

## Algebra 2

Month	Content	Skills
August	<p><b>A. Tools of Algebra</b></p> <ol style="list-style-type: none"> <li>1. The Real Number System</li> <li>2. Properties of Real Numbers</li> <li>3. Order of Operations</li> <li>4. Combining Like Terms</li> <li>5. Solving Equations</li> <li>6. Solving formulas</li> <li>7. Solving Inequalities</li> </ol>	<p><b>A. Tools of Algebra</b></p> <p>A1. Determine the real number system a number is in and comparing numbers within a system.</p> <p>A2. Be able to use the Properties of Real Numbers to solve problems:  Commutative  Associative  Identity  Inverse  Distributive  Multiplication Property of Zero  Multiplication Property of -1  Absolute Value</p> <p>A3. Use Order of Operations (with exponents) to evaluate and use formulas</p> <p>A4. Use combining like terms to simplify an expression.</p> <p>A5. Solve multi-step equations:  Combining Like Terms  Distributive Property  Variables on both sides.</p> <p>A6. Solve a formula for one of its variables.</p> <p>A7. Solve multi-step Inequalities and graph the solutions on a real number line.</p>

Month	Content	Skills
September	<p data-bbox="489 1114 848 1141"><b>A. Tools of Algebra (continued)</b></p> <p data-bbox="489 1174 926 1230">8. Solving Absolute Value equations and inequalities</p> <p data-bbox="489 1263 636 1291">9. Probability</p>	<p data-bbox="1062 1114 1421 1141"><b>A. Tools of Algebra (continued)</b></p> <p data-bbox="1062 1174 1619 1201">A8. Solve absolute value equations and inequalities.</p> <p data-bbox="1062 1234 1835 1291">A9. Find basic probabilities and know the difference between finding an experimental and a theoretical probability.</p> <p data-bbox="1062 1417 1814 1445"><b>B. Relations and Functions, Linear Functions, and Absolute Value</b></p>

Month	Content	Skills
	<p><b>B. Relations and Functions, Linear Functions, and Absolute Value Functions.</b></p> <p>1. Relations, Domain and Range</p> <p>2. Functions</p> <p>3. Function Notation</p> <p>4. Linear Functions</p>	<p><b>Functions.</b></p> <p>B1. Be able to find domains and ranges from ordered pairs, charts, or graphs. Write relations in the different forms.</p> <p>B2. Determine if a relation is a function. (vertical line test, etc).</p> <p>B3. Evaluate a function from function notation (Ex. Find <math>f(3)</math>.)</p> <p>B4.</p> <p>a. Find the slope of a line from a graph</p> <p>b. Find the slope of a line between 2 points</p> <p>c. Find x and y intercepts from a graph or equation.</p> <p>d. Graph linear functions using the slope-intercept form of a linear equation</p> <p>e. Graph linear equations from Standard Form</p> <p>f. Converting between forms of linear equations</p> <p>g. Writing equations of lines given a point and slope.</p> <p>h. Write the equation of a line given two points.</p> <p>i. Write the equation of a line parallel or perpendicular to a given line and passing through a point on the line</p> <p>j. Graph and write equations of horizontal and vertical lines</p> <p>B5. Write equations using direct variation and find the constant of variation.</p> <p>B6. Use linear models to represent data or to solve problems. (Lines of best fit-optional).</p> <p>B7.</p> <p>a. Graph Absolute Value functions by finding the two linear equations and the vertex.</p>



Month	Content	Skills
October	<p><b>C. Solving Linear Systems of Equations and Inequalities</b></p> <ol style="list-style-type: none"> <li>1. Systems of Linear Equations</li>   <li>2. Systems of Linear Inequalities</li>   <li>3. Systems of Linear equations of three variables.</li> </ol> <p><b>D. Matrices</b></p> <ol style="list-style-type: none"> <li>1. Properties of matrices</li> </ol>	<p><b>C. Solving Linear Systems of Equations and Inequalities</b></p> <p>C1. Solve Systems of Linear Equations by:        Graphing        Substitution        Elimination</p> <p>C2. Solve Systems of Linear Inequalities by graphing.</p> <p>C3. Solve systems of 3 Variables by:        Substitution        Elimination</p> <p><b>D. Matrices</b></p> <p>D1.</p> <ol style="list-style-type: none"> <li>a. Determine the Number of Rows and Columns, and name the elements in a matrix.</li>   <li>b. Use the Properties of Matrices to solve problems:          Closure          Commutative          Associative          Identity          Inverse          Distributive          Multiplication Property of Zero</li> </ol> <p>D2. Add, Subtract, Multiply by a Scalar, and Multiply matrices.</p>

Month	Content	Skills
<b>November</b>	<p>2. Operations on Matrices</p> <p><b>D. Matrices (contintued)</b></p> <p>3. Matrix Equations</p> <p>4. Determinants and Inverses of 2x2 Matrices</p> <p>5. Solving Equations using inverses</p> <p>6. Determinants and Inverses of 3x3 Matrices</p> <p>7. Augmented Matrices</p> <p><b>E. Square Roots</b></p> <p>1. Simplifying Square Roots</p> <p>2. Operations on Square Roots</p>	<p><b>D. Matrices (contintued)</b></p> <p>D3. Solve Matrix equations by Adding, Subtracting, and Dividing by a scalar.</p> <p>D4. Find the determinant and Inverse of a 2x2 matrix.</p> <p>D5. Solve (2x2) Systems of Equations using inverse matrices.</p> <p>D6. Find determinants and inverses of (3x3) or higher square matrices (in calculator only)</p> <p>D7. Set-up and solve augmented matrices as a way to solve systems of equations (in calculator only)</p> <p><b>E. Square Roots</b></p> <p>E1. Simplify Square Roots</p> <p>E2. a. Add and Subtract Square Roots</p>
<b>December</b>	<p><b>E. Square Roots (continued)</b></p> <p>2. Operations on Square Roots</p> <p>3. Square Roots with fractions</p> <p>4. Solving Equations with square roots</p>	<p><b>E. Square Roots (continued)</b></p> <p>b. Multiply, Distribute and FOIL Square Roots.</p> <p>E3. Simplify square roots with fractions by rationalizing or rationalizing by a conjugate</p> <p>E4. Solve equations with square roots by squaring each side.</p>

Month	Content	Skills
January	<p><b>F. Geometry Review</b></p> <ol style="list-style-type: none"> <li>1. Right Triangles</li> <li>2. Distance and Midpoint</li> <li>3. Circles</li> </ol> <p><b>G. Radicals of Different Degrees and Rational Exponents</b></p> <ol style="list-style-type: none"> <li>1. Simplifying Radicals</li> <li>2. Operations on Radicals</li> <li>3. Rational Exponents</li> <li>4. Exponents</li> <li>5. Operations on Rational Exponents</li> </ol>	<p><b>F. Geometry Review</b></p> <p>F1.</p> <ol style="list-style-type: none"> <li>a. Use Pythagorean Theorem to find missing sides of a right triangle.</li> <li>b. Use 30-60-90 and 45-45-90 shortcuts to find missing sides and angles of right triangles.</li> <li>c. Use Trig Ratios to solve right triangles</li> </ol> <p>F2. Use distance and midpoint formulas to solve ACT type problems.</p> <p>F3. Graph and write equations of circles given radius, diameter, area, or circumference.</p> <p><b>G. Radicals of Different Degrees and Rational Exponents</b></p> <p>G1. Simplify radicals of different degrees completely (including variables).</p> <p>G2. Add, Subtract, Multiply, and Rationalize Radicals of different degrees.</p> <p>G3. Write radical expressions using rational exponents.</p> <p>G4. Use the rules of exponents to simplify expressions.</p> <p>G5. Simplifying, Adding, Subtracting, and Multiplying expressions with rational exponents.</p> <p>G6. Solving equations with radicals of different degrees.</p>

Month	Content	Skills
	6. Solving Equations with Radicals	
<b>February</b>	<p><b>H. Complex Numbers</b></p> <p>1. Simplify Complex Numbers</p> <p>2. Operations on Complex Numbers</p> <p><b>I. Quadratic Functions and their Graphs</b></p> <p>1. Graph Quadratic Functions</p> <p>2. Polynomials</p>	<p><b>H. Complex Numbers</b></p> <p>H1.Simplify radicals into complex numbers.</p> <p>H2. Add, Subtract, Multiply, Distribute and FOIL Complex Numbers.</p> <p><b>I. Quadratic Functions and their Graphs</b></p> <p>I1.</p> <p>a. Graph Quadratics by finding vertex using <math>-b/2a</math> formula, axis of symmetry, and y-intercept and reflecting the y-intercept.</p> <p>b. Graph Quadratics by translations of the parent function.</p> <p>I2.</p> <p>a. Add, Subtract, and multiply polynomials</p> <p>b. Factor polynomials completely</p>
<b>March</b>	<p><b>I. Quadratic Functions and their Graphs (continued)</b></p> <p>5. Solving Quadratic Functions</p>	<p><b>I. Quadratic Functions and their Graphs (continued)</b></p> <p>I5. Find the zero(s) or root(s) of a quadratic function by:</p> <p>a. Graphing</p> <p>b. Factoring</p> <p>c. Square Root Property</p> <p>d. Completing the Square</p> <p>e. Quadratic Formula</p>

Month	Content	Skills
	<p>6. Discriminant</p> <p>7. Applications of Quadratic Functions.</p>	<p>(can have complex solutions)</p> <p>I6. Discriminant to find the type and number of solutions.</p> <p>I7. Applications of Quadratic Functions (Optional)</p> <p>a. Velocity and Height Problems (physics)</p> <p>b. Quadratic Regressions</p>
<p><b>April</b></p>	<p><b>J. Rational Functions</b></p> <p>1. Simplifying Rational Expressions</p> <p>2. Multiplying and Dividing Rational Expressions.</p> <p>3. Adding and Subtracting Rational Expressions</p> <p>4. Solving Rational Equations</p> <p><b>K. ACT/PSAE Test Prep</b></p> <p>1. Test Prep</p> <p><b>L. Composite and Inverse Functions</b></p> <p>1. Function Operations</p>	<p><b>J. Rational Functions</b></p> <p>J1. Simplify rational expressions and find the restrictions on the variable(s)</p> <p>J2. Multiply and divide rational expressions by factoring and cross cancelling</p> <p>J3. Add and Subtract rational expressions by factoring and finding a common denominator.</p> <p>J4. Solve rational equations by cross multiplying or multiplying by the common denominator to eliminate fractions.</p> <p><b>K. ACT/PSAE Test Prep</b></p> <p>K1.</p> <p>a. ACT/PSAE Practice Test</p> <p>b. Work Keys Test Prep</p> <p><b>L. Composite and Inverse Functions</b></p> <p>L1.</p> <p>a. Add, Subtract, Multiply, Divide and Compose Functions.</p> <p>b. Determine Domain and Range of new functions after performing and operation. Determine if the result is still a function.</p>

Month	Content	Skills
	2. Finding inverses	L2. a. Find the inverse of a function from an equation by swapping the x and y and resolving for y.  b. . Determine if two functions are inverses by composing them in both directions.
<b>May</b>	<b>M. Exponential and Logarithmic Functions</b>  1. Exponential Functions  2. Applications of Exponential Growth and Decay.   3. Exponential and Logarithmic Forms  4. Evaluating Logarithms  5. Properties of Logarithms and Natural Logarithms  6. Graphs of Logarithmic Functions  7. Solving Equations	<b>M. Exponential and Logarithmic Functions</b>  M1. Properties of Exponential Functions and their equations.  M2. Apply Exponential Growth and Decay models to solve problems. a. Simple Interest b. Compounded Interest c. Continuously Compounded Interest d. Half Life/Radioactive Decay e. Population growth and decay  M3. Write exponential equations using logarithms, and write logarithmic equations using exponents.  M4. Evaluate Logarithmic expressions.  M5. Use properties of logarithms and natural logarithms to rewrite expressions.  M6. Graph Logarithmic Functions  M7. a. Solve exponential equations using logs and natural logs.  b. Solve logarithmic equations using exponents and $e=2.71$ .