

# Knowre Math: **Algebra 2** Curriculum

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## Chapter 1 Introduction to Algebra 2

Lesson	Topic
1-1 Real Numbers and Order of Operations	A) Number Sets
	B) Absolute Value
	C) Order of Operations
1-2 Expressions	A) Writing Algebraic Expressions
1-3 Equations	A) Solving Linear Equations
	B) Solving Literal Equations
	C) Solving Absolute Value Equations
1-4 Inequalities	A) Graphing Linear Inequalities
	B) Solving Linear Inequalities
1-5 Compound Inequalities	A) Writing and Graphing Compound Inequalities
	B) Solving Compound Inequalities
1-6 Absolute Value Inequalities	A) Writing and Graphing Absolute Value inequalities
	B) Solving Absolute Value Inequalities
1-7 The Coordinate Plane	A) Features of the Coordinate Plane
	B) Scale, Maximum, and Minimum of Coordinate Planes

## Chapter 2 Properties and Attributes of Functions

Lesson	Topic
2-1 Relations	A) Relations and their Representations
	B) Domain and Range of Relations
2-2 Introduction to Functions	A) Identifying Functions
	B) Domain and Range of Functions
	C) Identifying Independent and Dependent Variables
2-3 Interval Notation	A) Inequalities and Interval Notation
	B) Graphing Intervals on a Number Line
	C) Domain and Range of Continuous Functions
2-4 Function Notation	A) Identifying Inputs and Outputs of Functions
	B) Writing Equations Using Function Notation
	C) Evaluating Functions

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## Chapter 3 Linear Functions

Lesson	Topic
3-1 Linear Equations and Functions	A) Identifying Linear Functions and Equations in Standard Form
	B) Identifying the x- and y-intercepts
	C) Graphing Linear Functions
3-2 Rate of Change and Slope	A) Define Rate of Change
	B) Finding Rate of Change and Slope
3-3 Slope-Intercept Form	A) Define Slope-Intercept Form
	B) Graphing Equations in Slope-Intercept Form
	C) Writing Equations in Slope-Intercept Form
3-4 Point-Slope Form	A) Define Point-Slope Form
	B) Graphing Equations in Point-Slope Form
	C) Writing Equations in Point-Slope Form
3-5 Special Lines	A) Horizontal and Vertical Lines
	B) Parallel and Perpendicular Lines
3-6 Linear Inequalities	A) Graphing Linear Inequalities

## Chapter 4 Linear Systems

Lesson	Topic
4-1 Solving by Graphing	A) Solutions of Systems of Equations
	B) Solving Systems by Graphing
4-2 Solving by Substitution	A) Solving Systems with Substitution
4-3 Solving by Elimination	A) Directly Eliminating x or y
	B) Elimination After Scalar Multiplication
4-4 Systems of Inequalities	A) Solving Systems of Linear Inequalities
4-5 Linear Programming	A) Defining the Feasible Region
	B) Maximizing/Minimizing Using the Feasible Region
4-6 System of Equations with Three Variables	A) Solving with Substitution

## Chapter 5 Exponents and Roots

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Lesson	Topic
5-1 Multiplication and Division Properties of Exponents	A) Product of Powers Property
	B) Quotient of Powers Property
	C) Negative Exponents
5-2 Power Properties of Exponents	A) Power of a Power Property
	B) Power of a Product Property
5-3 Simplifying Radicals	A) Simplifying Square Roots
	B) Square Roots of Variable Expressions
5-4 Adding and Subtracting Radicals	A) Adding and Subtracting Square Roots
5-5 Multiplying and Dividing Radicals	A) Simplifying Products of Square Roots
	B) Simplifying Quotients of Square Roots
5-6 Rationalizing Radicals	A) Simplifying Square Roots by Rationalizing the Denominator
5-7 Rational and nth Root Forms	A) Writing Rational Exponents in Radical Form
	B) Writing Radical Expressions in Rational Exponent Form
5-8 Evaluating nth Roots and Rational Exponents	A) Simplifying nth Roots
	B) Writing Rational Exponents in Simplified Radical Form
5-9 Simplifying nth Roots of Variable Expressions	A) Simplifying nth Roots of Variable Expressions

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## Chapter 6 Transformations of Parent Functions

<b>Lesson</b>	<b>Topic</b>
6-1 Parent Functions	A) Graphing Parent Functions
	B) Equations of Parent Functions
6-2 Translations	A) Identifying Translations
	B) Graphing Translations of Parent Functions
	C) Writing Equations of Translated Parent Functions
6-3 Reflections	A) Identifying Reflections
	B) Graphing Reflections of Parent Functions
	C) Writing Equations of Reflected Parent Functions
6-4 Dilations	A) Identifying Dilations
	B) Graphing Dilations of Parent Functions
	C) Writing Equations of Dilated Parent Functions
6-5 Mixed Transformations	A) Identifying Transformations
	B) Graphing Transformations of Parent Functions
	C) Writing Equations of Transformed Parent Functions
6-6 Transformations on Function Notation	A) Writing Equations of Functions after Transformations
	B) Identifying the Transformation that Results when Terms are Replaced in Function Notation
6-7 Piecewise-Defined Functions	A) Features of Piecewise Functions
	B) Graphing Functions on Intervals
	C) Graphing Piecewise Functions

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## Chapter 7 Polynomials

Lesson	Topic
7-1 Introduction to Polynomials	A) Classifying Polynomials
	B) Standard Form
7-2 Adding, Subtracting, and Multiplying Polynomials	A) Addition of Polynomials
	B) Subtraction of Polynomials
	C) Multiplication of Polynomials
7-3 Factoring	A) Factoring a GCF
	B) Factoring by Grouping
	C) Factoring Trinomials
7-4 Factoring - Special Cases	A) Factoring Perfect Square Trinomials
	B) Factoring a Difference of Squares
	C) Factoring a Sum or Difference of Cubes
7-5 Imaginary Unit $i$	A) Defining $i$
	B) Powers of $i$
	C) Simplifying Expressions that Contain Imaginary Numbers
7-6 Complex Numbers	A) Defining Complex Numbers
	B) Operations with Complex Numbers
	C) Conjugates of Complex Numbers

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## Chapter 8 Quadratic Functions

Lesson	Topic
8-1 Parabolas	A) Graphs of Quadratic Functions
	B) Features of Parabolas
	C) Using the Vertex and the Intercepts to Graph Quadratic Functions
8-2 Standard Form of Quadratic Functions	A) Standard Form of a Quadratic Function
	B) Using Key Features to Graph a Quadratic Functions in Standard Form
	C) Writing Quadratic Equations in Standard Form
8-3 Solving Quadratic Equations by Graphing	A) Solutions and x-intercepts
8-4 Solving Quadratic Equations by Factoring	A) The Zero Product Property
	B) Solving Quadratic Equations by Factoring
	C) Writing Quadratic Functions in Factored Form
8-5 Solving Quadratic Equations by Completing the Square	A) Using Square Roots to Solve Quadratic Equations
	B) Solving Quadratic Equations by Completing the Square
	C) Graphing Quadratic Functions in Vertex Form
	D) Writing Quadratic Functions in Vertex Form
8-6 Solving Quadratic Equations Using the Quadratic Formula	A) Using the Quadratic Formula to Solve Quadratic Equations
	B) Solutions and the Discriminant
	C) Using the Quadratic Formula to Write Quadratic Equations in Factored Form

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## Chapter 9 Polynomial Functions

<b>Lesson</b>	<b>Topic</b>
9-1 Dividing Polynomials Using Long Division	A) Polynomial Long Division
9-2 Dividing Polynomials Using Synthetic Division	A) Polynomial Synthetic Division
9-3 Polynomial Equations	A) Solutions of Polynomial Equations
	B) Writing Polynomial Functions given the Zeros
	C) Finding all Roots of Polynomial Functions
9-4 Graphs of Polynomial Functions	A) Classifying Functions Based on their Graphs
	B) End Behavior
	C) Relating Graphs of Polynomial Functions to their Equations

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## Chapter 10 Radical Functions and Inverses

Lesson	Topic
10-1 nth Root Functions	A) Domain and Range of Square Root Functions
	B) Graphing Square Root Functions
	C) Domain and Range of nth Root Functions
10-2 Solving Radical Equations	A) Solving Square Root and nth Root Equations
10-3 Operations on Functions	A) Performing Operations on Functions
	B) Domain and Range of Functions that Result from Operations
10-4 Composition of Functions	A) Evaluating Compositions of Functions
	B) Writing Compositions of Functions
10-5 Inverse Functions and Relations	A) Inverses of Relations
	B) Determining the Inverse of Function Equations
	C) Composition and Inverse Functions



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## Chapter 11 Exponential and Logarithmic Functions

Lesson	Topic
11-1 Exponential Functions	A) Writing and Graphing Exponential Functions
	B) Domain and Range of Exponential Functions
11-2 Solving Exponential Equations	A) Solving Exponential Equations with a Common Base
	B) Solving Exponential Equations by Finding a Common Base
11-3 Evaluating Logarithms	A) Defining Logarithms
	B) Evaluating Logarithms
11-4 Solving Logarithmic Equations	A) Solving Logarithmic Equations
11-5 Logarithmic Functions	A) Domain and Range of Logarithmic Functions
	B) Inverses of Logarithmic and Exponential Functions
	C) Graphing Logarithmic Functions
11-6 Exponential Growth and Decay	A) Identifying Percent Change
	B) Writing Exponential Growth and Decay Equations
	C) Modeling Exponential Growth and Decay

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## Chapter 12 Sequences and Series

Lesson	Topic
12-1 Sequences	A) Common Ratio and Difference
	B) Writing Terms of Arithmetic and Geometric Sequences
	C) Sequences and their Graphs
12-2 Arithmetic Sequences	A) Recursive Formulas of Arithmetic Sequences
	B) Explicit Formulas of Arithmetic Sequences
12-3 Geometric Sequences	A) Recursive Formulas of Geometric Sequences
	B) Explicit Formulas of Geometric Sequences
12-4 Arithmetic Series	A) Defining Arithmetic Series
	B) Partial Sums of Arithmetic Series
12-5 Geometric Series	A) Defining Geometric Series
	B) Partial Sums of Geometric Series
	C) Infinite Geometric Series
12-6 Sigma Notation	A) Introduction to Sigma Notation
	B) Writing Series in Sigma Notation
	C) Evaluating Arithmetic and Geometric Series in Sigma Notation

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## Chapter 13 Rational Functions

Lesson	Topic
13-1 Simplifying Rational Expressions	A) Undefined Values of Rational Expressions
	B) Simplifying Rational Expressions
13-2 Multiplying and Dividing Rational Expressions	A) Multiplying Rational Expressions
	B) Dividing Rational Expressions
13-3 Adding and Subtracting Rational Expressions	A) Common Denominators of Rational Expressions
	B) Adding and Subtracting Rational Expressions
13-4 Reciprocal Functions	A) Defining Reciprocal Functions
	B) Domain and Range of Reciprocal Functions
	C) Graphing Reciprocal Functions
13-5 Rational Functions	A) Defining Rational Functions
	B) Asymptotes and Holes
	C) Graphing Rational Functions
13-6 Solving Rational Equations	A) Solving Rational Equations
13-7 Direct and Inverse Variation	A) Direct Variation
	B) Inverse Variation