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CLASS, DIMENSION AND LENGTH IN NILPOTENT LIE ALGEBRAS*

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Abstract. The problem of finding the smallest order of a p-group of a given derived length has a long history. Nilpotent Lie algebra versions of this and related problems are considered. Thus, the smallest order of a p-group is replaced by the smallest dimension of a nilpotent Lie algebra. For each length t, an upper bound for this smallest dimension is found. Also, it is shown that for each $t \geq 5$ there is a two generated Lie algebra of nilpotent class $d = 21(2^{t-5})$ whose derived length is t. For two generated Lie algebras, this result is best possible. Results for small t are also found. The results are obtained by constructing Lie algebras of strictly upper triangular matrices.

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