

Knowre Math: **Algebra 2** Curriculum

Chapter 1 Solving Linear Equations and Inequalities

Lesson	Topic
1-1 Solving Linear Equations	A) Solving Multi-Step Equations
	B) Solving Equations with Rational Coefficients
	C) Solving Proportions
1-2 Solving Literal Equations	A) Solving One-Step and Two-Step Literal Equations
	B) Solving Multi-Step Literal Equations
1-3 Solving Absolute Value Equations	A) Solving Absolute Value Equations with Single Variable Inside Absolute Value
	B) Solving Absolute Value Equations with Linear Expression Inside Absolute Value
	C) Solving Absolute Value Equations with Variables on Both Sides
1-4 Solving Linear Inequalities	A) Solving One-Step and Two-Step Linear Inequalities
	B) Solving Multi-Step Linear Inequalities
	C) Graphing the Solution of Linear Inequalities
1-5 Solving Compound Inequalities	A) Graphing Compound Inequalities
	B) Solving Compound Inequalities
1-6 Solving Absolute Value Inequalities	A) Absolute Value Inequalities with Absolute Value Isolated
	B) Solving Multi-Step Absolute Value Inequalities
	C) Solving Absolute Value Inequalities with Variables on Both Sides

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Chapter 2 Linear Functions and Inequalities

Lesson	Topic
2-1 Interval Notation	A) Writing Interval Notation Given Graphs or Inequalities
	B) Using Interval Notation to Graph
2-2 Functions	A) Identifying Functions
	B) Domain and Range of Discrete Functions
	C) Domain and Range of Continuous Functions
2-3 Function Notation	A) Writing Function Notation
	B) Input and Output in Function Notation
	C) Evaluating and Solving Equations Written with Function Notation
2-4 Linear Functions	A) Graphing Linear Functions
	B) Writing Equations of Linear Functions
2-5 Parallel and Perpendicular Lines	A) Parallel Lines
	B) Perpendicular Lines
2-6 Piecewise Functions	A) Equations and Graphs of Piecewise Functions
	B) Evaluating Floor and Ceiling Functions
	C) Equations and Graphs of Floor and Ceiling Functions
2-7 Transformations of Absolute Value Functions	A) Graphing the Absolute Value Parent Function
	B) Absolute Value Functions and Translations
	C) Absolute Value Functions and Reflections
	D) Absolute Value Functions and Dilations
	E) Absolute Value Functions and Transformations
	F) Writing Equations of Transformed Absolute Value Functions
2-8 Linear Inequalities	A) Solutions of Two-Variable Inequalities
	B) Graphing Linear Inequalities
	C) Writing Equations of Linear Inequalities

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Chapter 3 Systems of Equations and Inequalities

Lesson	Topic
3-1 Systems of Equations with Two Variables	A) Solutions of Systems of Linear Equations
	B) Solving Systems of Linear Equations
3-2 Systems of Inequalities	A) Solutions of Systems of Linear Inequalities
	B) Graphing Systems of Linear Inequalities
	C) Writing Systems of Linear Inequalities
3-3 Linear Programming	A) Feasible Regions in Linear Programming
	B) Maximum and Minimum Values of Objective Functions
3-4 Substitution to Solve Systems of Equations with Three Variables	A) Solutions of Systems of Linear Equations with Three Variables
	B) Substitution to Solve Systems of Linear Equations with Three Variables Given Values
	C) Substitution to Solve Systems of Linear Equations with Three Variables
3-5 Elimination to Solve Systems of Equations with Three Variables	A) Writing Three-Variable Equations with Two Variables
	B) Elimination to Solve Systems of Linear Equations with Three Variables

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Chapter 4 Exponents and Roots

Lesson	Topic
4-1 Exponent Properties	A) Simplifying Zero and Negative Powers
	B) Product of Powers Property of Exponents
	C) Quotient of Powers Property of Exponents
	D) Power Property of Exponents
4-2 Combining Exponent Properties	A) Product and Quotient of Powers Properties to Multiply and Divide
	B) Combining Power of a Product, Power of a Quotient, and Power of a Power
4-3 Simplifying Square Roots	A) Simplifying Square Root Expressions with Natural Radicands
	B) Simplifying Square Roots with Variable Powers in the Radicand
	C) Simplifying Square Roots with Variable Expressions in the Radicand
4-4 Operations with Square Roots	A) Adding and Subtracting Square Roots
	B) Products of Square Roots
	C) Quotients of Square Roots
	D) Rationalizing Radical Expressions
4-5 Rational Exponents and nth Roots	A) Writing nth Roots as Rational Exponents
	B) Writing Rational Exponents as nth Roots
	C) Evaluating Powers with Rational Exponents
4-6 nth Roots of Integers	A) Simplifying nth Roots of Prime Factorized Numbers with Single Bases
	B) Simplifying nth Roots of Products of Prime Factors
	C) Simplifying nth Roots of Integers
4-7 nth Roots of Variable Expressions	A) Simplifying nth Roots of nth Powers
	B) Simplifying Odd nth Roots of Single Variables
	C) Simplifying Even nth Roots of Single Variables
	D) Simplifying nth Roots of Variable Expressions

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Chapter 5 Polynomial Operations and Complex Numbers

Lesson	Topic
5-1 Adding, Subtracting, and Multiplying Polynomials	A) Adding and Subtracting Polynomials
	B) Using the Distributive Property to Multiply Polynomials
	C) Special Products of Polynomials
	D) Product of Multiple Polynomials
5-2 Factoring Quadratics	A) Factoring Quadratics Whose Leading Coefficient is One
	B) Factoring Quadratics Whose Leading Coefficient is Greater Than One
	C) Factoring Quadratics Whose Leading Coefficient is Negative
	D) Factoring Quadratics After Factoring Out the GCF
5-3 Factoring Special Cases	A) Difference of Two Perfect Squares
	B) Perfect Square Trinomials
	C) Sum of Difference of Perfect Cubes
	D) Factoring Special Case Polynomials
5-4 Factoring Higher Degree Polynomials	A) Using Exponent Properties to Factor Higher Degree Polynomials
	B) Using Grouping to Factor Higher Degree Polynomials
	C) Factoring Trinomials of Degree Three or Greater
	D) Factoring Higher Degree Polynomials After Factoring Out the GCF or -1
5-5 Polynomial Long Division	A) Long Division of Polynomials with No Remainders
	B) Long Division of Polynomials with Remainders
5-6 Synthetic Division	A) Setting Up Synthetic Division
	B) Different Parts of Synthetic Division
	C) Synthetic Division of Polynomials
5-7 Introductions to Imaginary Numbers	A) Simplifying Powers of the Imaginary Unit
	B) Multiplying Expressions with Imaginary Units
	C) Simplifying Square Root Expressions with Negative Radicands

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Chapter 5 Polynomial Operations and Complex Numbers (cont.)

Lesson	Topic
5-8 Operations with Complex Numbers	A) Parts of Complex Numbers
	B) Adding and Subtracting Complex Numbers
	C) Multiplying and Simplifying Expressions with Complex Numbers
5-9 Conjugates	A) Irrational and Complex Conjugates
	B) Rationalizing Using Irrational Conjugates
	C) Rationalizing Using Complex Conjugates

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Chapter 6 Quadratic Functions and Equations

Lesson	Topic
6-1 Transformations of Quadratic Functions	A) Graphing the Quadratic Parent Functions
	B) Quadratic Functions and Translations
	C) Quadratic Functions and Reflections
	D) Quadratic Functions and Dilations
	E) Quadratic Functions and Transformations
	F) Writing Equations of Transformed Quadratic Functions
6-2 Standard Form of Quadratic Functions	A) Standard Form of Quadratic Functions
	B) Features of Quadratic Graphs
	C) Features of Quadratic Equations
	D) Domain and Range of Quadratic Functions
6-3 Vertex Form of Quadratic Functions	A) Writing the Vertex Form of Quadratic Functions
	B) Features of Quadratic Equations in Vertex Form
	C) Writing Equations of Quadratic Functions in Vertex Form
6-4 Solving Quadratics by Graphing or Factoring	A) Solutions and x-Intercepts of Quadratic Functions
	B) Graphing to Solve Quadratic Equations
	C) Factoring to Solve Quadratic Equations
6-5 Solving Quadratics by Completing the Square	A) Quadratic Equations with Complex Solutions
	B) Completing the Square to Solve Quadratic Equations
6-6 The Quadratic Formula	A) Writing the Quadratic Formula
	B) Solving Quadratic Equations with Real Solutions
	C) Solving Quadratic Equations with Complex Solutions
6-7 Discriminants of Quadratic Equations	A) Finding Discriminants
	B) Solutions of Quadratic Equations and Discriminants
	C) Number of Solutions and x-Intercepts
6-8 Quadratic Inequalities	A) Solutions of Quadratic Inequalities
	B) Solving Quadratic Inequalities
	C) Graphing Quadratic Inequalities

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Chapter 7 Polynomial Functions and Equations

Lesson	Topic
7-1 Factored Form	A) Zeros of Polynomial Functions in Factored Form
	B) Writing the Equations of Polynomial Functions Given Zeros or Roots
	C) Writing the Equations of Polynomial Functions in Factored Form
7-2 Roots of Polynomial Equations	A) Solutions of Polynomial Equations in Factored Form
	B) Multiplicity of Roots
	C) Number of Complex Roots
	D) Complex and Irrational Roots of Polynomial Equations
7-3 Polynomials with Real and Complex Zeros	A) Writing the Factor Given a Root of a Polynomial
	B) Roots and Factored Form of a Polynomial
7-4 Roots and the Remainder Theorem	A) Synthetic Division and Factoring
	B) Polynomial Function and the Remainder Theorem
7-5 End Behavior	A) Classifying Polynomial Graphs
	B) Graphs of Even and Odd Degree Functions
	C) Graphs and End Behavior
7-6 Graphs of Polynomial Functions	A) Real Roots of Polynomial Equations
	B) Degree of Polynomial Function and Multiplicity
	C) Degree of Polynomial Function Given Graph
	D) Domain and Range of Polynomial Functions

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Chapter 8 Radical Functions and Equations

Lesson	Topic
8-1 Operations of Functions	A) Function Notation
	B) Operations of Functions Using Coordinate Pairs or Tables
	C) Operations of Functions Using Graphs
	D) Operations of Functions Using Equations
	E) Domain of a Polynomial Sum, Difference, or Product
8-2 Composition of Functions	A) Equivalent Composition Functions
	B) Evaluating Composition of Functions
	C) Input and Output of Composition of Functions
	D) Domain of Composition of Functions
8-3 Inverse Relations and Functions	A) Inverse of a Relation
	B) Graphs of Functions and Their Inverses
	C) Function Notation and Inverses
	D) Finding Inverse Functions
8-4 Transformations of Square Root Functions	A) Graphing the Square Root Parent Function
	B) Square Root Functions and Translations
	C) Square Root Functions and Reflections
	D) Square Root Functions and Dilations
	E) Square Root Functions and Transformations
	F) Writing Equations of Transformed Square Root Functions
8-5 Domain and Range of Radical Functions	A) Domain of Square Root Functions
	B) Range of Square Root Functions
	C) Domain and Range of Cube Root Functions
	D) Domain and Range of Radical Functions
8-6 Solving Radical Equations	A) Solving Radical Equations with Variable on One Side
	B) Solving Radical Equations with Variable on Both Sides

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Chapter 8 Radical Functions and Equations (cont.)

Lesson	Topic
8-7 Solving Equations with Rational Exponents	A) Solving Equations with Rational Exponents - Variable on One Side
	B) Solving Equations with Rational Exponents - Variable on Both Sides

Chapter 9 Exponential Functions and Equations

Lesson	Topic
9-1 Solving Exponential Equations	A) Using Equivalent Bases to Solve Exponential Equations
	B) Solving Exponential Equations After Isolating
	C) Using Equivalent Bases and Negative Exponents to Solve Exponential Equations
9-2 Exponential Functions	A) Equations and Graphs of Exponential Functions
	B) Asymptotes
	C) Domain and Range of Exponential Functions
	D) Graphing Exponential Functions
9-3 Transformations of Exponential Functions	A) Exponential Functions and Translations
	B) Exponential Functions and Reflections
	C) Exponential Functions and Dilations
	D) Exponential Functions and Transformations
	E) Writing Equations of Transformed Exponential Functions
9-4 Exponential Growth and Decay	A) Classifying Graphs and Equations as Exponential Growth or Decay
	B) Equations of Exponential Growth or Decay
	C) Writing and Evaluating Exponential Growth and Decay Equations

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Chapter 10 Logarithms

Lesson	Topic
10-1 Introduction to Logarithms	A) Parts of a Logarithmic Expression or Equation
	B) Logarithms and Exponential Equations
	C) Common Logarithm
	D) Evaluating Logarithms with a Calculator
10-2 Evaluating Logarithms	A) Evaluating a Logarithm Without Rewriting the Argument or Base
	B) Evaluating a Logarithm After Rewriting the Argument or Base
10-3 Product and Quotient Properties of Logarithms	A) Product Property of Logarithms
	B) Quotient Property of Logarithms
	C) Using the Product or Quotient Property of Logarithms to Approximate
10-4 Power Property and Change of Base Formula	A) Power Property of Logarithms
	B) Change of Base Formula
	C) Using the Power Property of Logarithms to Approximate
10-5 Solving Basic Logarithmic Equations	A) Using the Property of Equality to Solve Logarithmic Equations
	B) Solving Logarithmic Equations with Linear Expression in Base or Argument
	C) Solving Logarithmic Equations After Isolating
	D) Solving Logarithmic Equations with Logarithm in Base or Argument
10-6 Solving Logarithmic Equations with Properties	A) Product or Quotient Properties to Solve Logarithmic Equations
	B) Power, Product, and Quotient Properties to Solve Logarithmic Equations
	C) Change of Base Formula to Solve Exponential Equations
10-7 Logarithmic Functions	A) Identifying Graphs and Equations of Logarithmic Functions
	B) Domain and Range of Logarithmic Functions
	C) Graphing Logarithmic Functions

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Chapter 10 Logarithms (cont.)

Lesson	Topic
10-8 Transformations of Logarithmic Functions	A) Logarithmic Functions and Translations
	B) Logarithmic Functions and Reflections
	C) Logarithmic Functions and Dilations
	D) Logarithmic Functions and Transformations
	E) Writing Equations of Transformed Logarithmic Functions
10-9 Natural Logarithms	A) Parts of Natural Logarithm
	B) Evaluating Natural Logarithmic Expressions
	C) Solving Natural Logarithmic Equations
	D) Graphs of Natural Logarithmic Functions

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Chapter 11 Sequences and Series

Lesson	Topic
11-1 Sequences	A) Terms of a Sequence
	B) Introduction to Arithmetic Sequence
	C) Introduction to Geometric Sequence
	D) Classifying Sequences
11-2 Arithmetic Sequences	A) Recursive Formula of an Arithmetic Sequence
	B) Writing and Evaluating Explicit Formula of an Arithmetic Sequence
	C) Recursive and Explicit Formulas of an Arithmetic Sequence
11-3 Geometric Sequences	A) Recursive Formula of a Geometric Sequence
	B) Writing and Evaluating Explicit Formula of a Geometric Sequence
	C) Recursive and Explicit Formulas of a Geometric Sequence
11-4 Series and Sigma Notation	A) Sequence and Series
	B) Parts of Sigma Notation
	C) Series and Sigma Notation
11-5 Arithmetic Series	A) Finite Series of an Arithmetic Sequence
	B) Writing and Finding the Partial Sum of Arithmetic Sequence or Series
	C) Finite Arithmetic Series Written in Sigma Notation
11-6 Finite Geometric Series	A) Finite Series of a Geometric Sequence
	B) Writing and Finding the Partial Sum of Geometric Sequence or Series
	C) Finite Geometric Series Written in Sigma Notation
11-7 Infinite Geometric Series	A) Convergent and Divergent Series
	B) Writing and Evaluating an Infinite Geometric Series
	C) Infinite Geometric Series and Sigma Notation

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Chapter 12 Rational Functions and Equations

Lesson	Topic
12-1 Direct and Inverse Variation	A) Direct Variation
	B) Inverse Variation
12-2 Transformations of Rational Functions	A) Graphing the Rational Parent Function
	B) Rational Functions and Translations
	C) Rational Functions and Reflections
	D) Rational Functions and Dilations
	E) Rational Functions and Transformations
	F) Writing Equations of Transformed Rational Functions
12-3 Simplifying Rational Expressions	A) Simplifying Factored Rational Expressions
	B) Simplifying Rational Expressions After Factoring
12-4 Multiplying and Dividing Rational Expressions	A) Cross Canceling
	B) Simplifying a Product of Rational Expressions
	C) Simplifying a Quotient of Rational Expressions
12-5 Adding and Subtracting Rational Expressions	A) Adding and Subtracting Rational Expressions with Same Denominator
	B) Least Common Denominator of Rational Expressions
	C) Adding and Subtracting Rational Expressions with Different Denominators
12-6 Solving Rational Equations	A) Solving Factored Rational Equations
	B) Solving Rational Equations After Factoring
12-7 Discontinuities in Rational Functions	A) Identifying Equations of Rational Functions
	B) Holes and Points of Discontinuity
	C) Equations of Vertical Asymptotes
	D) Identifying Holes and Vertical Asymptotes
12-8 Graphs of Rational Functions	A) Holes, Vertical Asymptotes, and Horizontal Asymptotes
	B) Graphing and Identifying Graphs of Rational Functions
	C) Writing and Identifying Equations of Rational Functions

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Chapter 13 Trigonometry

Lesson	Topic
13-1 Special Right Triangles	A) Side Lengths of 45° - 45° - 90° Triangles
	B) Side Lengths of 30° - 60° - 90° Triangles
	C) Using Side Lengths to Find Angle Measures
13-2 Trigonometric Ratios	A) Using Side Lengths of a Triangle to Write Trigonometric Ratios
	B) Trigonometric Ratios of 30° , 45° , and 60° Angles
	C) Trigonometric Ratios and Angle Measures
	D) Solving Trigonometric Equations
13-3 Angles of Rotation	A) Degrees and Radians
	B) Angles on a Coordinate Plane
	C) Locating Angle Measures on a Coordinate Plane
	D) Drawing Angles on a Coordinate Plane
13-4 Coterminal and Reference Angles	A) Coterminal Angles
	B) Reference Angles
13-5 Trigonometric Functions of All Angles	A) Using the Coordinates of a Point to Find Trigonometric Ratios
	B) Using Reference Angles of 30° , 45° , and 60° to Find Trigonometric Ratios
13-6 The Unit Circle	A) Parts of a Unit Circle
	B) Completing the Unit Circle
	C) Using a Unit Circle to Find Trigonometric Ratios
13-7 Periodic Functions	A) Graphs and Features of Periodic Functions
	B) Graphing Periodic Functions
13-8 Sine and Cosine Functions	A) Amplitudes of Sine and Cosine Functions
	B) Reflections of Sine and Cosine Functions
	C) Periods of Sine and Cosine Functions
	D) Writing the Equations of Sine and Cosine Functions
	E) Graphing Sine and Cosine Functions

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Chapter 13 Trigonometry (Cont.)

Lesson	Topic
13-9 Tangent Functions	A) Tangent Parent Function
	B) Vertical Dilations and Reflections of Tangent Functions
	C) Periods of Tangent Functions
	D) Asymptotes of Tangent Functions
	E) Writing the Equation of Tangent Functions
	F) Graphing Tangent Functions
13-10 Translations of Trigonometric Functions	A) Graphs and Equations of Translated Trigonometric Functions
	B) Domain and Range of Trigonometric Functions
13-11 Trigonometric Identities	A) The Tangent Identity
	B) The Pythagorean Identity
	C) The Reciprocal Identity

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Chapter 14 Probability

Lesson	Topic
14-1 Factorials and Outcomes	A) Factorials and Operations with Factorials
	B) Tree Diagrams
	C) Number of Outcomes for Independent and Dependent Events
14-2 Permutations and Combinations	A) Permutations
	B) Combinations
	C) Permutation and Combination from Situations
14-3 Experimental and Theoretical Probability	A) Experimental Probability
	B) Theoretical Probability
	C) Making Inferences Using Probability
14-4 Mutually Exclusive Events	A) Probability of an And Event
	B) Probability of Mutually Exclusive Events
	C) Probability of Not Mutually Exclusive Events
14-5 Independent Events	A) Independent and Dependent Events
	B) Tree Diagrams and Probability of Independent Events
	C) Compound Probability of Independent Events
14-6 Dependent Events	A) Tree Diagrams and Probability of Dependent Events
	B) Conditional Probability
	C) Probability of Dependent Events
14-7 Two-Way Tables	A) Two-Way Tables and Probability
	B) Relative Frequency and Probability
	C) Relative Frequency and Conditional Probability

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Chapter 15 Statistics

Lesson	Topic
15-1 Measures of Center and Spread	A) Measures of Center of a Data Set
	B) Measures of Spread of a Data Set
	C) Shape of a Data Set
15-2 Standard Deviation	A) Standard Deviation of a Data Set
	B) Shape of a Data Set and Standard Deviation
15-3 Populations, Samples, and Bias	A) Population, Sample, Parameter, and Statistic
	B) Survey, Experiment, or Observational Study
	C) Types of Samples
	D) Supporting Predictions and Conclusions
	E) Designing a Study
15-4 Binomial Theorem	A) Pascal's Triangle and Binomial Expansion
	B) Combination and Binomial Expansion
	C) Binomial Theorem
15-5 Binomial Probability	A) Binomial Experiment
	B) Finding Binomial Probability
	C) Binomial Expressions and Distribution Graphs
15-6 Normal Distribution	A) Normal Distribution Graphs
	B) Normal Distribution Graphs and the Empirical Rule
15-7 z-Scores	A) Standard Normal Distribution and z-Scores
	B) Probability Using z-Tables