Standards to Topics

Common Core State Standards 2010 *Grade 6*	Intensified Algebra I
6-RP.A.01 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."*	8. Mindset, motivation, and algebraic thinking
6-RP.A.02 Understand the concept of a unit rate a/b associated with a ratio $a:b$ with $b \neq 0$, and use rate language in the context of a ratio relationship. *For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."*[1]	8. Mindset, motivation, and algebraic thinking
6-NS.C.06.c Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.	5. Problem solving and metacognition
6-EE.A.02.a Write expressions that record operations with numbers and with letters standing for numbers. *For example, express the calculation "Subtract y from 5" as $5 - y$.*	3. Foundations of algebra
6-EE.A.02.c Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). *For example, use the formulas $V = s^3$ and $A = 6 s^2$ to find the volume and surface area of a cube with sides of length $s = 1/2$.*	3. Foundations of algebra
6-EE.A.03 Apply the properties of operations to generate equivalent expressions. *For example, apply the distributive property to the expression $3 (2 + x)$ to produce the equivalent expression $6 + 3x$; apply the distributive property to the expression $24x + 18y$ to produce the equivalent expression $6 (4x + 3y)$; apply properties of operations to $y + y + y$ to produce the equivalent expression $3y$.*	3. Foundations of algebra

Common Core State Standards 2010	Intensified Algebra I
Grade 6	
6-EE.A.04 Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). *For example, the expressions* $y + y + y$ *and* $3y$ *are equivalent because they name the same number regardless of which number* y *stands for.*	3. Foundations of algebra
6-EE.B.06 Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.	3. Foundations of algebra 4. Representing mathematical relationships in multiple ways
6-EE.C.09 Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation* $d = 65t$ *to represent the relationship between distance and time.*	4. Representing mathematical relationships in multiple ways 6. Working with functions and equations
Grade 7	
7-RP.A.01 Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction (1/2)/(1/4) miles per hour, equivalently 2 miles per hour.*	8. Mindset, motivation, and algebraic thinking
7-RP.A.02.a Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	6. Working with functions and equations
7-NS.A.02.a Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.	2. Getting smarter through algebraic reasoning

Common Core State Standards 2010	Intensified Algebra I
Grade 7	
7-NS.A.02.b Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing realworld contexts.	2. Getting smarter through algebraic reasoning
7-NS.A.02.c Apply properties of operations as strategies to multiply and divide rational numbers.	2. Getting smarter through algebraic reasoning
7-NS.A.03 Solve real-world and mathematical problems involving the four operations with rational numbers.[1]	1. Exploring problem-solving strategies
7-EE.A.01 Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.	3. Foundations of algebra
7-EE.B.04.a Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*	3. Foundations of algebra
Grade 8	
8-EE.B.05 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	9. Exploring rate of change in other situations
8-F.B.05 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	7. Exploring rate of change in motion problems
Number and Quantity	

Common Core State Standards 2010	Intensified Algebra I
Number and Quantity	
N-RN.A.01 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)\wedge 3}$ to hold, so $(5^{1/3})^3$ must equal 5.*	25. Exponents and exponential models
N-RN.A.02 Rewrite expressions involving radicals and rational exponents using the properties of exponents.	25. Exponents and exponential models
N-RN.B.03 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	22. Quadratic models and equations
N-Q.A.01 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	5. Problem solving and metacognition
N-Q.A.02 Define appropriate quantities for the purpose of descriptive modeling.	2. Getting smarter through algebraic reasoning
N-Q.A.03 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	7. Exploring rate of change in motion problems
Algebra	
A-SSE.A.01.a Interpret parts of an expression, such as terms, factors, and coefficients.	4. Representing mathematical relationships in multiple ways 23. Operations on polynomials
A-SSE.A.01.b Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $\mathbf{P}(1+\mathbf{r})^{\mathbf{n}}$ as the product of $\mathbf{P}$ and a factor not depending on $\mathbf{P}$.*	4. Representing mathematical relationships in multiple ways
A-SSE.A.02 Use the structure of an expression to identify ways to rewrite it. *For example, see $\mathbf{x}^4 - \mathbf{y}^4$ as $(\mathbf{x}^2)^2 - (\mathbf{y}^2)^2$, thus recognizing it as a difference of squares that can be factored as $(\mathbf{x}^2 - \mathbf{y}^2)(\mathbf{x}^2 + \mathbf{y}^2)$.*	3. Foundations of algebra 24. Factoring and quadratic equations

Common Core State Standards 2010 *Algebra*	Intensified Algebra I
A-SSE.B.03.a Factor a quadratic expression to reveal the zeros of the function it defines.	24. Factoring and quadratic equations
A-SSE.B.03.b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	24. Factoring and quadratic equations
A-SSE.B.03.c Use the properties of exponents to transform expressions for exponential functions. *For example the expression 1.15**t** can be rewritten as* $(1.15^{1/12})^{12t}$ *almost equal to 1.01212**t** to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	26. Problem solving with exponential functions
A-APR.A.01 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	23. Operations on polynomials
A-APR.B.03 Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	24. Factoring and quadratic equations 27. Cubic, square root, cube root, and step functions
A-CED.A.01 Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	16. Solving linear equations 18. Solving linear inequalities
A-CED.A.02 Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	10. Understanding slope and intercepts 11. Parallel and perpendicular lines 17. Problem solving with slope triangles 22. Quadratic models and equations 26. Problem solving with exponential functions
A-CED.A.03 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	16. Solving linear equations 18. Solving linear inequalities 19. Formulating and solving systems 21. Other methods for solving systems

Common Core State Standards 2010 *Algebra*	Intensified Algebra I
A-CED.A.04 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law* $V = IR$ *to highlight resistance* R.	16. Solving linear equations
A-REI.A.01 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	16. Solving linear equations
A-REI.B.03 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	16. Solving linear equations 18. Solving linear inequalities 20. Building fluency with equation solving
A-REI.B.04.a Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	24. Factoring and quadratic equations
A-REI.B.04.b Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	22. Quadratic models and equations 24. Factoring and quadratic equations
A-REI.C.05 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	21. Other methods for solving systems
A-REI.C.06 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	19. Formulating and solving systems 21. Other methods for solving systems
A-REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	6. Working with functions and equations

Common Core State Standards 2010	Intensified Algebra I
Algebra	
A-REI.D.11 Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	16. Solving linear equations 22. Quadratic models and equations
A-REI.D.12 Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	18. Solving linear inequalities 19. Formulating and solving systems
Functions	
F-IF.A.01 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x. The graph of f is the graph of the equation $y = f(x)$.	6. Working with functions and equations
F-IF.A.02 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	6. Working with functions and equations
F-IF.A.03 Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ *for* $n \geq 1$.	6. Working with functions and equations
F-IF.B.04 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.**	7. Exploring rate of change in motion problems 9. Exploring rate of change in other situations 10. Understanding slope and intercepts 17. Problem solving with slope triangles 22. Quadratic models and equations 24. Factoring and quadratic equations 26. Problem solving with exponential functions

Common Core State Standards 2010 *Functions*	Intensified Algebra I
F-IF.B.05 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *For example, if the function* ***h(n)*** *gives the number of person-hours it takes to assemble* ***n*** *engines in a factory, then the positive integers would be an appropriate domain for the function.**	6. Working with functions and equations 22. Quadratic models and equations 26. Problem solving with exponential functions
F-IF.B.06 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.*	7. Exploring rate of change in motion problems 9. Exploring rate of change in other situations 10. Understanding slope and intercepts
F-IF.C.07.a Graph linear and quadratic functions and show intercepts, maxima, and minima.	10. Understanding slope and intercepts 11. Parallel and perpendicular lines 22. Quadratic models and equations 24. Factoring and quadratic equations
F-IF.C.07.b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	10. Understanding slope and intercepts 27. Cubic, square root, cube root, and step functions
F-IF.C.07.e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	26. Problem solving with exponential functions
F-IF.C.08.a Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	24. Factoring and quadratic equations
F-IF.C.08.b Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as* $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, *and classify them as representing exponential growth or decay.*	26. Problem solving with exponential functions
F-IF.C.09 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.*	10. Understanding slope and intercepts 26. Problem solving with exponential functions

Common Core State Standards 2010	Intensified Algebra I
Functions	
F-BF.A.01.a Determine an explicit expression, a recursive process, or steps for calculation from a context.	3. Foundations of algebra 6. Working with functions and equations 10. Understanding slope and intercepts 22. Quadratic models and equations 26. Problem solving with exponential functions
F-BF.A.02 Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*	6. Working with functions and equations
F-BF.B.03 Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k\,f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*	12. Creating linear models for data 22. Quadratic models and equations 26. Problem solving with exponential functions 27. Cubic, square root, cube root, and step functions
F-LE.A.01.a Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	10. Understanding slope and intercepts 26. Problem solving with exponential functions
F-LE.A.01.b Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	7. Exploring rate of change in motion problems 9. Exploring rate of change in other situations 10. Understanding slope and intercepts
F-LE.A.01.c Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	26. Problem solving with exponential functions
F-LE.A.02 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	6. Working with functions and equations 10. Understanding slope and intercepts 11. Parallel and perpendicular lines 26. Problem solving with exponential functions
F-LE.A.03 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	25. Exponents and exponential models 26. Problem solving with exponential functions
F-LE.B.05 Interpret the parameters in a linear or exponential function in terms of a context.	10. Understanding slope and intercepts 26. Problem solving with exponential functions
Statistics and Probability	

Common Core State Standards 2010 *Statistics and Probability*	Intensified Algebra I
S-ID.A.01 Represent data with plots on the real number line (dot plots, histograms, and box plots).	13. Analyzing univariate data
S-ID.A.02 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	14. Comparing distributions
S-ID.A.03 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	13. Analyzing univariate data
S-ID.B.05 Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	15. Analyzing bivariate data
S-ID.B.06.a Fit a function to the data; use functions fitted to data to solve problems in the context of the data. *Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.*	12. Creating linear models for data 22. Quadratic models and equations 26. Problem solving with exponential functions
S-ID.B.06.b Informally assess the fit of a function by plotting and analyzing residuals.	15. Analyzing bivariate data
S-ID.B.06.c Fit a linear function for a scatter plot that suggests a linear association.	12. Creating linear models for data
S-ID.C.07 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	10. Understanding slope and intercepts 12. Creating linear models for data
S-ID.C.08 Compute (using technology) and interpret the correlation coefficient of a linear fit.	12. Creating linear models for data
S-ID.C.09 Distinguish between correlation and causation.	12. Creating linear models for data