

weighted data, and the precision of the estimate or estimates is examined. The modifications introduced into the several parameter problem by the existence of exact conditions between the parameters are described.

A final section deals with the calculation of the properties of univariate and bivariate frequency distributions and the inferences which can legitimately be made from the values obtained.

The whole book is presented in a lucid manner and the approach is at times quite stimulating. Although only a relatively elementary treatment of each topic is given, the appearance of all the material in a single, readable, volume makes this a useful book for workers in all branches of experimental science, provided they have a basic understanding of calculus and algebra including the binomial theorem.

J. R. GRAY

WARNER, SETH, *Modern Algebra* (Prentice-Hall, Inc., 1965), two volumes, 806 pp.

These books are designed for students who are inexperienced in modern algebra. Undoubtedly the reader who studies the volumes properly will gain valuable mathematical experience and an extensive knowledge of algebra. But if his task is not to be too protracted, there will be little time for anything else!

Many of the important notions of modern algebra are developed in the exercises at the end of each section. These are carefully arranged so that the reader's thoughts are guided along the right lines, but some of the problems are quite difficult. Thus a good supervisor seems to be essential for anyone inexperienced in the subject.

The overall plan of the two volumes is commendable. After the now standard introduction to set theory, the work is properly launched through the concept of a general binary operation. From there the reader is led to the specialised structures of semi-groups, groups, rings, fields, vector spaces and polynomial rings. Natural numbers are discussed in Volume I; the real and complex number fields are postponed until the first chapter of Volume II. Algebraic extensions, linear operators and inner product spaces are also discussed in Volume II and there is a final chapter on the axiom of choice; the latter might well have come earlier in the work.

In every case the topic under consideration is given a very full treatment. Thus Chapter V on vector spaces occupies 105 pages; Chapter IX on linear operators is nearly as long. The scope of many of the chapters is much wider than the titles suggest. That on vector spaces, for instance, introduces the reader to divisible groups and modules, structure theorems such as the Wedderburn-Artin theorem, and affine geometry. However, many such notions are met in the exercises and not in the text! Some parts of this chapter are fairly elementary. Thus matrices make their first appearance and a method for solving linear equations is explained. But other sections are much more sophisticated. Indeed the last section of the chapter seems a very difficult one for an inexperienced reader, who should be well pleased with his progress if he can do the exercises at the end.

Most of the chapters are developed on similar lines. Whilst the impressive amount of material has been carefully compiled, it is open to argument whether it is necessary to introduce so many details and so many terms. There seems to be a genuine danger that the reader will find these overwhelming. Moreover the notation is often too fussy, which helps to make the going difficult. Some of the definitions are not standard; for instance simple rings are assumed always to be artinian.

The printing and general production are extremely good and I found the detailed index very helpful. With reservations about the excessive amount of material, I would recommend these books as being worthy of a position in any mathematical library.

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