

Introduction to Algebraic Theories. By A. Adrian Albert. The University of Chicago Press, 1941. 8+137 pp. \$1.75.

Those who have learned abstract algebra know that its methods are at the same time simpler, easier to understand and more penetrating than the more classical procedures; but those who have taught abstract algebra know that there is one great obstacle in the way of the student desirous of acquainting himself with this new approach to algebra. The novice has first to learn to work with concepts, to "compute" with them as easily as he used to do with numbers and such like; though after having succeeded in this, he finds that everything else is comparatively easy going.

It is the object of this *Introduction to Algebraic Theories* to help the student in his attempt to overcome the difficulties just indicated and to acquire those habits of abstract thinking which are the indispensable foundation not only of abstract algebra, but of almost all present day mathematics. Since this book is intended to be a book of preparation, it does not require any previous knowledge—apart from algebraic techniques already known to the mathematicians of the Renaissance—though a willingness to work and think are indispensable.

The topics treated in this text are those which one would naturally expect: matrices, their equivalence and similarity, as well as a number of related subjects. This entails some study of polynomials—for technical reasons—and of linear spaces, since the latter are indispensable for understanding the real significance of the concepts pertaining to matrices. Indications of the technique of generalization—so important today—and of its usefulness are given throughout. The culmination of the whole work may be seen in the last chapter in which the fundamental concepts of abstract algebra are introduced as the natural outcome of the preceding considerations.

A great number of exercises—both numerical illustrations and mathematical applications—provide the reader with an opportunity to test the acquired skills. The book is written with the clarity of style, the arguments are presented with the elegance and precision which one has learned to expect from its author. Thus this text will prove valuable to student and teacher alike.

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