



Bentonville Schools

Course Name: *Algebra 2*

Last Revised: *Fall 2025*

Course Description: *Builds on their work with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms.*

Note: Students may enroll concurrently with Geometry.

Overview of Key Concepts and Essential Learning

Timeframe

Unit 1: Sequences, Functions, Matrices

6 Weeks

The student will use and write arithmetic sequences recursively and explicitly to model situations.
The student will use and write geometric sequences recursively and explicitly to model situations
The student will combine standard function types using arithmetic operations.
The student will compose functions.
The student will graph piecewise functions, with and without context, and identify key features.
The student will multiply a matrix by a scalar.
The student will add and subtract matrices.
The student will solve systems of linear equations in 3 variables using matrices.

Essential Standard: A2.FN.1, A2.PRF.12

Note: Not every standard and/or learning goal/target will be listed on this document.

Timeframe

Unit 2: Graphing Polynomial Functions

6 Weeks

The student will graph quadratic functions using various forms and identify key features.
The student will factor a quadratic expression.
The student will model using quadratic functions and quadratic inequalities.
The student will identify transformations of graphs of quadratic functions.
The student will calculate and interpret the average rate of change of a quadratic function.
The student will solve a system of equations consisting of a linear equation and a nonlinear equation.
The student will graph polynomial functions, with and without context, and identify key features.
The student will identify whether a function is even or odd.
The student will find zeros of the polynomial.
The student will calculate and interpret the average rate of change of polynomial functions represented in a table, graph, or as an equation in context of mathematical and real-world problems.

Essential Standards: A2.PRF.4, A2.PRF.12

Timeframe

Unit 3: Solving Polynomial Equations

4 Weeks

The student will factor a quadratic expression.
The student will solve quadratic functions by factoring, finding square roots, completing the square, and using the quadratic formula. Solutions will include complex numbers.
The student will perform arithmetic operations with square roots and complex numbers.

	The student will graph polynomial functions, with and without context, and identify key features. The student will identify whether a function is even or odd. The student will find zeros of the polynomial. The student will calculate and interpret the average rate of change of polynomial functions represented in a table, graph, or as an equation in context of mathematical and real-world problems. The student will factor and solve polynomial equations (inspection, long division, synthetic division with and without a remainder). The student will apply the Remainder Theorem and the Fundamental Theorem of Algebra. The student will use zeros and an understanding of multiplicity to sketch a graph of a polynomial function with a degree of 3 or higher. The student will solve non-linear formulas for a specified variable. Essential Standards: A2.RC.4, A2.QFE.2
Timeframe 2 Weeks	Unit 4: Graphing and Solving Radical Equations The student will solve radical equations and check for extraneous solutions. The student will graph square root and cube root functions and identify key features and transformations. Essential Standards: A2.PRF.6, A2.PRF.12
Timeframe 5 Weeks	Unit 5: Simplifying Radical Expressions The student will use properties of exponents. The student will write and graph the inverse of a function. The student will simplify radical expressions. The student will perform operations with radical expressions. Essential Standards: A2.RC.2, A2.FN.4
Timeframe 6 Weeks	Unit 6: Exponential and Logarithmic Functions The student will translate between logarithmic and exponential forms of an equation. The student will use properties of logarithms to simplify and evaluate logarithmic expressions. The student will write and solve logarithmic and exponential equations. The student will graph exponential and logarithmic functions with and without context, identifying key features, and determining constraints in a given context. The student will identify the transformations of logarithmic and exponential graphs. The student will calculate and interpret the average rate of change of an exponential function represented in a table, graph, or as an equation in the context of mathematical and real-world problems. Essential Standards: A2.ELF.2, A2.ELF.6, A2.ELF.7, A2.ELF.12, A2.ELF.14
Timeframe 3 Weeks	Unit 7: Graphing Rational Functions The student will rewrite simple rational expressions in different forms. The student will graph rational functions and identify key features including asymptotes. The student will generalize the effect of transformations on $1/x$. Essential Standards: A2.PRF.12, A2.PRF.14
Timeframe	Unit 8: Solving Rational Equations The student will solve rational equations.



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3 Weeks	The student will rewrite simple rational expressions in different forms. The student will perform arithmetic operations with rational functions. Essential Standards: A2.PRF.6, A2.PRF.19
Timeframe 1 Week	Unit 9: Statistics The student will use data from a random sample to make inferences about a population (scatter plots and regressions). The student will compare theoretical and empirical probabilities using simulations. The student will distinguish between sample surveys, experiments and observation studies. The student will explain the purpose of randomization in statistical studies. The student will explain the validity of data from outside reports. The student will identify type of data, data collection method, and potential biases. Essential Standards: None
Available Student Support for Learning: Refer to the teacher's Course Syllabus and Google Classroom for resources and course specific opportunities.	
Algebra 2 Arkansas State Standards Arkansas Math Standards 2023	