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# **Durell's School Algebra**

**Durell Fletcher**

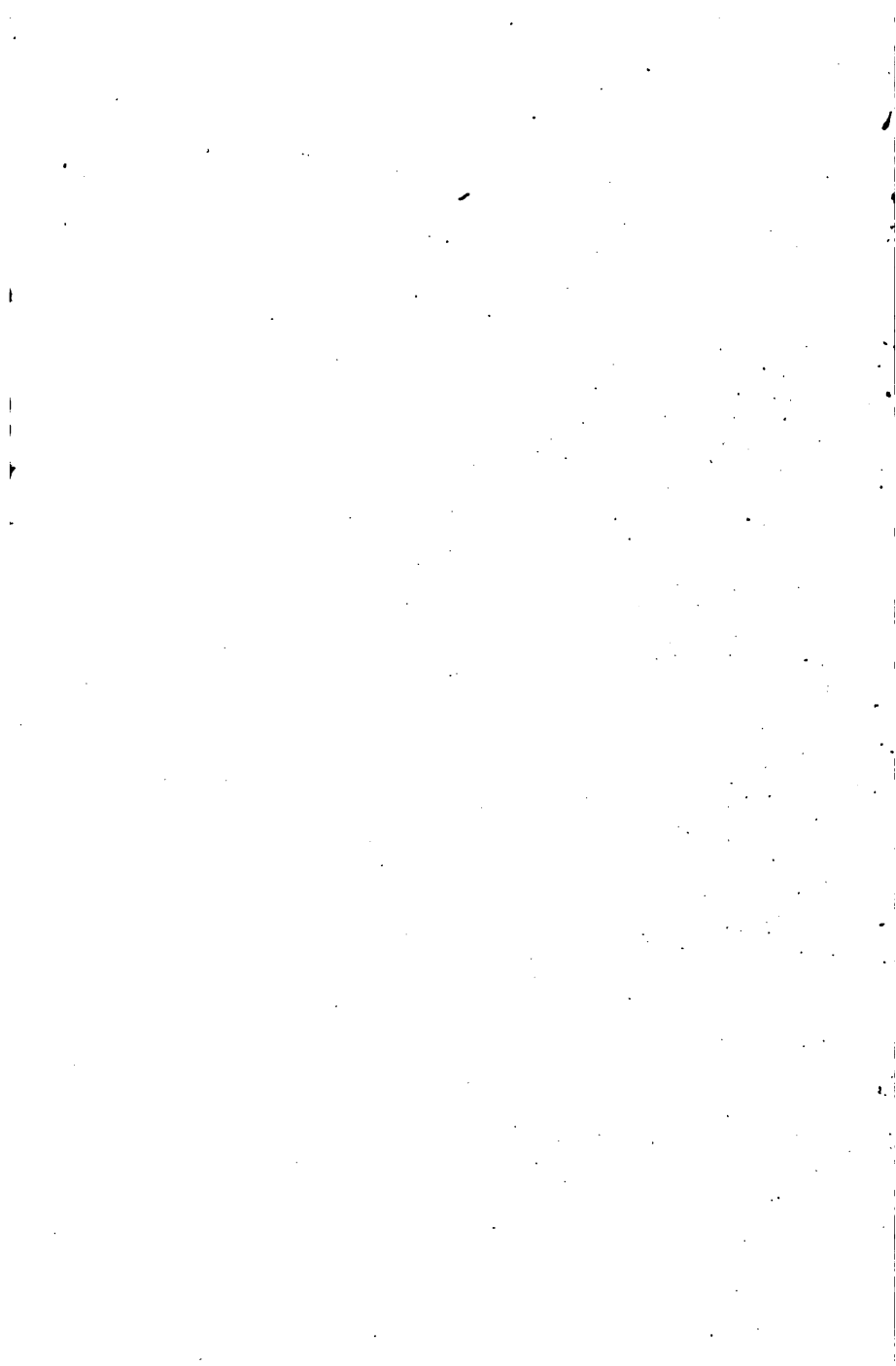
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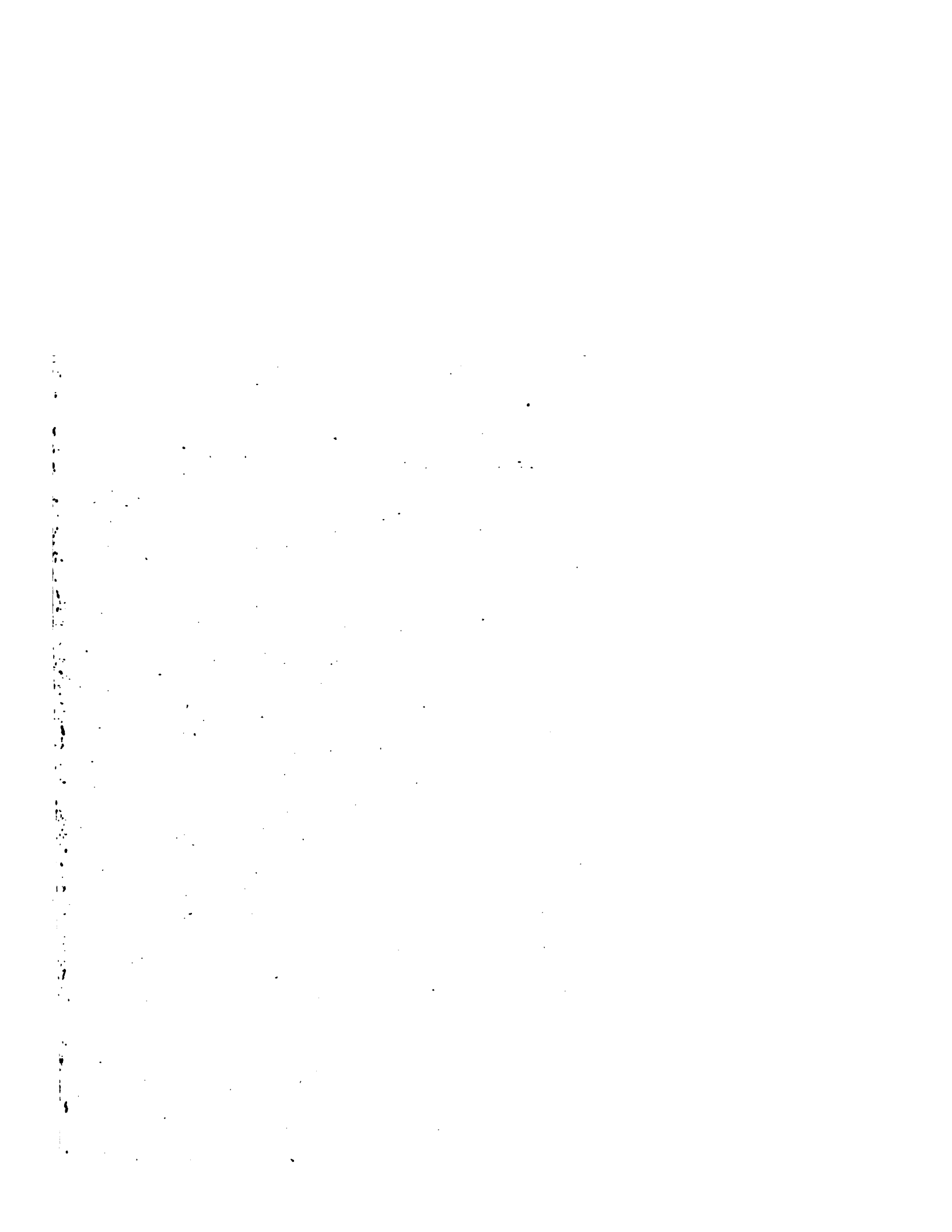
**Title: Durell's School Algebra**

**Author: Durell Fletcher**

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**VIETA**



**DESCARTES**



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**DURELL'S**  
**SCHOOL ALGEBRA**

BY

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**HEAD OF THE MATHEMATICAL DEPARTMENT IN THE  
LAWRENCEVILLE SCHOOL**



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## PREFACE

THE main object in writing this SCHOOL ALGEBRA has been to *simplify principles and give them interest*, by showing more plainly, if possible, than has been done heretofore, the *practical or common-sense reason* for each step or process. For instance, at the outset it is shown that new symbols are introduced into algebra not arbitrarily, but because of definite advantages in representing numbers. Each successive process is taken up for the sake of the economy or new power which it gives as compared with previous processes.

This treatment should not only make each principle clearer to the pupil, but should give increased unity to the subject as a whole. We believe also that this treatment of algebra is better adapted to the practical American spirit, and gives the study of the subject a larger educational value.

Among the special features of this SCHOOL ALGEBRA, the following may be mentioned:

A large number of *written problems* are given in the early part of the book, and these are grouped in types which correspond in a measure to the groups used in treating original exercises in the author's GEOMETRY.

Many *informational facts* are used in the written problems. The central and permanent numerical facts in various departments of knowledge have been collected and tabulated on pages 496-504 for use in making problems. Similarly the most important



formulas in arithmetic, geometry, physics, and engineering have been tabulated for use by teacher and pupil (pp. 496, 497).

The *self-activity of the pupil* is aroused by examples which require the pupil to invent and solve problems of a specified kind, material for such examples being made available in the tables of formulas and numerical facts.

Many of the examples in the book require a frequent *review of the principles of arithmetic*, as of decimal fractions and percentage.

Numerous and thorough *reviews* of the portion of the Algebra already studied are also called for. A unique feature is the series of spiral reviews of the preceding part of the book by means of examples at the end of Exercises. *Oral work* is called for in like manner and is also emphasized in special important Exercises.

The *utilities in symbolism in general*, apart from technical algebra, are brought out in a special Exercise (pp. 249, 250) and thus the direct practical value of the study of algebra is much broadened.

The *history of algebra* is discussed in Chapter XXVI, and questions on this chapter are inserted in appropriate places in the text.

The author wishes to express his indebtedness to Professor William Betz of the East High School, Rochester, New York, and to Dr. Henry A. Converse of the Polytechnic Institute, Baltimore, Maryland, for important aid in preparing the book. He is indebted also to *School Science and Mathematics* and the *Mathematics Teacher* for a few of the problems.

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# SCHOOL ALGEBRA

## CHAPTER I

### ALGEBRAIC SYMBOLS

#### 1. The Use of Letters.

Ex. Walter and Harold made \$27 by gardening one summer. Walter, who was older and stronger, received a double share of the profits. How much did each receive?

#### SOLUTION WITHOUT THE AID OF X

1 share = Harold's part of the profits  
2 shares = Walter's part of the profits  
1 share + 2 shares = \$27  
3 shares = \$27  
1 share = \$9, *Harold's part*  
2 shares = \$18, *Walter's part*

#### SOLUTION BY AID OF X

Let  $x$  = Harold's part of the profits  
Then  $2x$  = Walter's part of the profits  
Hence  $x + 2x = \$27$   
 $3x = \$27$   
 $x = \$9$ , *Harold's part*  
 $2x = \$18$ , *Walter's part*

We see that by use of the letter  $x$  the solution is much shortened.

2. Algebra is that branch of mathematics which treats of number by the extended use of symbols.

Later algebra comes to have a wider meaning.  
Algebra may also be briefly described as generalized arithmetic.