start with a motivating example leading into the basic notions of the theory of polynomial identities in algebras. Then I will present the celebrated theorem of Amitsur and Levitzk (1950) stating that a certain standard polynomial is an identity for the algebra of square matrices. This initial combinatorial method proved to be limited until Regev introduced in 1972 a growth function measuring the size of identities. This new analytic approach, combined with techniques from ring theory, combinatorics and representation theory of groups, forms one of the current points of view of the theory. Along the way I shall try to give an idea of the recent developments of the theory when one considers associative algebras endowed with some additional structure.

Keywords: Algebras · identities · growth

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"Obvious" is the most dangerous word in mathematics.
(Eric Temple Bell)