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BONUS Curriculum eBook (PDF Lessons)

Comprehensive Math Curriculum

Course Contents (Algebra 1 - 8th / 9th)

COURSE NAME: ALGEBRA 1

1. The Basics

1.1 Understanding Numbers

- 1.1.1 Whole Numbers
- 1.1.2 Positive and Negative Numbers
- 1.1.3 Integers
- 1.1.4 Decimals
- 1.1.5 Real Numbers
- 1.1.6 Prime Numbers
- 1.1.7 Rational & Irrational Numbers
- 1.1.8 Percents

1.2 Fractions

- 1.2.1 Defining Fractions
- 1.2.2 Reducing Fractions
- 1.2.3 Adding Fractions
- 1.2.4 Adding Fractions and whole numbers
- 1.2.5 Multiplying fractions
- 1.2.6 Multiplying fractions and whole numbers
- 1.2.7 Subtracting Fractions
- 1.2.8 Subtracting Fractions and whole numbers
- 1.2.9 Dividing Fractions
- 1.2.10 Dividing Fractions and whole numbers
- 1.2.11 Mixed Fractions Operations

1.3 Basic Real Number Operations

- 1.3.1 Number Comparisons
- 1.3.2 Properties of Real Numbers
- 1.3.3 Additions
- 1.3.4 Subtractions
- 1.3.5 Multiplication
- 1.3.6 Division
- 1.3.7 Order of Operation
- 1.3.8 Mixed Operations

1.4 Exponents

- 1.4.1 Understanding Exponents
- 1.4.2 Multiplying Exponents with the Same Base
- 1.4.3 Multiplying Fractional Exponents with the Same Base
- 1.4.4 Multiplying Exponents Raised to a Power
- 1.4.5 Expressions Raised to a Power
- 1.4.6 Fractions Raised to a Power
- 1.4.7 More Multiplying Exponents
- 1.4.8 Negative Exponents
- 1.4.9 Multiplying with Negative Exponents
- 1.4.10 Dividing with Exponents

1.5 Rates and Dimensional Analysis

2. Introduction to Variables and Algebraic Expressions

2.1 Defining Variable

2.2 Basic Operations with Variables

- 2.2.1 Additions and Subtractions
- 2.2.2 Multiplications
- 2.2.3 Divisions
- 2.2.4 Mixed Operations with Variables

2.3 Fractions with Variables

2.4 Canceling with Variable

2.5 Simplifying and Evaluating Expressions

2.6 Combining Like Terms

2.7 Word Problems

6. Solving Linear Inequalities

- 6.1 Linear Inequalities
- 6.2 Solving Linear Inequalities by Addition and Subtraction
- 6.3 Solving Linear Inequalities by Multiplication and Division
- 6.4 Solving Multi-step Inequalities
- 6.5 Solving Compound Inequalities
- 6.6 Solving Open Sentences Involving Absolute Value
- 6.7 Graphing Inequalities with two Variables
- 6.8 Solving Linear Inequalities Using Solutions Sets

7. Solving Systems of Linear Equations and Inequalities

- 7.1 Graphing Systems of Equations
- 7.2 Substitution
- 7.3 Elimination using Addition and Subtraction
- 7.4 Elimination using Multiplication
- 7.5 Graphing System of Inequalities

8. Polynomials

- 8.1 Monomials and Degree of Monomials
- 8.2 Multiplying Monomials
- 8.3 Dividing Monomials
- 8.4 Polynomials and Degree of Polynomials
- 8.5 Adding and Subtracting Polynomials
- 8.6 Multiplying a Polynomial by Monomial
- 8.7 Multiplying Polynomials
- 8.8 Special Products of Polynomials
- 8.9 Difference of Squares
- 8.10 Monomial Roots and Powers
- 8.11 Dividing a Polynomial by Monomial

9. Factoring

- 9.1 Factors and Greatest Common Factor
- 9.2 Factoring Using the Distributive Property
- 9.3 Factoring Trinomials: $x^2 + bx + c$
- 9.4 Factoring Trinomials: $ax^2 + bx + c$
- 9.5 Factoring Difference of Squares
- 9.6 Perfect Squares and Factoring
- 9.7 Solving Quadratic Equations by factoring
- 9.8 Simplifying Algebraic Ratios
- 9.9 Solve Algebraic Proportions

10. Quadratic Equations and Functions

- 10.1 Solve Quadratic Equations by the Square Root Method
- 10.2 Solving Quadratic Equations by Completing the Square
- 10.3 Solving Quadratic Equations using the Quadratic Formula
- 10.4 Graphing Quadratic Equations
- 10.5 Solving Quadratic Equations by Graphing
- 10.6 The Discriminant
- 10.7 The Sum and the Product of the Solutions
- 10.8 Solving Quadratic Equations with Perfect Squares
- 10.9 Solving Quadratic Equations That Contain Radical Expressions
- 10.10 Word Problems Using Quadratic Formula

11. Radical Expressions and Triangles

- 11.1 Square Roots
- 11.2 Simplifying Radical Expressions
- 11.3 Operations with Radical Expressions
 - 11.3.1 Adding and Subtracting Radical Expressions
 - 11.3.2 Multiplying Radical Expressions
 - 11.3.3 Dividing Radical Expressions

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Course Contents (Algebra 1 - 8th / 9th Grade Conti...)

3. Solving Linear Equations

- 3.1 Writing Equations
- 3.2 Solving Equations Using Addition and Subtraction
- 3.3 Solving Equations Using Multiplication and Division
- 3.4 Solving Multi-step Equations
- 3.5 Solving Equations with the Variable on each side
- 3.6 Ratios and Proportions
- 3.7 Solving Equations and Formulas

4. Graphing Relations and Functions

- 4.1 The Number Line and the Coordinate Plane
- 4.2 Transformations on the Coordinate Plane
- 4.3 Relations
- 4.4 Equations as Relations
- 4.5 Graphing Linear Equations
- 4.6 Functions
- 4.7 Arithmetic Sequences
- 4.8 Writing Equations from Patterns
- 4.9 Interpreting a Graph Representing a Given Situation
- 4.10 Sketching a Graph Representing a Given Situation

5. Linear Equations

- 5.1 Slope
- 5.2 Slope-Intercept Form
- 5.3 Writing Equations in Slope-Intercept Form
- 5.4 Writing Equations Using Point and Slope
- 5.5 Writing Equations in a Point-Slope Form
- 5.6 Graphing Linear Equations Using Slope/Intercept Method
- 5.7 Writing Parallel Equations
- 5.8 Writing Perpendicular Equations

11.4 Pythagorean Theorem

- 11.5 The Distance Formula
- 11.6 Similar Triangles
- 11.7 Cube Roots
- 11.8 Rational Exponents
- 11.9 Comparing Real Number Expressions