Rudiments of Algebra

Fisher George Egbert

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Author: Fisher George Egbert

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RUDIMENTS OF ALGEBRA

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PREFACE.

THIS book gives a brief course in the elementary processes of algebra. Great care has been given to the representation, and to the solutions of typical exercises in the text, inculcating a thorough knowledge of algebraic processes.

Each principle or method is first clearly illustrated by numerous simple examples. But it is nowhere assumed that the principles are thereby proved. Even a beginner should not be encouraged, by text-book or teacher, to accept an illustrative example as a proof, or he will lose much of the educational value of the study.

Nearly all of the exercises have been prepared expressly for this book. They have been carefully graded, and, it is believed, none of them are too difficult for the average beginner.

The introductory chapter extends the familiar processes of arithmetic to the corresponding processes of algebra. The pupil is led by simple exercises, similar to those in arithmetic, to understand the use of letters to represent general and unknown numbers. Negative numbers are naturally introduced in connection with the extension of subtraction of arithmetical numbers. The meaning and use of positive and negative numbers, in the fundamental operations, are properly emphasized.

Equations and problems are distributed throughout the book. The importance of equivalent equations is not over-

looked, but is very briefly and simply considered in Chapter IV. Until that chapter is reached, the solutions of equations should be checked.

All the matter in the book is printed in large type, and much pains have been taken to make the pages open and attractive.

Any suggestions from teachers and others will be much appreciated.

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CHAPTER I.

INTRODUCTION.

GENERAL NUMBER.

1. Algebra, like Arithmetic, treats of number.

2. The examples

$$\frac{2}{7}+\frac{3}{7}=\frac{2+3}{7}=\frac{5}{7} \text{ and } \frac{5}{11}+\frac{4}{11}=\frac{5+4}{11}=\frac{9}{11}$$

are particular cases of the following principle:

The sum of two fractions which have a common denominator is a fraction whose denominator is the common denominator, and whose numerator is the sum of the numerators; or, more briefly stated,

$$\frac{1st\ num.}{com.\ den.}+\frac{2d\ num.}{com.\ den.}=\frac{1st\ num.+2d\ num.}{com.\ den.}.$$

This principle can be stated still more concisely by letting letters stand for the two numerators and the common denominator.

Let a stand for *1st num.*, b for *2d num.*, and c for *com. den.* We then have

$$\frac{a}{c}+\frac{b}{c}=\frac{a+b}{c}.$$

This relation states by means of letters, or symbols, all that is contained in the verbal statement. The letters a, b, and c stand for the terms of any two fractions, and therefore denote *any numbers whatever.*

In the first example above, $a=2$, $b=3$, $c=7$; in the second, $a=5$, $b=4$, $c=11$.