

**GRADATIONS IN ALGEBRA, IN
WHICH THE FIRST
PRINCIPLES OF ANALYSIS
ARE INDUCTIVELY EXPLAINED**

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Gradations in algebra, in which the first principles of analysis are inductively explained by
Richard W. Green

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RICHARD W. GREEN

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RECOMMENDATIONS.

From Rev. C. H. Alden, Principal of the Philadelphia High School for Young Ladies.

MR. GREEN :

Dear sir,—I am greatly pleased to find, that, in your "Gradations in Algebra," recently published, you have rendered the elements of that department of the Mathematics so attractive to the young student. It has long surprised me that this interesting method of analysis has been so entirely excluded from our common schools. With your valuable aid, however, this neglect can no longer find a suitable apology. I anticipate the introduction of your excellent work into both our private primary and public schools.

Very respectfully,

C. H. ALDEN.

RICHARD W. GREEN :

Sir,—I have examined your "Gradations in Algebra" with much care, and have no hesitation in saying that in my opinion you have fully attained your object in forming "an easy introduction to the first principles of algebraical reasoning," and of furnishing "in the same course a popular exposition of the most important elements of arithmetic." To write a work on abstruse science, adapted to the comprehension of youth, is a work of extreme difficulty. I feel that I offer high but deserved and just praise when I say that in the book before me you have fully succeeded.

Yours, &c.

JAS. RHODES,

Principal of N. W. Grammar School, Philad.

Dear sir,—Your "Gradations in Algebra" appears to me to supply what has long been wanted by those who are commencing that study, viz. an initiatory text-book at once small, clear, well arranged, and comprehensive. It meddles with nothing beyond the capacity of a school-boy. It is well supplied with such examples as show the learner the use of what he is studying. I would rather put your book in the hands of a beginner than any other work on the same subject now in common use.

Yours very respectfully,

JNO. W. FAIRES.

I examined "Green's Gradations in Algebra," and was so well pleased with it, that I introduced it into our school. I have made use of it one term, and can bear testimony that it has equaled my expectations. I consider it as occupying an important link between arithmetic and literal algebra. In my judgment, we have long needed such a work.

JOHN D. POST,

Teacher of Mathematics in Hartford Grammar School.

From Porter H. Snow, A. M., formerly Principal of the Hartford Centre School, and now Principal of Brainard Academy, Haddam, Conn.

I have examined critically your "Gradations in Algebra," and find it admirably adapted to fulfil its design. There is nothing so good on the subject in the English language for a student to read before entering college. All the mystery that clothes mathematics during the early part of a collegiate course of study will be solved and made plain, if the student will spend a few weeks on this introduction to algebra. It is also a fine work for classes in schools. And I would recommend its introduction into primary and higher schools in preference to any treatise on algebra I have ever seen. It is also the only thing of the kind I have met with, suitable for a student to peruse without an instructor.

York, Pa., Nov. 30th, 1841.

After a careful examination of Mr. Green's "Algebra," we have no hesitation in expressing our decided approbation of the work. The clearness of the explanations, the judicious and systematic arrangement of the parts, and the gradual manner in which the student is led on from the first principles to the more difficult parts of the science, render it, in our view, preferable to any we have seen for primary instruction.

DANIEL KIRKWOOD,

Teacher of Mathematics, York Co. Academy.

D. M. ETTINGER,

Principal of the High School, York, Pa.

The great excellence of this work is, that it brings the pupil on gradually. Only one difficulty is presented at a time; and upon this, explanations and examples are multiplied till the pupil becomes so familiar with the subject that he almost wonders where the difficulty is at which he first stumbled. The examples are numerous; the few rules (and they are enough) are admirably expressed, in plain, concise language. On the whole, we may say, that if a youth is to begin the study of algebra, this should be his first book.

Extract from the North American.

J. Rajoni

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THE FIRST PRINCIPLES OF ANALYSIS

ARE

INDUCTIVELY EXPLAINED.

ILLUSTRATED BY

OBVIOUS EXERCISES,

AND MADE SUITABLE FOR PRIMARY SCHOOLS.

BY

RICHARD W. GREEN, A. M.,

AUTHOR OF ARITHMETICAL GUIDE, LITTLE RECKONER, ETC.

PHILADELPHIA:

PUBLISHED BY E. H. BUTLER & CO.

1850.

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{ Chamber of the Controllers of Public Schools,
First School District of Pennsylvania.

PHILADELPHIA, November 15, 1849.

At a meeting of the Controllers of Public Schools, First District of Pennsylvania, held at the Controllers' Chamber, on Tuesday, November 13, 1849, the following Resolution was adopted:—

Resolved, That Green's Algebra be introduced, as a Class-Book, into the Grammar Schools of the District. From the minutes.

R. J. HEMPHILL, *Secretary*.

Secretary's Office, Harrisburg, Feb. 4, 1843.

MR. RICHARD W. GREEN:

SIR,—I have examined the work prepared by you for the use of primary schools, entitled "Gradations in Algebra." It meets with my approbation, and I am much pleased with its design and arrangement. I consider it admirably calculated to aid the pupil at the commencement of the science, also to give him a general knowledge of it.

It is, in my opinion, well adapted to the use of common schools, where there are students who have not the time or means of consulting more extended treatises upon the subject. I hope it may be introduced generally into our schools throughout the state.

I am yours respectfully,

A. V. PARSONS,

Superintendent Common Schools.

Entered according to the Act of Congress, in the year 1838, by

RICHARD W. GREEN,

in the Clerk's Office of the District Court of the Eastern District of Pennsylvania.

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✂ For the convenience of those teachers who may wish to adopt the author's plan of using this book, a key has been prepared containing the solutions of all the examples and problems. It will also save the teacher much time when he wishes to find for his pupil the errors in his work.

CONTENTS.

Preface..... Page 7

NUMERAL ALGEBRA.

Preliminary Remarks.....	11
Addition and Subtraction of Simple Quantities.....	18
General Rule for uniting Terms.....	19
Multiplication and Division of Simple Quantities.....	23
Simple Equations.....	16
I. Equations Solved by uniting Terms.....	24
II. Addition of Compound Quantities.....	22
Transposition by Subtraction.....	30
Equations Solved by Transposition.....	31
III. Transposition by Addition.....	34
Equations.....	34
IV. Transposition of the Unknown Quantity.....	37
Equations.....	38
V. Multiplication of Compound Quantities by Simple Quantities....	42
Equations.....	44
VI. Fractions.....	48
Equations.....	52
VII. Fractions of Compound Quantities.....	57
Equations.....	58
VIII. Division of Fractions and Fractions of Fractions.....	61
Equations.....	64
IX. Subtraction of Compound Quantities.....	67
Equations.....	73
X. Uniting Fractions of different denominators.....	69
Ratio and Proportion.....	75
Equations.....	78

XI. Equations with two Unknown Quantities.....	Page 82
First method of Extermination.....	83
Equations.....	88
XII. Second method of Extermination.....	93
Equations.....	94
XIII. Third method of Extermination.....	97
Equations.....	98
XIV. Equations with several Unknown Quantities.....	101

LITERAL ALGEBRA.

General Principles.....	103
Addition and Subtraction of Algebraical quantities.....	112
Multiplication of Algebraical Quantities.....	117
General Properties of Numbers.....	125
Division of Algebraical Quantities.....	128
Division by Compound Divisors.....	136
Reduction of Fractions to lower Terms.....	143
Multiplication where one factor is a fraction.....	146
Reducing Complex Fractions to Simple ones.....	148
Division of Fractions.....	152
Fractions of Fractions.....	153
Uniting Fractions of different denominators.....	156
Division by Fractions.....	159
General Theory of Equations with two unknown quantities.....	162
Involution and powers.....	165
Evolution.....	172
Extraction of the Second Root of Numbers.....	177
XV. Pure Quadratic Equations.....	181
Equations.....	182
XVI. Affected Quadratic Equations.....	185
Equations.....	190

P R E F A C E .

THE object of the author, in composing this treatise, was to form an easy introduction to the first principles of algebraical reasoning; and also to embrace, in the same course, a popular exposition of the most important elements of arithmetic. And he believes that he has been enabled to combine the rudiments of both, in such a manner as to make the operations of one illustrate the principles of the other.

In order that this method of treating the subject might preserve its chief advantage, especially in the initiatory course of the study; the work has been divided into two parts—*Numeral Algebra* and *Literal Algebra*.

In *Numeral Algebra* I have treated of the several primary arithmetical operations; first making them intelligible to very young pupils, and then exhibiting them under the algebraical notation. By this means, as every lesson in algebra is immediately preceded by corresponding numerical exercises, the transition from one to the other has been made so trifling, that the pupil will feel at each step that he has met with nothing more than what he has already made himself familiar with in a different dress.

Besides, as algebraical operations require the exercise of abstraction in a greater degree than the pupil is supposed to be accustomed to, I have taken care that the exercise on each of the fundamental rules, shall be followed by a selection of problems to be solved by equations.