

Algebra

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Algebra

Preface



This book requires that you first read **Arithmetic**.

Algebra - is the branch of mathematics concerning the study of the rules of operations and relations, and the constructions and concepts arising from them, including terms, polynomials, equations and algebraic structures.

You've been asked to buy peanuts for you and your friends at a football game. You've collected \$12.50. One bag is \$2.75. You want to know how many bags you can buy. This is an algebra problem! Related problems are how much money will be left over, and what should you buy or in what proportions should you return the extra money to your friends.

Contents

Introduction to Mathematics

1. About This Book



1. [What_is_math,_exactly?](#) - *And why should I care?*
2. [Who should read this book](#) - *And what to expect*

Numbers, Variables and Relationships

How to use numbers and variables to find out unknown information?

1. **Review**

1. Elementary Arithmetic
2. Order of Operations

2. **Numbers and Variables**

- ▣ 1. Algebra and Properties Of Real Numbers
- 2. Division is not commutative
- 3. Rules of Exponents
- 4. Roots and Radicals
- 5. Variables
- 6. Sets

3. **Equations With One Variable**

- ▣ 1. What are Equations?
- 2. Solving Equations With One Variable
- 3. Word Problems

4. **Inequalities**

- ▣ 1. Different Types of Relationships
- 2. Interval notation and Graphing Intervals
- 3. Solving Inequalities

Linear Functions An Introduction To Graphing

Maths is a method of solving problems. You take information you know, and by manipulating it using mathematical principles, you can find information you don't know. Functions are the mathematical framework for solving problems. They have parameters, rules, and ways of being solved. This section will introduce you to common functions and how to use them.

1. Introduction to Linear Functions



1. Functions
2. Graphing Linear Functions



1. The Coordinate (Cartesian) Plane
 2. Linear Equations and Functions
 3. The X and Y Intercepts
 4. Slope
 5. Standard Form and Solving Slope
3. Graphing Inequalities
 4. The Pythagorean Theorem and The Distance Formula
 5. Absolute Value
 6. Systems of Equations
 7. Compound and Absolute Value Inequalities
 8. Graphing Systems of Inequalities
 9. Other Types of Graphs

Polynomials

1. Polynomials
 1. Factoring Polynomials
 2. Completing the Square
 1. Square Root is Positive (To be merged)
 3. Quadratic Formula
 4. Binomial Theorem

Graphing Polynomials

1. More about Graphing
 1. Graphing Polynomials
 2. Inverses of Functions
 3. Compound and Absolute Value Inequalities For Polynomials
 4. Graphing Systems of Inequalities For Polynomials

Conic Sections

1. Conic Sections
 1. Circle
 2. Ellipse
 3. Parabola
 4. Hyperbola

Complex Numbers

1. Complex Numbers
 1. More about the Quadratic Formula
 2. Yet more about Polynomials and the "Fundamental Theorem of Algebra"

Elementary Probability and Statistics

1. Introduction to Probability and Statistics
 1. Probability
 2. Statistics
 3. Scatter Plots

Ongoing merging work

TO DO

Fix algebra for Q & R in Proportions or Ratios section

Add word problems to multiplication

Add word problems to division

Add word problems to exponents

Add word problems to roots

Add word problems for possible relationships part of inequalities

Add graphics for multiplying by 1 and -1 to description of special case multiply by -1

Add description for special case Going back to equality

Fill in example of half area function

Fix contents, Clarify Explanation

Move Todos here ... or fill 'em in

Why use standard form vs. Slope Intercept form? Need more context.

Continue Creating Links between pages.

Continue Creating Standard Algebra Heading ... Continue through Table of Contents

Leap in sophistication ... End of the conversational tone. Need to make friendlier, simpler

To be merged/unordered

Algebra

1. In this book
 1. [Theory](#)
 2. [Iteration](#)
 3. [Stemplots](#) (Do we want this?)
 4. [Talk:Algebra/ToInclude](#)
 5. [Arithmetic/Numerical Axioms](#) (Was orphaned from the book, should keep an eye out for others)
 6. [Equalities and Inequalities](#) (Was orphaned from the book)
 7. [Algebra](#)
 8. [Proofs/Exercises](#) Don't forget to merge this page *out* of this book.
 9. [Quadratic functions](#)
 10. [Solving equations](#)
 11. [Theory of Equations](#)
2. Redirect to another book (why?)
 1. [Logarithms](#)
3. [Closure](#)
 1. [Algebra/Closure/Answers](#)