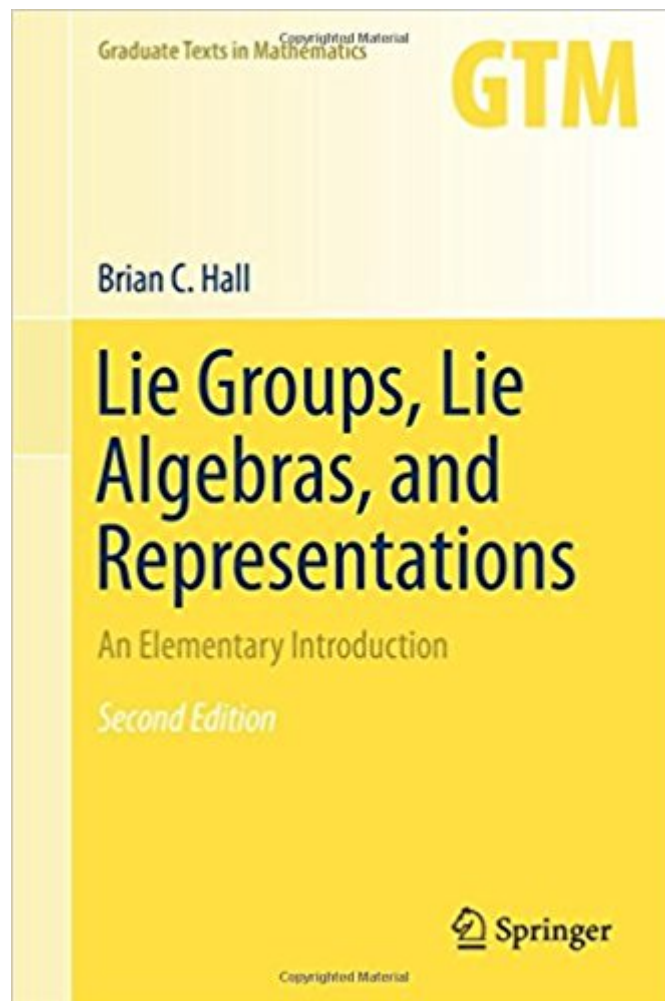# Lie Groups, Lie Algebras, And Representations: An Elementary Introduction (Graduate Texts In Mathematics)

# Synopsis

This textbook treats Lie groups, Lie algebras and their representations in an elementary but fully rigorous fashion requiring minimal prerequisites. In particular, the theory of matrix Lie groups and their Lie algebras is developed using only linear algebra, and more motivation and intuition for proofs is provided than in most classic texts on the subject.In addition to its accessible treatment of the basic theory of Lie groups and Lie algebras, the book is also noteworthy for including:a treatment of the Bakerâ "Campbellâ "Hausdorff formula and its use in place of the Frobenius theorem to establish deeper results about the relationship between Lie groups and Lie algebrasmotivation for the machinery of roots, weights and the Weyl group via a concrete and detailed exposition of the representation theory of sl(3;C)an unconventional definition of semisimplicity that allows for a rapid development of the structure theory of semisimple Lie algebrasa self-contained construction of the representations of compact groups, independent of Lie-algebraic argumentsThe second edition of Lie Groups, Lie Algebras, and Representations contains many substantial improvements and additions, among them: an entirely new part devoted to the structure and representation theory of compact Lie groups; a complete derivation of the main properties of root systems; the construction of finite-dimensional representations of semisimple Lie algebras has been elaborated; a treatment of universal enveloping algebras, including a proof of the Poincaréâ "Birkhoffâ "Witt theorem and the existence of Verma modules; complete proofs of the Weyl character formula, the Weyl dimension formula and the Kostant multiplicity formula.Review of the first edition:This is an excellent book. It deserves to, and undoubtedly will, become the standard text for early graduate courses in Lie group theory ... an important addition to the textbook literature ... it is highly recommended.â • The Mathematical Gazette

# Book Information

Best Sellers Rank: #142,462 in Books (See Top 100 in Books)  #15 in Books > Science & Math > Mathematics > Pure Mathematics > Group Theory  #19 in Books > Science & Math > Mathematics > Geometry & Topology > Topology  #19 in Books > Science & Math > Mathematics > Pure Mathematics > Algebra > Abstract

## Customer Reviews

I am a 'hobby mathematician only.The book was my first real exposure to this subject. The books seems to cover the subject well. I feel, most proofs can be understood with a good undergratuate education in math. Also the motivation, why one should do this, is well spelled out.Only matrix Lie groups are covered, but I cannot judge whether this is any draw back - as it was my first exposure to it.I found a number of typos ( quite a few for a second edition...), but the author has a list of errors on his website. I might make sense to download this list before one starts to read the book - I only did it after I was done.

Great book and excellent service!

fantastic

Lie Groups, Lie Algebras, and Representations: An Elementary Introduction (Graduate Texts in Mathematics) Lie Groups, Lie Algebras, and Representations: An Elementary Introduction Representations of Compact Lie Groups (Graduate Texts in Mathematics) Applications of Lie Groups to Differential Equations (Graduate Texts in Mathematics) Groups and Symmetries: From Finite Groups to Lie Groups (Universitext) The Symmetric Group: Representations, Combinatorial Algorithms, and Symmetric Functions (Graduate Texts in Mathematics, Vol. 203) Lie Groups: An Approach through Invariants and Representations (Universitext) Quantum Groups (Graduate Texts in Mathematics) Groups, Graphs and Trees: An Introduction to the Geometry of Infinite Groups (London Mathematical Society Student Texts) Geometries, Groups and Algebras in the Nineteenth Century - A History Representations of Algebraic Groups (Mathematical Surveys and Monographs) Lie Algebras In Particle Physics: from Isospin To Unified Theories (Frontiers in Physics) Lie Algebras in Particle Physics: From Isospin to Unified Theories (Frontiers in Physics, Vol. 54) Discrete Mathematics: Elementary and Beyond (Undergraduate Texts in Mathematics) Differential Geometry, Lie Groups, and Symmetric Spaces, Volume 80 (Pure and Applied Mathematics) Classical Groups and Geometric Algebra (Graduate Studies in Mathematics) Introduction to Smooth

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