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Citations | From References: 5 | From Reviews: 3

MR0032613 (11,317d) 09.1X
Iwasawa, Kenkichi
On the representation of Lie algebras.
Jap. J. Math. **19,** (1948). 405–426

Let L be a Lie algebra, and let N be an Abelian ideal in L. Then N is said to split L if L is the direct sum of N and of a subalgebra L_1 of L. The author first proves that it is always possible to find a Lie algebra L_0 and an Abelian ideal N_0 in L_0 with the following properties: L_0 contains L, $N_0 \cap L = N$, $L_0 = N_0 + L$, N_0 splits L_0; L_0 is then called a splitting algebra of L (relatively to N). To begin with, a splitting algebra is constructed in the most general case which, however, is always infinite dimensional (except if $N = L$). The author then proceeds to extract (in the case where L is finite dimensional) a finite dimensional splitting algebra from the infinite dimensional one. In order to do this, he treats separately the cases where the basic field is of characteristic 0 or not 0. In the first case, he considers successively the cases where L is nilpotent, solvable or general; for the first two cases, he makes extensive use of a process analogous to the "straightening process" of G. Birkhoff [Ann. of Math. (2) **38,** 526–532 (1937)]. In the case of characteristic p, L is first imbedded in a restricted Lie algebra in the sense of Jacobson [Trans. Amer. Math. Soc. **42,** 206–224 (1937)]. Once the existence of a finite dimensional splitting for a (finite dimensional) Lie algebra L with respect to its center is established, it is not difficult to derive a proof of Ado's theorem, to the effect that L admits a faithful linear representation. *C. Chevalley*

{For errata to the bibliographic data of the original MR item see MR 11,872 Errata and Addenda in the paper version.}

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