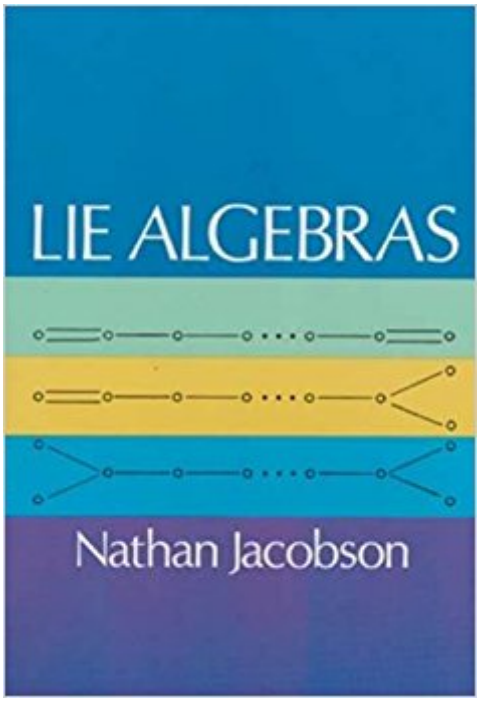
Lie Algebras (Dover Books On Mathematics)



Synopsis

Lie group theory, developed by M. Sophus Lie in the nineteenth century, ranks among the more important developments in modern mathematics. Lie algebras comprise a significant part of Lie group theory and are being actively studied today. This book, by Professor Nathan Jacobson of Yale, is the definitive treatment of the subject and can be used as a text for graduate courses.Chapter 1 introduces basic concepts that are necessary for an understanding of structure theory, while the following three chapters present the theory itself: solvable and nilpotent Lie algebras, CartanÃ¢â ¬â„¢s criterion and its consequences, and split semi-simple Lie algebras. Chapter 5, on universal enveloping algebras, provides the abstract concepts underlying representation theory. The basic results on representation theory are given in three succeeding chapters: the theorem of Ado-Iwasawa, classification of irreducible modules, and characters of the irreducible modules. In Chapter 9 the automorphisms of semi-simple Lie algebras over an algebraically closed field of characteristic zero are determined. These results are applied in Chapter 10 to the problems of sorting out the simple Lie algebras over an arbitrary field. The reader, to fully benefit from this tenth chapter, should have some knowledge about the notions of Galois theory and some of the results of the Wedderburn structure theory of associative algebras.Nathan Jacobson, presently Henry Ford II Professor of Mathematics at Yale University, is a well-known authority in the field of abstract algebra. His book, Lie Algebras, is a classic handbook both for researchers and students. Though it presupposes knowledge of linear algebra, it is not overly theoretical and can be readily used for self-study.

Book Information

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Customer Reviews

One of the world's leading researchers in abstract algebra, Nathan Jacobson (1910-95) taught at several prominent universities, including the University of Chicago, Johns Hopkins, and Yale.

If you'd like to read a leisurely introduction to Lie Algebras, this is not the text for you. It's not that the content is particularly difficult, it's just that Jacobson's notation (operators acting on the right, fraktur letters, etc.) combined with an antiquated approach to mathematical prose and also a lack of LaTeX formatting lead this otherwise nice book to be much more difficult to parse than intended. Jacobson's other texts, such as Basic Algebra 1 and 2, are by comparison much easier to read and understand. He offers many exercises which range from trivial to short (but not necessarily easy) proofs and also longer (much longer) computations. In particular, finding a base for the root system E7, which involves pages and pages and pages of notes.I wouldn't recommend this book to anyone, really. I find math texts from before the 80s or so are often a lot more difficult to read than they feel like they should be.

Lie groups and Lie algebras have become essential to many parts of mathematics and theoretical physics, with Lie algebras a central object of interest in their own right. This book is a very well thought out and well-written introduction to Lie algebras and it provides an excellent entry point into Lie theory for advanced undergraduates and early graduate students interested in learning about the subject.

I am a research mathematician and writing a research monograph in differential geometry. I found this an excellent reference for filing in the details from Wikipedia. It is a classic in the subject that somehow I had not managed to pick up in my career and it was nice to find an inexpensive copy of this to put on my shelf.

good

This book is a classic book in Lie theory and can be used to be a basic materials for Lie algebria and further infinite Lie algebria. It is also a nice textbook.

Good book

It''s a classic!

I recently noticed that my early edition of this book could not be found, so, I ordered another copy. It is just as good as my recollections some fourty and more years later told me. There is really no more to be said, despite more recent work, and the discoveries by physicists between 1965 and 1995. I think we all hope that Lie Algebras will be just as useful in interpretation of results soon to be forthcoming from the European Super Collider, and we hope from an even bigger paticle accelerator built somewhere in the United States.

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