The book is not without its flaws. The Hermite polynomials defined are different from the customary ones. The term spectral decomposition is used without apparent definition. There is no motivation for the inclusion of the last two chapters; the extensive development of the properties of Bessel functions does not mention that they are important in problems in cylindrical coordinates. I would also have liked to see references for the omitted proofs of the deeper theorems.

J.D. Talman, University of Western Ontario

Algebraic structure theory of sequential machines, by J. Hartmanis and R.E. Stearns. Prentice-Hall, Inc., Englewood Cliffs, N.J., 1966. viii + 211 pages. $11.50.

A recent and exciting new area of applied mathematics is the study of abstract models of digital computers. The authors, who have played a major role in this field, present here a unified and up-to-date account of a theory which has had a remarkably complete development between the years 1960 and 1965. The mathematical core of the book is the chapter on pair algebras (closely related to Galois connections between partially ordered sets); this theory is then applied to loop-free structures, state splitting, and feedback. The final chapter is an application of semigroup theory to capability problems about loop-free realizations. The book is strongly recommended not only to the worker in machine theory, but to anyone interested in examining a new and highly significant area of applied mathematics.

H. Kaufman, McGill University

An introduction to the foundations and fundamental concepts of mathematics, by H. Eves and C.V. Newsom. Holt, Rinehart and Winston, revised edition, 1965. xi + 398 pages. $9.95.

This book is unusual in its content, and it is unusually well written. The topics are well chosen and, although very few are carried beyond a very early introductory stage, this is done in such a way that the urge to read further works must be nearly irresistible.

Interesting historical snippets occur on almost every page. Occasionally they are distracting, yet their cumulative effect, regardless of irrelevant details, is a strongly effective reminder that mathematics is a human activity. The book has in this regard some of the characteristics of a Fireside Book of Mathematics - it is good for browsing in small doses. Among its more solid historical merits is a remarkable 5-page condensed history of the transition from Greek mathematics to modern mathematics (distilled from another work by one of the authors). As an outline on which to base extended reading this would be hard to beat.

A treatment of the Poincaré model for Lobachevskian geometry is carried beyond the vaguely inspirational development so popular in "survey" books. The proof that AB = AC + CB, without which discussions of this topic have little value, is actually given, and the postulate concerning triangles with two sides and the contained angle equal is nicely handled by a sequence of exercises. Similarly the section on algebraic structures is carried beyond the usual inconsequential name-calling by an appendix on number fields and Euclidean constructions which is brief and readable, but substantial.

The sections on logic and axiomatics on the whole are good, but need a little more care in places. The use of the term "propositional function" for a propositional form could lead to misunderstanding. The term "formal axiomatics" describes what would better be described by "informal axiomatics" inasmuch as the axioms are considered to be "statements". Operations and relations are also included as "terms". The section which follows contains a sample axiom system and three interpretations of it, and is most effective. The independence of this set of axioms is neatly handled.

Both the postulational and the genetical approach to the real number system are introduced in an illuminating and well-motivated way. While many details are (mercifully) omitted, the larger issues are brought out very clearly. The problems in this chapter are especially good.

It is comforting to see at least one text in which the current "in" topic of Sets is postponed until chapter 8, and then is actually used to do something interesting. The authors (as so often happen) fail to observe that Cantor's proof that transcendentals exist can, with little difficulty, be made to point at a particular such number. The selection of topics in this chapter is particularly good.

In the reviewer's opinion, the concluding chapter on Logic and Philosophy is a far better introduction to this topic than is provided in most introductory books devoted entirely to it.

Perhaps the best feature of the book is an exceptionally interesting and well-chosen collection of problems. On the whole they are of moderate difficulty: what they may lack in challenge to ingenuity is more than made up for in significance and appropriateness.

An excellent and up-to-date bibliography is included, as well as a set of suggestions for the solution of some of the problems.

The book is eminently well suited to general mathematics students and those preparing for the teaching profession. It should be in every high school library as well.

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