# A FIRST BOOK OF ALGEBRA

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A First Book of Algebra by John W. Hopkins & P. H. Underwood

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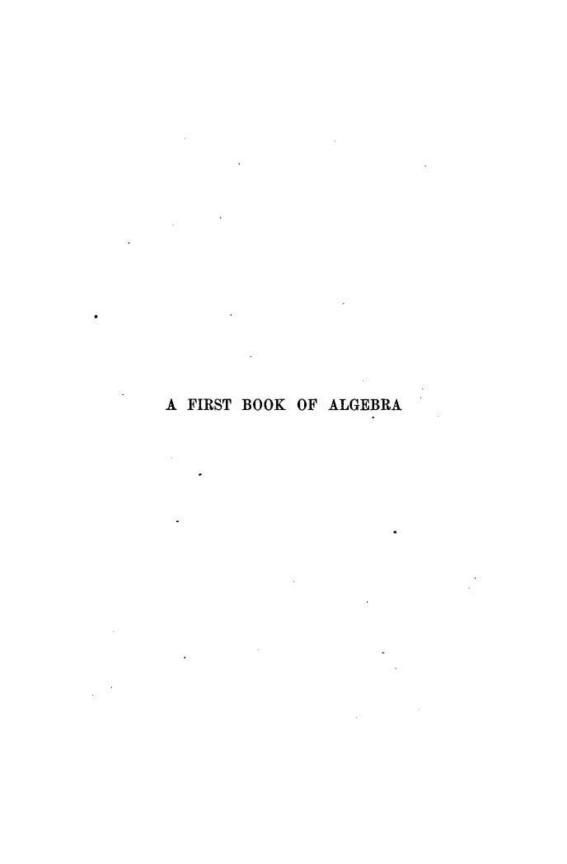
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# JOHN W. HOPKINS & P. H. UNDERWOOD

# A FIRST BOOK OF ALGEBRA





·The XXXX Co.

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# A FIRST BOOK OF ALGEBRA

## BY

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"As regards the method of teaching algebra, I would make it, in the earlier stages, as much a generalized arithmetic as possible. Results obtained by algebra would be verified by arithmetical instances; and the use of a formula would be indicated as including any number of instances. Elaborate (and to my mind wearisome) processes, useful for solving artificial combinations of difficulties, would be at least deferred. With a comparative beginner, progress towards new ideas or new stages of old ideas can, I think, best be made by the simplest instances, and it is on this account that I would build algebra entirely on arithmetical foundations so far as concerns the teaching of beginners."

- Professor Forsyth, M.A., D.Sc., F.R.S., Cambridge.

"It is assumed that pupils will be required throughout the course to solve numerous problems which involve putting questions into equations. Some of these problems should be chosen from mensuration, from physics, and from commercial life. The use of graphical methods and illustrations, particularly in connection with the solution of equations, is also expected."

> - Extract from the Report of the American Mathematical Society, 1903.

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### PREFACE

This book aims to introduce the young student to the study of algebra; in particular to those portions of algebra which are indispensable in the study of geometry, mensuration, physics, and chemistry as pursued in secondary schools. It is an outgrowth of class-room experience, lays stress on fundamental principles, and illustrates those principles so that the beginner may not "regard algebra as a very arbitrary affair, involving the application of a number of fanciful rules to the letters of the alphabet."

As far as the authors know, this is the first beginners' book that graphically illustrates the fundamental rules, fundamental laws and facts, and incidentally brings out in bold relief the essential connection between arithmetic, algebra, and concrete geometry. Whoever wishes to obtain a clear and sound knowledge of the fundamental operations of algebra must have recourse to arithmetic and geometric illustrations, for learning is at bottom largely a process of visualizing.

Every point which we have found to give trouble to the young learner is dealt with in a way to bring into play the perceptive powers of the student. Professor