

On the classification of Lie algebras with non-trivial Levi factor.

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Abstract: *The classification of Lie algebras is a classical problem that is partially solved. In particular, Levi's theorem divides this problem into the classification of semi-simple Lie algebras, solvable Lie algebras and representation theory of semi-simple Lie algebras. There are also some results that divide the classification of solvable Lie algebras into that of nilpotent Lie algebras and some other invariants. The work that will be presented is the result of making use of the representation theory of semi-simple Lie algebras in order to compute the structure of the nilradical of an algebra $L = \mathfrak{S} \oplus \text{Rad}(L)$. A method will be shown to classify Lie algebras whose radical is nilpotent; although time inefficient. Finally, it would be applied to solve two specific classification problems step by step.*