

**Virginia Standards of Learning Assessment  
Algebra 2 Performance Level Descriptors**

Fail/Does Not Meet	Pass/Proficient	Pass/Advanced
<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 1: Expressions and Operations</i></p> <ul style="list-style-type: none"> <li>• Add, subtract, and simplify:               <ul style="list-style-type: none"> <li>○ rational expressions having like denominators</li> <li>○ radical expressions with positive numeric monomial expressions and no leading coefficients</li> <li>○ polynomial expressions in one variable</li> <li>○ complex numbers</li> </ul> </li> <li>• Factor polynomials with no more than three terms</li> </ul>	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 1: Expressions and Operations</i></p> <ul style="list-style-type: none"> <li>• Determine equivalency among:               <ul style="list-style-type: none"> <li>○ rational algebraic expressions</li> <li>○ radical expressions</li> </ul> </li> <li>• Simplify, add, subtract, multiply, and divide:               <ul style="list-style-type: none"> <li>○ rational algebraic expressions</li> <li>○ radical expressions, including rationalizing the denominator</li> <li>○ polynomial expressions in one and two variables</li> <li>○ complex numbers</li> </ul> </li> <li>• Convert between radical expressions and expressions containing rational exponents</li> </ul>	<p>A student performing at this level should be able to:</p> <p><i>Reporting Category 1: Expressions and Operations</i></p> <ul style="list-style-type: none"> <li>• Perform multiple operations (add, subtract, multiply and divide) and simplify:               <ul style="list-style-type: none"> <li>○ rational expressions including complex algebraic fractions containing binomial expressions</li> <li>○ radical expressions, including rationalizing denominators containing algebraic radicands</li> <li>○ polynomial expressions</li> <li>○ complex numbers</li> </ul> </li> <li>• Discriminate between methods to efficiently factor polynomials that require multiple steps</li> </ul>

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<p><i>Reporting Category 2: Equations and Inequalities</i></p> <ul style="list-style-type: none"> <li>• Determine the solutions, given a graph, of:               <ul style="list-style-type: none"> <li>○ Absolute Value equations</li> <li>○ Linear-Quadratic and Quadratic-Quadratic Systems of equations</li> <li>○ Rational equation</li> <li>○ Radical equation</li> <li>○ Polynomial equation (degree 3 or higher)</li> </ul> </li> <li>○ Solve a quadratic equation in one variable over the set of complex numbers</li> </ul>	<p><i>Reporting Category 2: Equations and Inequalities</i></p> <ul style="list-style-type: none"> <li>• Factor polynomials completely over the set of integers</li> <li>• Explain the meaning of <math>i</math></li> </ul> <p><i>Reporting Category 2: Equations and Inequalities</i></p> <ul style="list-style-type: none"> <li>• Solve, represent the solution graphically and using symbolic notation, and verify the solution using technology of:               <ul style="list-style-type: none"> <li>○ Absolute Value Equations</li> <li>○ Quadratic Equations over the set of complex numbers</li> <li>○ Linear-Quadratic and Quadratic-Quadratic Systems of Equations</li> <li>○ Rational Equations</li> <li>○ Radical Equations</li> <li>○ Polynomial Equations</li> </ul> </li> <li>• Solve and represent the solution graphically and using symbolic notation of:</li> </ul>	<p><i>Reporting Category 2: Equations and Inequalities</i></p> <ul style="list-style-type: none"> <li>• Demonstrate equality of polynomial expressions written in different forms</li> </ul> <p><i>Reporting Category 2: Equations and Inequalities</i></p> <ul style="list-style-type: none"> <li>• Create and solve equations to model a contextual situation, including interpreting solutions, of:               <ul style="list-style-type: none"> <li>○ Absolute Value</li> <li>○ Quadratic</li> <li>○ Linear-Quadratic and Quadratic-Quadratic Systems</li> <li>○ Rational</li> <li>○ Radical</li> <li>○ Polynomial</li> </ul> </li> <li>• Create and solve inequalities to model a contextual situation, including interpreting solutions, of:               <ul style="list-style-type: none"> <li>○ Absolute Value</li> <li>○ Quadratic</li> </ul> </li> </ul>

Fail/Does Not Meet	Pass/Proficient	Pass/Advanced
<p><i>Reporting Category 3: Functions and Statistics</i></p> <p><i>Functions</i></p> <ul style="list-style-type: none"> <li>• Identify the equations and graphs of parent functions including square root, cube root, rational, exponential, and logarithmic</li> <li>• Identify whether a situation can be represented by a direct or inverse variation</li> <li>• Identify characteristics of a square root, cube root, rational, polynomial, exponential function including: <ul style="list-style-type: none"> <li>○ zeros,</li> <li>○ intercepts</li> <li>○ increasing/decreasing intervals</li> </ul> </li> <li>• Determine the inverse of a linear function</li> </ul>	<ul style="list-style-type: none"> <li>○ Absolute Value Inequalities</li> <li>○ Quadratic Inequalities</li> </ul> <p><i>Reporting Category 3: Functions and Statistics</i></p> <p><i>Functions</i></p> <ul style="list-style-type: none"> <li>• Distinguish between the graphs of parent functions for square root, cube root, rational, exponential, and logarithmic function families</li> <li>• Graph or write the equation of square root, cube root, rational, exponential, and logarithmic functions using transformation(s) of the parent function</li> <li>• Write an equation or create a graph to represent a direct or inverse variation</li> <li>• Determine and compare characteristics of square root, cube root, rational, polynomial, exponential, logarithmic, and piecewise-defined functions, including:</li> </ul>	<p><i>Reporting Category 3: Functions and Statistics</i></p> <p><i>Functions</i></p> <ul style="list-style-type: none"> <li>• Analyze, graph, and write the equation of square root, cube root, rational, exponential, and logarithmic functions using transformation(s) of the parent function</li> <li>• Analyze and compare and contrast characteristics of square root, cube root, rational, polynomial, exponential, logarithmic, and piecewise-defined functions, including: <ul style="list-style-type: none"> <li>○ zeros,</li> <li>○ intercepts,</li> <li>○ domain and range</li> <li>○ increasing, decreasing, and constant intervals,</li> </ul> </li> </ul>

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<p><i>Statistics</i></p> <ul style="list-style-type: none"> <li>• Formulate questions that require the collection of univariate and bivariate data</li> <li>• Identify properties of a normal distribution</li> <li>• Calculate z-scores given a data value</li> </ul>	<ul style="list-style-type: none"> <li>○ zeros,</li> <li>○ intercepts,</li> <li>○ domain and range</li> <li>○ increasing, decreasing, and constant intervals,</li> <li>○ location and value of absolute/relative maxima and minima</li> <li>○ end behavior</li> <li>○ asymptotes</li> <li>• Determine the inverse of a function algebraically and graphically</li> <li>• Graph the inverse of a function as a reflection over the line <math>y=x</math></li> <li>• Determine the composition of two functions algebraically and graphically</li> </ul> <p><i>Statistics</i></p> <ul style="list-style-type: none"> <li>• Examine, describe, and interpret a normal data distribution by analyzing the shape, center, and spread</li> <li>• Solve problems and compare normally distributed data sets, including those in context, using: <ul style="list-style-type: none"> <li>○ mean,</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>○ location and value of absolute/relative maxima and minima</li> <li>○ end behavior</li> <li>○ asymptotes</li> <li>• Justify and explain why two functions are inverses of each other</li> </ul> <p><i>Statistics</i></p> <ul style="list-style-type: none"> <li>• Apply the Empirical Rule in contextual situations to determine the probability associated with areas under the normal curve</li> </ul>

Fail/Does Not Meet	Pass/Proficient	Pass/Advanced
<ul style="list-style-type: none"> <li>• Represent bivariate data in a scatterplot using technology</li> <li>• Identify curves of best fit (linear, quadratic, exponential) given a graph</li> <li>• Identify and calculate a permutation or combination</li> </ul>	<ul style="list-style-type: none"> <li>○ standard deviation</li> <li>○ z-scores</li> <li>• Apply the Empirical Rule to determine the probability associated with areas under the normal curve</li> <li>• Determine the equation of the function that best models the relationship between two variables using technology</li> <li>• Use the correlation coefficient to designate the goodness of fit of a linear function using technology</li> <li>• Make predictions and decisions using data, scatterplots, or curve of best fit</li> <li>• Compare, contrast, and solve problems involving permutations and combinations, including those in context</li> </ul>	<ul style="list-style-type: none"> <li>• Analyze, compare, and interpret normally distributed data sets in context using z-scores</li> <li>• Make critical judgements using data, scatterplots, or curve of best fit</li> <li>• Evaluate the reasonableness of the curve of best fit in a contextual situation</li> </ul>