

Algebra 2

| State Standard Number | State Standard Area/Description | Unit Name | Course Topic Description |
|-----------------------|---|--------------------------|---|
| | Number and Operations | | |
| 1 | Determine the relationships among the subsets of complex numbers. | Complex Numbers | Absolute Value of a Complex Number Introduction The complex number i Working with complex numbers |
| 2 | Simplify expressions involving complex numbers, using order of operations and including conjugate and absolute value. | Complex Numbers | Working with complex numbers Addition and Subtraction in a Complex Plane Absolute Value of a Complex Number |
| | Algebra | | |
| 3 | Analyze families of functions, including shifts, reflections, and dilations of $y=k/x$ (inverse variation), $y=kx$ (direct variation/linear), $y=x^2$ (quadratic), $y=a$ to the x power (exponential), and $y=\log$ to base a of x (logarithmic). | | |
| 3.1 | Identifying the domain and range of a relation given its graph, a table of values, or its equation, including those with restricted domains | Composition of Functions | Domain Restrictions |
| 3.2 | Identifying real-world situations corresponding to families of functions | Composition of Functions | Definition of Functions |
| 4 | Determine approximate real zeros of functions graphically and numerically and exact real zeros of polynomial functions. | Quadratics | Zeros of the quadratic functions |
| 4.1 | Using completing the square, the zero product property, and the quadratic formula | Quadratics | Developing the Quadratic Formula Completing the Square The Quadratic Formula |
| 5 | Identify the characteristics of quadratic functions from their roots, graphs, or equations. | Quadratics | The Discriminant of a Quadratic |
| 5.1 | Writing an equation when given its roots or graph | Quadratics | From the zeros to the equation of quadratic functions |
| 5.2 | Graphing a function when given its equation | Quadratics | Quadratic functions and their graphs |
| 5.3 | Determining the nature of the solutions of a quadratic equation | Quadratics Quadratics | The Discriminant of a Quadratic The Quadratic Formula |
| 5.4 | Determining the maximum or minimum values of quadratic functions both graphically and algebraically | Quadratics | Graphing Parabolas Introduction |

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| | | | Factored form of quadratics |
| | | | Quadratic functions and their graphs |
| | | | From the zeros to the equation of quadratic functions |
| | | | Quadratic functions in the real world |
| 6 | Perform operations on functions, including addition, subtraction, multiplication, division, and composition. | Composition of Functions | Combining Functions |
| 6.1 | Determining the inverse of a function or a relation | Composition of Functions | Finding an Inverse Function |
| | | Conic Sections | Parabolas in Standard Form |
| | | Composition of Functions | Inverse functions |
| | | | Checking that two functions really are inverse functions of each other |
| 6.2 | Performing operations on polynomial and rational expressions containing variables | Polynomials | Combining polynomials |
| 6.3 | Constructing graphs by analyzing their functions as sums or differences | Composition of Functions | Horizontal Line Test |
| | | Composition of Functions | Domain Restrictions |
| 7 | Solve equations, inequalities, and applied problems involving absolute values, radicals, and quadratics over the complex numbers, as well as exponential and logarithmic functions. | Quadratics | Developing the Quadratic Formula |
| 7.1 | Solving equations using laws of exponents, including rational and irrational exponents | Exponential and Logarithmic Functions | Computations with exponential functions |
| 7.2 | Expressing the solution of an equation, inequality, or applied problem as a graph on a number line or by using set or interval notation | Absolute Value | Absolute Value and Inequalities |
| 8 | Solve systems of linear equations or inequalities in two variables using algebraic techniques, including those involving matrices. | Systems of Linear Equations | Using your calculator to solve systems of linear equations |
| 8.1 | Evaluating the determinant of a 2x2 or 3x3 matrix | | |
| 8.2 | Solving word problems involving real-life situations | Quadratics | Quadratic functions in the real world |
| | Geometry | | |
| 9 | Solve coordinate geometry problems using algebraic techniques. | Conic Sections | The Distance Formula |
| | Data Analysis and Probability | | |

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| 10 | Use different forms of representation to compare characteristics of data gathered from two populations. | Counting | Frequency Expectation Interpretation of probability |
| 10.1 | Evaluating the appropriateness of the design of an experimental study | | |
| 10.2 | Describing how sample statistics reflect values of population parameters | | |
| 11 | Determine an equation of linear regression from a set of data. | | |
| 11.1 | Examining data to determine if a linear or quadratic relationship exists and to predict outcomes | | |
| 12 | Calculate probabilities of events using the laws of probability. | Counting | Probability: An introduction |
| 12.1 | Using permutations and combinations to calculate probabilities | Counting | Counting: An introduction to choosing subsets |
| | | | Combinations |
| | | | Counting Subsets Formula |
| | | | Permutations |
| | Frequency Expectation Interpretation of probability | | |
| 12.2 | Calculating conditional probability | Counting | Probability: More examples |
| 12.3 | Calculating probabilities of mutually exclusive events, independent events, and dependent events | Counting | Frequency Expectation Interpretation of probability |