However, here the classical Lie algebras are defined axiomatically and then classified - a procedure which is far more than a rehash of the characteristic zero classification.

The groups of automorphisms of the classical Lie algebras are intimately connected with the Chevalley groups which in turn have given an enormous impetus to the theory of simple groups. The Chevalley group G of a classical Lie algebra L is defined and the theory developed far enough to establish the Bruhat decomposition, the simplicity theorem for G', and Steinberg's result that Aut (L) is a semi-direct product of G and the group of graph automorphisms of L. Chapter 3 concludes with the identification of the Chevally groups with the classical groups of geometric algebra.

Chapter 4 deals with forms of the classical Lie algebras. The fundamental problem might be described as that of classifying the isomorphism classes of Lie algebras L over a field F such that L_K is classical for some finite extension field K over F. For the types A - D this ultimately depends on simple associative algebras with involutions. The known results on the forms of algebras of exceptional type involve derivations of Cayley and Jordan algebras and are only outlined.

Chapters 5 and 6 are considerably more sketchy though there are numerous references to the literature. Chapter 5 is devoted to a comparison of the modular and non-modular cases. There is also a description of the known simple modular Lie algebras. In Chapter 6 the author briefly describes the part that modular Lie algebras play in other areas of mathematics, notably in Burnside's problem and in the theories of algebraic and formal groups.

There is a complete bibliography.

The vast amount of material covered in the 160 pages of this book has, no doubt, necessitated a condensed style which makes for relatively hard reading in places. This does not apply however to Chapters 2 and 3 which will form an excellent introduction to the classical Lie algebras and the Chevalley groups for anyone familiar with the theory of the split semi-simple Lie algebras. There can be no doubt that this book is an extremely valuable addition to the mathematical literature.

Robert V. Moody, New Mexico State University

Lectures on Boolean algebras, by P.R. Halmos. Van Nostrand. iv + 147 pages. $2.95.

The author treats Boolean algebras both as algebraic systems and, via the duality theory, as the families of clopen sets of Boolean spaces (completely disconnected, compact Hausdorff spaces). Subalgebras, ideals, homomorphisms, free algebras, products and sums of algebras and

https://doi.org/10.1017/S0008439500029453 Published online by Cambridge University Press

projective and injective algebras are all discussed. Also included are sections on Boolean algebras with infinitary operations (σ-algebras and complete algebras). Most of these algebraic concepts are dualized. The author includes many examples which amply motivate the study.

This little book is readable, informative and reasonably priced. For more than half of it, the reader requires only the rudiments of algebra and set theory, but familiarity with point set topology is essential. For the remainder some measure theory and a bit more algebra are useful. There is a good selection of exercises and an index. Unfortunately, there is no bibliography.

W.D. Burgess, McGill University

Introduction to finite mathematics, by J.G. Kemeny, J.L. Snell, G.L. Thompson. Prentice-Hall Inc., Englewood Cliffs, N.J., Second edition, 1966. xiv + 465 pages. $8.95.

This book is designed to expose students outside of the exact sciences to types of mathematics for which such students may find applications more immediate than they might for the traditional calculus and analytic geometry sequence. Any mathematician who has had occasion to consult books and journals in the behavioral sciences will agree that there is much work to be done in this direction. Indeed, this is the only reservation this reviewer has towards this very readable, yet mathematically rigorous text: that it may be opening up to the non-scientist new areas of mathematics for abuse. But for every charlatan who may now have a few more mathematical terms to play with, there will be hundreds of honest practitioners of their various professions who may now regard mathematics as something other than a required but useless college course; the extension of literacy has always produced a few who might better have been left illiterate.

The subject matter is as follows: Chapter I - mathematical logic; applications to switching circuits; Chapter II - finite set theory; applications to voting coalitions; Chapter III - combinatorial analysis; further applications to voting problems; Chapter IV - probability theory, including finite stochastic processes; Chapter V - matrix theory; applications to Markov chains; permutation groups; Chapter VI - linear programming and game theory; Chapter VII - applications to sociometry, genetics, psychology, econometrics, computer simulation.

The book assumes in the reader "the mathematical maturity obtained from two and one-half or more years of high school mathematics". It is only because of the consequent lack of sophistication that it might not be suitable for classroom use with better prepared students; but it could well be used by the latter as a collateral text, and read without the assistance of an instructor. How many honours mathematics students in Canada are exposed to all of the topics discussed in this book?