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PROBLEMS OF CLASSIFYING ASSOCIATIVE OR LIE ALGEBRAS OVER A FIELD OF CHARACTERISTIC NOT TWO AND FINITE METABELIAN GROUPS ARE WILD*

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Abstract. Let $\mathbb{F}$ be a field of characteristic different from 2. It is shown that the problems of classifying

(i) local commutative associative algebras over $\mathbb{F}$ with zero cube radical,
(ii) Lie algebras over $\mathbb{F}$ with central commutator subalgebra of dimension 3, and
(iii) finite p-groups of exponent p with central commutator subgroup of order p^3

are hopeless since each of them contains

- the problem of classifying symmetric bilinear mappings $U \times U \to V$, or
- the problem of classifying skew-symmetric bilinear mappings $U \times U \to V$,

in which U and V are vector spaces over $\mathbb{F}$ (consisting of p elements for p-groups (iii)) and V is 3-dimensional. The latter two problems are hopeless since they are wild; i.e., each of them contains the problem of classifying pairs of matrices over $\mathbb{F}$ up to similarity.

Key words. Wild problems, Classification, Associative algebras, Lie algebras, Metabelian groups.

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