Algebra 2

Syllabus

**UNIT I: Equations and Inequalities**

1. Apply Properties of Real Numbers
2. Evaluate and Simplify Algebraic Expressions
3. Solve Linear Equations
4. Rewrite Formulas and Equations
5. Use Problem Solving Strategies and Models
6. Solve Linear Inequalities
7. Solve Absolute Value Equations and Inequalities

**UNIT II: Linear Equations and Functions**

1. Represent Relations and Functions
2. Find Slope and Rate of Change
3. Graph Equations of Lines
4. Write Equations of Lines
5. Model Direct Variation
6. Draw Scatter Plots and Best-Fitting Lines
7. Use Absolute Value Functions and Transformations
8. Graph Linear Inequalities in Two Variables

**UNIT III: Linear Systems and Matrices**

1. Solve Linear Systems by Graphing
2. Solve Linear Systems Algebraically
3. Graph Systems of Linear Inequalities
4. Solve Systems of Linear Equations in Three Variables
5. Perform Basic Matrix Operations
6. Multiply Matrices
7. Evaluate Determinants and Apply Cramer’s Rule
8. Use Inverse Matrices to Solve Linear Systems

**UNIT IV: Quadratic Functions and Factoring**

1. Graph Quadratic Functions in Standard Form
2. Graph Quadratic Functions in Vertex or Intercept Form
3. Solve $x^{2}+bx+c=0$ by Factoring
4. Solve $ax^{2}+bx+c=0$ by Factoring
5. Solve Quadratic Equations by Finding Square Roots
6. Perform Operations with Complex Numbers
7. Complete the Square
8. Use the Quadratic Formula and the Discriminant
9. Graph and Solve Quadratic Inequalities
10. Write Quadratic Functions and Models

**UNIT V: Polynomials and Polynomial Functions**

1. Use Properties of Exponents
2. Evaluate and Graph Polynomial Functions
3. Add, Subtract, and Multiply Polynomials
4. Factor and Solve Polynomial Equations
5. Apply the Remainder and Factor Theorems
6. Find Rational Zeros
7. Apply the Fundamental Theorem of Algebra
8. Analyze Graphs of Polynomial Functions
9. Write Polynomial Functions and Models

**UNIT VI: Rational Exponents and Radical Functions**

1. Evaluate nth Roots and Use Rational Exponents
2. Apply Properties of Rational Exponents
3. Perform Function Operations and Composition
4. Use Inverse Functions
5. Graph Square Root and Cube Root Functions
6. Solve Radical Equations

**UNIT VII: Exponential and Logarithmic Functions**

1. Graph Exponential Growth Functions
2. Graph Exponential Decay Functions
3. Use Functions Involving e
4. Evaluate Logarithms and Graph Logarithmic Functions
5. Apply Properties of Logarithms
6. Solve Exponential and Logarithmic Equations
7. Write and Apply Exponential and Power Functions

**UNIT VIII: Rational Functions**

1. Model Inverse and Joint Variation
2. Graph Simple Rational Functions
3. Graph General Rational Functions
4. Multiply and Divide Rational Expressions
5. Add and Subtract Rational Expressions
6. Solve Rational Equations

**UNIT IX: Quadratic Relations and Conic Sections**

1. Apply the Distance and Midpoint Formulas
2. Graph and Write Equations of Parabolas
3. Graph and Write Equations of Circles
4. Graph and Write Equations of Ellipses
5. Graph and Write Equations of Hyperbolas
6. Translate and Classify Conic Sections
7. Solve Quadratic Systems