

Beginning Algebra

1. Review of Pre-Algebra

1.1 Review of Integers

1.2 Review of Fractions

1.3 Review of Decimal Numbers and Square Roots

1.4 Review of Percents

1.5 Real Number System

1.6 Translations: Statements To Mathematical Expressions

1.7 Review of Basic Geometry

1.8 Review of Basic Fundamentals

2. Linear Equations/Inequalities in One Variable

2.1 Simplifying Expressions

2.1.1 Identify Terms & Numerical Coefficients

2.1.2 Identifying and Combining Like Terms

2.1.3 Simplifying Expressions

2.1.4 Build Expressions from Word Phrases

2.2 Solving Linear Equations in one variable

2.2.1 Identify Linear Equations

2.2.2 Verifying Solutions of Linear Equations

2.2.3 Solve One-Step Equations

2.2.4 Solving Equations of the Type $ax + b = c$

2.2.5 Use Distributive Property to Solve Equations

2.2.6 Solve General Linear Equations

2.3 More on Solving Linear Equations

2.3.1 Solve Equations with Fractions and Decimals

2.3.2 Equations with No Solutions or many Solutions

2.4 Applications of Linear Equations

2.4.1 Solving Applied Problem

2.4.2 Solve Problem involving one unknown

2.4.3 Solve Problems with More Than One Unknown

2.5 Literal Equations

2.5.1 Solve for One Variable, given the values of others

2.5.2 Solve for One Variable in Terms of Other Variable

2.5.3 Use of Formulas for Applications

2.6 Ratios and Proportions

2.6.1 Write Ratios

2.6.2 Solve Proportions

2.6.3 Solve applied problems involving Ratios

2.7 More Applications

2.7.1 Examples of Applications

2.8 Solutions of Linear Inequalities

2.8.1 Intervals and Their Graphs

2.8.2 Addition Property of Inequality

2.8.3 Multiplication Property of Inequality

2.8.4 Solving Linear Inequalities

2.8.5 Three Part Inequalities

2.8.6 Translating Statements of Inequality

2.9 Equations and Inequalities Involving Absolute Values

2.9.1 Solve Simple Equations Involving Absolute Value

2.9.2 Solve Simple Inequalities Involving Absolute Value

2.9.3 Identify Absolute Value Equations or Inequalities having No Solution

3. Linear Equations/Inequalities in Two Variables

3.1 Linear Equations in Two Variables

3.1.1 Solution of a Linear Equation

3.1.2 Completing a Table of Values

3.1.3 Plotting Ordered Pairs

3.1.4 Identify Relationships between components of ordered pairs

3.2 Graphing Linear Equations in Two Variables

3.2.1 Graphing a linear equation using points

3.2.2 Graphing a linear equation Using intercepts

3.3 Slope of a Line

3.3.1 Slope of a Line Through Two Given Points

3.3.2 Finding the slope of a line from the equation of the line

3.3.3 Slope of Parallel and Perpendicular Lines

3.4 Equation of a Line

3.4.1 Slope-Intercept Form of a Line

3.4.2 Graphing a Line in the Slope-Intercept Form

3.4.3 Equation of a line given slope and any point on the line

3.4.4 Writing Equations in slope intercept or Standard Form

3.4.5 Equation of a line in Two-point Form

3.5 Graphing Linear Inequalities in 2 variables

3.5.1 Graphing Inequalities in 2 variables and Basic Principles

3.6 Functions and Relations

3.6.1 Definition of a Relation

3.6.2 Definition of a Function

3.6.3 Graph of a Relations

3.6.4 Vertical Line Test Notation

3.6.5 Functional Notation $f(x)$

4. Systems of Linear Equations and Inequalities

4.1 Solving by Graphs

- 4.1.1 Identifying a Solution of a system of Linear...
- 4.1.2 Solving by Graphing
- 4.1.3 Intersecting, Parallel, and Coincident Lines

4.2 Solving using Substitution

- 4.2.1 Solving by Substitution
- 4.2.2 Intersecting

4.3 Solving using Elimination by Addition

- 4.3.1 Solve linear systems by Addition Method
- 4.3.2 Identify the Graphs of Systems

4.4 Solving Systems of Linear Inequalities

- 4.4.1 Solving a system of linear Inequalities

4.5 Applications

- 4.5.1 Applications

5. Exponents and Polynomials

5.1 Exponents

- 5.1.1 Identify and use Exponents
- 5.1.2 Product Rule
- 5.1.3 Power Rules for Exponents

5.2 Polynomials

- 5.2.1 Polynomials, Terms, Coefficient
- 5.2.2 Evaluating a Polynomial
- 5.2.3 Adding Polynomials
- 5.2.4 Subtracting Polynomials

5.3 Multiplication of Polynomials

- 5.3.1 Product of monomial & polynomial
- 5.3.2 Product of Two Polynomials
- 5.3.3 FOIL Method

5.4 Special Products

- 5.4.1 Square of Binomials
- 5.4.2 Product of Sum and Difference
- 5.4.3 Expand Higher Powers of Binomials

5.5 Integer Exponents

- 5.5.1 Negative Exponents
- 5.5.2 Quotient Rule for Integer Exponents

5.6 The Quotient of Two Polynomials

- 5.6.1 Dividing a Polynomial by a Monomial
- 5.6.2 Quotient of Two Polynomials

5.7 Scientific Notation

- 5.7.1 Express Numbers in Scientific Notation
- 5.7.2 Converting from Scientific Notation
- 5.7.3 Application: Using Scientific Notations

6. Factoring Quadratic Equations and Inequalities

6.1 Factors GCF

- 6.1.1 Greatest Common Factor
- 6.1.2 Factoring out the G.C.F
- 6.1.3 Factor by grouping

6.2 Factoring Trinomials

- 6.2.1 Factoring Trinomial of the Type $x^2 + bx + c$
- 6.2.2 Factoring Trinomial ax^2+bx+c , $a \neq 0$ and $a \neq 1$
- 6.2.3 Miscellaneous Examples

6.3 Special Factorization

- 6.3.1 Difference of Two Squares
- 6.3.2 Perfect Square Trinomials
- 6.3.3 Sum of Two Cubes
- 6.3.4 Difference of Two Cubes

6.4 Solving Quadratic Equations by Factoring

- 6.4.1 Zero Factor Property
- 6.4.2 Solving Quadratic Equations

6.5 Applications of Quadratic Equations

- 6.5.1 Application to Number Problems
- 6.5.2 Application to Geometry

7. Rational Expressions

7.1 Evaluating Rational Expressions

- 7.1.1 Identify, where a Rational Expression is not ...
- 7.1.2 Evaluate Rational Expressions

7.2 Simplifying Rational Expressions

- 7.2.1 Fundamental Property of Rational Expressions
- 7.2.2 Write Rational Expressions in Lowest Terms

7.3 Multiplying and Dividing Rational Expressions

- 7.3.1 Multiply Rational Expressions
- 7.3.2 Divide Rational Expressions

7.4 Least Common Denominator of Rational Expression

- 7.4.1 Least Common Denominator (LCD) of Rational Expressions
- 7.4.2 Rewrite a Rational Expression with a given New Denominator

7.5 Adding and Subtracting Rational Expressions

- 7.5.1 Add Rational Expressions with Like Denominators
- 7.5.2 Add Rational Expressions with unlike Denominators
- 7.5.3 Subtract Rational Expressions

7.6 Complex Fractions

- 7.6.1 Simplify complex fractions using two different Methods

7.7 Equations with Rational Expressions

- 7.7.1 Solve Equations containing Rational Expressions
- 7.7.2 Solve an Equation for one unknown in terms of the other

7.8 Applications

- 7.8.1 Applications: Involving Rational Equations: Numbers
- 7.8.2 Applications: Involving Rational Equations: Distance
- 7.8.3 Applications: Involving Rational Equations: Variations

8. Roots and Radicals

8.1 Finding Roots

- 8.1.1 Find Roots
- 8.1.2 Identify Root as a Rational Number, Irrationa...
- 8.1.3 Decimal Approximations for Irrational Square Roots and Cube Roots
- 8.1.4 Pythagorean Theorem

8.2 Multiplication and Division of Radicals

- 8.2.1 Multiply Radicals
- 8.2.2 Simplify Radicals with the Product Rule
- 8.2.3 Simplify Quotients of Radicals with the Quotient Rule

8.3 Addition and Subtraction of Radicals

- 8.3.1 Add and Subtract Like Radicals
- 8.3.2 Simplify Radical Sums and Differences

8.4 Rationalizing the Denominators

- 8.4.1 Rationalize Denominators with one Term
- 8.4.2 Write Radicals in Simplified Form
- 8.4.3 Rationalize Denominators involving Two Terms

8.5 Fractional Exponents

- 8.5.1 Simplify Expressions with exponents of the type $(1/n)$
- 8.5.2 Simplify Expressions with exponents of the type (m/n)

8.6 Equations with Radicals

- 8.6.1 Solve Equations with Radicals : Simple

9. Quadratic Equations

9.1 Square Root Property

9.1.1 Solve Equations of the form $x^2=k$ and $(ax + b)^2=k$, k positiv...

9.2 Completing the Square

9.2.1 Identify a term for making $x^2 + bx$ a Perfect Square

9.2.2 Solve $x^2 + bx + c = 0$ by Completing Square

9.2.3 Solve $ax^2 + bx + c = 0$ by Completing Square

9.3 The Quadratic formula

9.3.1 The Quadratic formula

9.3.2 Using the Quadratic formula for Solving Quadratic Equations

9.3.3 Applications

9.4 Solving By Graphing

9.4.1 Graphing a Quadratic Equation

9.4.2 Finding the Vertex of a Parabola

9.4.3 Approximating Real Solutions of a Quadratic Equation Graphically

10. Relations and Functions

10.1 Relations and Functions

10.1.1 Introduction to Relations

10.1.2 Introduction to Functions

10.1.3 Graph of a Function