

# **A FIRST COURSE IN ALGEBRA**

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A first course in algebra by Webster Wells

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**WEBSTER WELLS**

**A FIRST COURSE  
IN ALGEBRA**



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BY

WEBSTER WELLS, S.B.

PROFESSOR OF MATHEMATICS IN THE MASSACHUSETTS  
INSTITUTE OF TECHNOLOGY

*Prof. Florian Cajori*

*compliments of*

*R. S. Short*

BOSTON, U.S.A.

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## PREFACE

IN the preparation of this text the author acknowledges joint-authorship with Robert L. Short.

This book meets the demand that the pupil be given an elementary algebra containing no more than can be accomplished in the time allotted to the subject. It is not intended for a complete course, but gives the student a good working knowledge of the subject through simultaneous quadratics. It should be followed by a second course by those intending to pursue the study of higher mathematical subjects. This book is sufficient preparation for geometry, and the frequent introduction of geometric ideas and geometric problems not only prepares for geometry but also makes that subject attractive to the learner.

This text is as brief as the algebra of years ago, and yet contains all that is good in modern mathematical thought. Attention is called to the introduction of graphical methods through simple horizontal and vertical measurements (Exercise 4, Exercise 41, problems 28-30). This procedure makes the transition to Cartesian coördinates a natural one. Teachers will find that the color scheme recommended in graphs will greatly aid the student in connecting related data. Pedagogical advantage is gained through the combining of related and reverse processes. (Chapters III, VII, X, XII, XIII.)

The use of the fractional exponent in operations involving surds is recommended, thereby avoiding confusion, since the four fundamental laws and the exponential laws of Multiplication, Division, Involution, and Evolution, are the only ones involved. The complete index will be found helpful to both pupil and teacher. No attempt is made toward technical

definition. Definitions for the beginner must be explanatory and descriptive. The lists of queries will aid in fixing both definitions and principles.

The authors thank the many teachers of mathematics who have made this book better and have brought it close to actual class-room conditions by their timely criticism and suggestion.

WEBSTER WELLS.



## CONTENTS

I. DEFINITIONS AND NOTATION. AXIOMS. EQUATIONS . . . . .	1
ALGEBRAIC EXPRESSIONS . . . . .	1
II. POSITIVE AND NEGATIVE NUMBERS . . . . .	10
III. ADDITION AND SUBTRACTION. PARENTHESES . . . . .	14
IV. MULTIPLICATION OF ALGEBRAIC EXPRESSIONS . . . . .	27
V. DIVISION OF ALGEBRAIC EXPRESSIONS . . . . .	35
VI. INTEGRAL LINEAR EQUATIONS . . . . .	42
VII. PRODUCTS AND FACTORS . . . . .	51
SOLUTION OF EQUATIONS BY FACTORING . . . . .	76
VIII. HIGHEST COMMON FACTOR . . . . .	80
LOWEST COMMON MULTIPLE . . . . .	83
IX. FRACTIONS . . . . .	85
X. FRACTIONAL EQUATIONS . . . . .	104
RATIO AND PROPORTION . . . . .	110
XI. SIMULTANEOUS LINEAR EQUATIONS . . . . .	121
GRAPHS . . . . .	121
XII. INVOLUTION AND EVOLUTION . . . . .	144
XIII. THEORY OF EXPONENTS . . . . .	158
IRRATIONAL NUMBERS . . . . .	166
IMAGINARY NUMBERS . . . . .	182
XIV. QUADRATIC EQUATIONS. GRAPHS . . . . .	187
EQUATIONS IN QUADRATIC FORM . . . . .	208
FACTORIZING OF QUADRATIC EXPRESSIONS . . . . .	209
XV. SIMULTANEOUS QUADRATIC EQUATIONS . . . . .	212
GRAPHS . . . . .	217
XVI. BINOMIAL THEOREM . . . . .	222
XVII. HINTS ON CHECKING . . . . .	228



# ALGEBRA

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## I. DEFINITIONS AND NOTATION

### SYMBOLS REPRESENTING NUMBERS

1. In Algebra the symbols usually employed to represent numbers are the *Arabic numerals* and the *letters of the alphabet*.

The numerals represent known or determinate numbers.

The letters represent numbers which may have any values whatever, or numbers whose values are to be found.

### EQUATIONS

2. The Sign of Equality,  $=$ , is read "*equals*."

Thus,  $a = b$  signifies that the number  $a$  equals the number  $b$ .

3. An Equation is an expression of equality.

The *first member* of an equation is the number to the left of the sign of equality, and the *second member* is the number to the right of that sign; thus, in the equation  $2x - 3 = 5$ , the first member is  $2x - 3$ , and the second member  $5$ .

### AXIOMS

4. An **Axiom** is a statement which is assumed as self-evident. Algebraic operations of finite numbers are based in part on the following axioms:

1. Any number equals itself.
2. Any number equals the sum of all its parts.
3. Any number is greater than any of its parts.
4. Two numbers which are equal to the same number, or to equal numbers, are equal.