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A WORD ABOUT THE AUTHOR OF THIS SERIES

John W. Reik is the founder and president of *John Reik & Associates LLC, Business Training and Consulting*. This Minnesota-based firm, founded in 1980, works with both manufacturing and service companies in various business areas. John is also a founder and principal of Jomar Productions L.L.P., a Minnesota-based video production company dedicated to creating high-quality videotape training programs for the banking industry.

In addition, John has been a lecturer and Assistant Professor of Finance at the University of Minnesota for over 33 years and spent eight years as the senior credit trainer and manager of Credit and Finance Education for First Bank System [now U.S. Bank.] Previous to his position at the University of Minnesota, John worked as a financial analyst in the Automotive Assembly Division of Ford Motor Company.

John is an honors graduate of Purdue University and the University of Minnesota and holds degrees in management, accounting, finance, and law. He is past chairman of Robert Morris Associates' Minnesota Chapter Education Committee, a licensed attorney, and a member of the Better Business Bureau's Senior Council of Arbitrators.

John's published articles include: *Acquisition Financing: The EBIT Multiple Trap, Cash Flow and Intercompany Investments Parts I and II, Improving Capital Expenditure Cash Flow Calculations*, and *How to Calculate the "Boil Over" Point of an Acquisition*.

A WORD ABOUT THIS SERIES

As a lecturer and assistant professor of corporate finance for over 30 years, I have seen many students come and go. Unfortunately, over this same period of time, I have come to one inescapable conclusion: many of them aren't very good at simple algebra, *and it's not usually their own fault.*

Rather, it's because algebra isn't always taught well, so important basic points are often skipped over by instructors who find them "boring" and want to spend their time talking about more advanced topics.

Therefore, when I wrote *The Basics of Algebra* series, I had several important goals in mind:

- I wanted to start at as basic a level as I could, by covering the meanings of such things as a plus sign and an equals sign, so that *anyone* could pick up this series and start where they need to.
- I wanted to explain things as simply as I could, and to focus on truly basic material, rather than the extensions and detours that so often plague "basic" textbooks.
- I wanted to write for individuals who didn't know much, if anything, about the topic, as opposed to writing for textbook reviewers who already know the topic completely and get bored whenever they see what they consider to be "obvious" points being made.
- I wanted the series to have two separate and standalone volumes, thereby allowing interested readers to acquire only the volume that they needed, as opposed to acquiring a single 380 page manuscript that would go largely unread.
- I wanted to build logically from one topic to the next.
- I wanted to provide lots and lots of examples and practice opportunities.

The result of my efforts is the two-volume series called *The Basics of Algebra*.

This series is appropriate for *any* student at *any* level who wants a deeper and more meaningful understanding of basic algebraic concepts than is conveyed through most classroom textbooks.

This series is *also* extremely useful for parents who are trying to help their younger children learn algebra. In these cases, this series provides a clear and concise reference source for concepts that were learned some years ago and are now just a little too "fuzzy" for the parents to remember.

All-in-all, I'm pleased with *The Basics of Algebra* series, and I hope that you are as well. Please feel free to share your comments with me on the johnreik.com website; I'm always interested in hearing about ways to improve the series.

- The transitive property of equality
- If you want to know what a variable equals, put it all by itself on one side of an equation

Introduction to multiple variables

Multiplication as short-hand addition

The marvelous zero

The behind-the-scenes one

Negative numbers

Absolute values

Fractions

The distributive property

Rational and irrational numbers

Introduction to exponents

Exponents in multiplication problems

Exponents in division problems

Square roots

Higher-order roots

Real numbers

Introduction to proofs

Equations versus expressions

Factors and terms

Multinomials, binomials, monomials, and polynomials

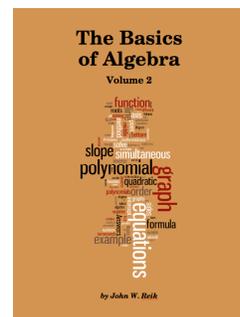
Simplifying arithmetic expressions

Multiplying multinomials

Adding multinomials

Tricks for dealing with complicated equations

THE BASICS OF ALGEBRA VOLUME 2



Topics: In today's technological age it is becoming increasingly more difficult to “get by” without a firm grasp of entry-level algebraic rules and principles, yet many individuals have never studied these rules and principles in a systematic *and understandable* way.

The purpose of this self-study book is to build upon the basic rules and principles that were covered in Volume 1 in a compact *and understandable* way and then to provide lots and lots of practice. The topics in Volume 2 are more advanced than the topics in Volume 1.

This volume is useful both for those who desire a relatively painless review of these rules and principles, as well as for those who have never had an opportunity to study them at all.

Length: Over 160 pages, including more than 200 problems and examples.

Contents: Functions and inverse functions

- What is an inverse formula?
- What is a function?
- What is a function's argument?
- What notation is used for functions?
- What is the benefit of using this function notation?
- What is a function's domain?
- What is a function's range?
- What is an inverse function?
- How can I easily find an inverse function?

Triangles

- What are the various types of triangles?
- What do the terms right triangle, legs, and hypotenuse mean?
- What is the Pythagorean Theorem and how is it used?

Introduction to graphing: graphing a line

- How can I graph a line?
- What is the slope of a line?

How can I measure the lengths of lines that are drawn on a graph?

- What does a negative x or a negative y mean on a graph?
- Can functions be graphed?
- How can I calculate the slope of a line?
- What is the shape of the graph of a line?

Substitution method for simultaneous linear equations

- How can I find the intersection point of two lines using algebra?
- What is the intersection point of two parallel lines?
- What is the intersection point of two lines that are the same?
- Is there a general formula for solving simultaneous equations using the substitution method?
- How can I use this general formula for solving simultaneous equations using the substitution method?

Elimination method for simultaneous linear equations

Solving multiple simultaneous equations

- How can I find the intersection point of multiple simultaneous equations?
- Why is this way of solving multiple simultaneous equations called triangularization?

Quadratic equations

- What is a polynomial?
- How do you determine the degree of a polynomial?
- What is a quadratic equation?
- What is the root of a quadratic polynomial and how do I find it?
- Can a quadratic polynomial have just one root?
- Are quadratic polynomials always capable of being factored?
- What is the shape of the graph of a quadratic polynomial?

Higher-order polynomials

- How do you determine the degree of a polynomial?
- What is a higher order polynomial?
- What is the difference between a polynomial and a quadratic equation?
- What is the shape of the graph of a higher order polynomial?
- Are there patterns to the changes in the shapes of higher order polynomial graphs?
- How many roots do higher order polynomials have?

Synthetic division

- What is synthetic division and how is it used?
- How do you get started in a synthetic division problem?

Matrices

- What is a matrix?
- What are matrices used for?
- How do matrices and triangularization compare?
- How are matrices classified?
- How are matrices added?