

<p><b>Algebraic Thinking</b>  High school students extend analysis and use of functions and focus on linear, quadratic, absolute value and exponential functions. They explore parametric changes on graphs of functions. They use rules and properties to simplify algebraic expressions. They combine simple rational expressions and combine simple polynomial expressions. They factor polynomial expressions and quadratics of the form <math>1x^2 + bx + c</math>.</p>
<p><b>High School</b></p>
<p><b>Patterns, Relations and Functions</b></p>
<p><b>MA-HS-5.1.1</b>  <b>Students will identify multiple representations (tables, graphs, equations) of functions (linear, quadratic, absolute value, exponential) in real-world or mathematical problems.</b></p> <p style="text-align: right;"><b>DOK 2</b></p>
<p><i>MA-HS-5.1.2</i>  <i>Students will identify, relate and apply representations (graphs, equations, tables) of a piecewise function (such as long distance telephone rates) from mathematical or real-world information.</i></p>
<p><i>MA-HS-5.1.3</i>  <i>Students will demonstrate how equations and graphs are models of the relationship between two real-world quantities (e.g., the relationship between degrees Celsius and degrees Fahrenheit).</i></p>
<p><i>MA-HS-5.1.4</i>  Students will recognize and solve problems that can be modeled using an exponential function, such as compound interest problems.</p>
<p><b>MA-HS-5.1.5</b>  <b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>determine if a relation is a function;</b></li> <li>• <b>determine the domain and range of a function (linear and quadratic);</b></li> <li>• <b>determine the slope and intercepts of a linear function;</b></li> <li>• <b>determine the maximum, minimum, and intercepts (roots/zeros) of a quadratic function and</b></li> <li>• <b>evaluate a function written in function notation for a specified rational number.</b></li> </ul> <p style="text-align: right;"><b>DOK 2</b></p>
<p><i>MA-HS-5.1.6</i>  <i>Students will find the domain and range for absolute value functions.</i></p>

<p><i>MA-HS-5.1.7</i>  <i>Students will apply and use direct and inverse variation to solve real-world and mathematical problems.</i></p>	
<p><b>MA-HS-5.1.8</b>  <b>Students will identify the changes and explain how changes in parameters affect graphs of functions (linear, quadratic, absolute value, exponential) (e.g., compare <math>y = x^2</math>, <math>y = 2x^2</math>, <math>y = (x-4)^2</math>, and <math>y = x^2+3</math>).</b></p>	<b>DOK 2</b>
<b>Variables, Expressions, and Operations</b>	
<p><b>MA-HS-5.2.1</b>  <b>Students will apply order of operations, real number properties (identity, inverse, commutative, associative, distributive, closure) and rules of exponents (integer) to simplify algebraic expressions.</b></p>	<b>DOK 1</b>
<p><i>MA-HS-5.2.2</i>  <i>Students will evaluate polynomial and rational expressions and expressions containing radicals and absolute values at specified values of their variables.</i></p>	
<p><b>MA-HS-5.2.3</b>  <b>Students will:</b></p> <ul style="list-style-type: none"> <li>• <b>add, subtract and multiply polynomial expressions;</b></li> <li>• <b>factor polynomial expressions using the greatest common monomial factor and</b></li> <li>• <b>factor quadratic polynomials of the form <math>ax^2 + bx + c</math>, when <math>a = 1</math> and <math>b</math> and <math>c</math> are integers.</b></li> </ul>	<b>DOK 2</b>
<p><i>MA-HS-5.2.4</i>  <i>Students will factor quadratic polynomials, such as perfect square trinomials and quadratic polynomials of the form <math>ax^2 + bx + c</math> when <math>a \neq 1</math> and <math>b</math> and <math>c</math> are integers.</i></p>	
<p><b>MA-HS-5.2.5</b>  <b>Students will add, subtract, multiply and divide simple rational expressions with monomial first-degree denominators and integer numerators (e.g., <math>\frac{3}{5x} + \frac{4}{3y}</math>; <math>\frac{9}{2a} - \frac{-7}{4b}</math>; <math>\frac{3}{-5x} \times \frac{-4}{7y}</math>; <math>\frac{5}{2c} \div \frac{9}{-11d}</math>), and will express the results in simplified form.</b></p>	<b>DOK 1</b>

<b>Equations and Inequalities</b>	
<b>MA-HS-5.3.1</b> Students will model, solve and graph first degree, single variable equations and inequalities, including absolute value, based in real-world and mathematical problems and graph the solutions on a number line.	<b>DOK 2</b>
<i>MA-HS-5.3.2</i> <i>Students will solve for a specified variable in a multivariable equation.</i>	
<b>MA-HS-5.3.3</b> Students will model, solve and graph first degree, two-variable equations and inequalities in real-world and mathematical problems.	<b>DOK 2</b>
<b>MA-HS-5.3.4</b> Students will model, solve and graph systems of two linear equations in real-world and mathematical problems.	<b>DOK 3</b>
<i>MA-HS-5.3.5</i> <i>Students will write, graph, and solve systems of two linear inequalities based on real-world or mathematical problems and interpret the solution.</i>	
<b>MA-HS-5.3.6</b> Students will model, solve and graph quadratic equations in real-world and mathematical problems.	<b>DOK 2</b>