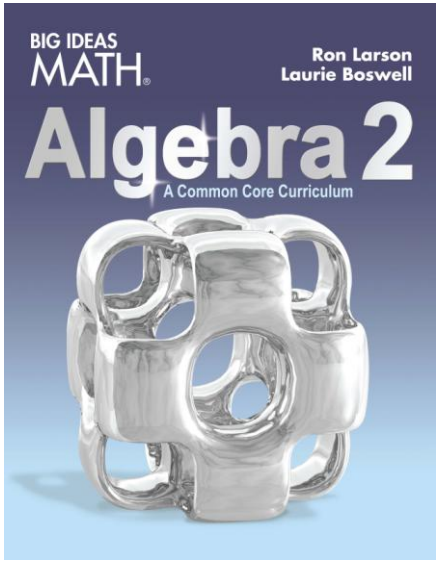
Big Ideas Math Algebra 2



Correlations to the Common Core State Standards

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Correlated to
Common Core State Standards for High School Algebra 2

Standard		Pages or Locations Where Standard is Addressed
Conceptual Category: Number and Quantity		
Domain: The Number System		
N.RN.1	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* $(5^{1/3})^3 = 5^{(1/3)3}$ *to hold, so* $(5^{1/3})^3$ *must equal 5.*	*Primary SE/TE:* 237-242 (5.1)
N.RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	*Primary SE/TE:* 237-242 (5.1), 243-250 (5.2) *Supporting SE/TE:* 253 (5.3), 261-268 (5.4), 271-274 (5.5), 299 (6.1), 304, 305 (6.2), 334 (6.6), 344 (6.7)
Domain: Quantities		
N.Q.2	Define appropriate quantities for the purpose of descriptive modeling.	*Supporting SE/TE:* 23, 26 (1.3), 60, 63 (2.2), 77, 79, 81, 82 (2.4), 97, 98, 100-102 (3.1), 115, 117 (3.3), 126, 128, 129 (3.4), 183, 185 (4.4), 505-512 (9.6)
Domain: The Complex Number System		
N.CN.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	*Primary SE/TE:* 103-110 (3.2)
N.CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	*Primary SE/TE:* 105-110 (3.2) *Supporting SE/TE:* 123 (3.4), 200 (4.6)
N.CN.7	Solve quadratic equations with real coefficients that have complex solutions.	*Primary SE/TE:* 103, 107, 109 (3.2), 114, 116 (3.3), 121, 123, 127, 128 (3.4) *Supporting SE/TE:* 199 (4.6)
N.CN.8	Extend polynomial identities to the complex numbers. *For example, rewrite* $x^2 + 4$ *as* $(x + 2i)(x - 2i)$.	*Primary SE/TE:* 199 (4.6) *Supporting SE/TE:* 107 (3.2)
N.CN.9	Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	*Primary SE/TE:* 198-204 (4.6)
Conceptual Category: Algebra		
Domain: Seeing Structure in Expressions		
A.SSE.1	Interpret expressions that represent a quantity in terms of its context.	
	a. Interpret parts of an expression, such as terms, factors, and coefficients.	*Supporting SE/TE:* 23, 26 (1.3), 60, 63 (2.2), 77, 79, 81, 82 (2.4), 97, 98, 100-102 (3.1), 115, 117 (3.3), 126, 128, 129 (3.4), 183, 185 (4.4), 505-512 (9.6)
	b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret* $P(1+r)^n$ *as the product of P and a factor not depending on P.*	*Supporting SE/TE:* 97 (3.1), 180-186 (4.4), 190-196 (4.5), 296-302 (6.1), 305-308 (6.2)
A.SSE.2	Use the structure of an expression to identify ways to rewrite it. *For example, see* $x^4 - y^4$ *as* $(x^2)^2 - (y^2)^2$*, thus recognizing it as a difference of squares that can be factored as* $(x^2 - y^2)(x^2 + y^2)$.	*Primary SE/TE:* 96, 100, 102 (3.1), 179-186 (4.4), 327, 329-332 (6.5) *Supporting SE/TE:* 111-118 (3.3), 121, 123 (3.4), 133, 134 (3.5), 142 (3.6), 190-192 (4.5), 199 (4.6), 263-265 (5.4), 299, 301 (6.1), 305, 307 (6.2), 312 (6.3), 334, 336 (6.6), 344 (6.7), 368, 371 (7.2), 376-382 (7.3), 385-390 (7.4), 393, 394 (7.5), 515, 517 (9.7), 521-524 (9.8)

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Standard		Pages or Locations Where Standard is Addressed
A.SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	
	c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression* 1.15^{t} *can be rewritten as* $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ *to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	*Primary SE/TE:* 299, 301 (6.1) *Supporting SE/TE:* 305, 307 (6.2), 344, 347 (6.7)
A.SSE.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*	*Primary SE/TE:* 425, 428, 429, 431, 432 (8.3), 435-440 (8.4)
Domain: Arithmetic with Polynomials and Rational Expressions		
A.APR.1	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.	*Primary SE/TE:* 165-172 (4.2) *Supporting SE/TE:* 174 (4.3), 193, 195 (4.5), 200, 202 (4.6), 377-382 (7.3), 385-390 (7.4), 393, 394, 396, 397 (7.5)
A.APR.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.	*Primary SE/TE:* 176, 178 (4.3), 182-186 (4.4) *Supporting SE/TE:* 191, 192 (4.5)
A.APR.3	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.	*Primary SE/TE:* 59, 60, 63, 64 (2.2), 183, 185 (4.4), 190, 192, 194, 195 (4.5), 199, 202 (4.6), 212, 213, 216, 217 (4.8) *Supporting SE/TE:* 96, 97, 100 (3.1), 142, 145 (3.6)
A.APR.4	Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity* $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ *can be used to generate Pythagorean triples.*	*Primary SE/TE:* 168, 171, 172 (4.2)
A.APR.5	Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.	*Primary SE/TE:* 165, 169, 171, 172 (4.2), 574, 577 (10.5)
A.APR.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.	*Primary SE/TE:* 174, 175, 177, 178 (4.3), 368, 371 (7.2), 376, 380, 381 (7.3), 386, 389, 390 (7.4)
A.APR.7	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	*Primary SE/TE:* 375, 377-382 (7.3), 383-390 (7.4)

Items in brackets are required in Algebra 1.

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Standard		Pages or Locations Where Standard is Addressed
Domain: Creating Equations		
A.CED.1	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.*	*Primary SE/TE:* 143, 145, 146 (3.6), 362, 364 (7.1) *Supporting SE/TE:* 22-24, 26-28 (1.3), 76-78, 81, 82 (2.4), 97, 98, 100-102 (3.1), 115, 117, 118 (3.3), 126, 128-130 (3.4), 195, 196 (4.5), 240-242 (5.1), 254, 257, 258 (5.3), 298-302 (6.1), 306, 308 (6.2), 330, 332 (6.5), 335, 338-340 (6.6), 345, 347, 348 (6.7), 379, 381, 382 (7.3), 392, 395-398 (7.5), 465, 467, 468 (9.1)
A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	*Primary SE/TE:* 21-28 (1.3), 75-82 (2.4), 219-224 (4.9), 341, 343-348 (6.7), 359, 361-364 (7.1), 505-512 (9.6) *Supporting SE/TE:* 12-18 (1.2), 33-36 (1.4), 48-54 (2.1), 68-74 (2.3), 97, 98, 100-102 (3.1), 126, 128-130 (3.4), 205-210 (4.7), 252-258 (5.3), 275-284 (5.6), 297, 298, 300-302 (6.1), 318-324 (6.4), 366-372 (7.2), 379, 381, 382 (7.3), 395, 397 (7.5)
A.CED.3	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*.	*Primary SE/TE:* 33-36 (1.4), 137, 138 (3.5), 141, 143-146 (3.6), 362, 364 (7.1) *Supporting SE/TE:* 21-28 (1.3), 97, 98, 100, 101 (3.1), 126, 128, 129 (3.4), 201, 203 (4.6), 267 (5.4), 335, 338-340 (6.6), 369, 371, 372 (7.2)
A.CED.4	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*.	*Primary SE/TE:* 280, 282-284 (5.6), 395, 397 (7.5) *Supporting SE/TE:* 26 (1.3), 268 (5.4), 340 (6.6)
Domain: Reasoning with Equations and Inequalities		
A.REI.1	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.	*Primary SE/TE:* 262-268 (5.4), 334-336, 338-340 (6.6), 392-398 (7.5) *Supporting SE/TE:* 240, 242 (5.1), 419, 420, 422, 423 (8.2), 427, 428, 430 (8.3), 464, 465, 467, 468 (9.1)
A.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	*Primary SE/TE:* 261-268 (5.4), 391-398 (7.5)
A.REI.4	Solve quadratic equations in one variable.	
	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.	*Primary SE/TE:* 93-102 (3.1), 107, 109 (3.2), 112-118 (3.3), 121-130 (3.4) *Supporting SE/TE:* 133, 134, 136, 137 (3.5), 142, 143, 145, 146 (3.6), 190, 192 (4.5), 199 (4.6), 263-265 (5.4), 336 (6.6), 393, 394 (7.5)
A.REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	*Primary SE/TE:* 29-36 (1.4) *Supporting SE/TE:* 78, 81 (2.4), 420, 423 (8.2), 428, 430 (8.3)
A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. *For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.*	*Primary SE/TE:* 131-138 (3.5) *Supporting SE/TE:* 267 (5.4)
A.REI.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.	*Primary SE/TE:* 135, 137 (3.5) *Supporting SE/TE:* 196 (4.5), 264, 268 (5.4), 333, 334, 339 (6.6), 391, 394, 398 (7.5)
Conceptual Category: Functions		

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Standard		Pages or Locations Where Standard is Addressed
Domain: Interpreting Functions		
F.IF.3	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 ≥ 1* .	*Primary SE/TE:* 409-411, 414, 415 (8.1), 417-424 (8.2), 425-428, 430-432 (8.3), 441-450 (8.5)
F.IF.4	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* .	*Primary SE/TE:* 55-64 (2.2), 67-74 (2.3), 157-164 (4.1), 211-218 (4.8) *Supporting SE/TE:* 21-23, 26-28 (1.3), 183, 185 (4.4), 295-302 (6.1), 303-308 (6.2), 309, 313, 315, 316 (6.3), 365-372 (7.2), 436, 437, 439 (8.4), 445 (8.5), 485-494 (9.4), 497-504 (9.5)
F.IF.5	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.*	*Supporting SE/TE:* 4, 9 (1.1), 28 (1.3), 58, 62, 64 (2.2), 77, 81 (2.4), 141, 145, 146 (3.6), 161, 163 (4.1), 201 (4.6), 251, 252, 256-258 (5.3), 270, 271, 273 (5.5), 277-284 (5.6), 295, 296, 302 (6.1), 309, 313, 315, 316 (6.3), 365-372 (7.2), 486 (9.4), 498, 500 (9.5)
F.IF.6	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.	*Primary SE/TE:* 77, 80, 82 (2.4) *Supporting SE/TE:* 21-28 (1.3), 161, 163 (4.1), 258 (5.3), 302 (6.1), 306 (6.2), 315 (6.3), 371 (7.2), 493 (9.4), 503 (9.5)
F.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	
	b. Graph square root, cube root, [and piecewise-defined] functions, [including step functions and absolute value functions].	*Primary SE/TE:* 251-258 (5.3) *Supporting SE/TE:* 261, 264, 265, 268 (5.4), 270 (5.5), 275, 278, 279, 282 (5.6)
	c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.	*Primary SE/TE:* 47-54 (2.1), 55-64 (2.2), 69, 72 (2.3), 157-164 (4.1), 205-210 (4.7), 211-218 (4.8) *Supporting SE/TE:* 93, 94, 96, 98, 99, 101, 102 (3.1), 139-146 (3.6), 190, 192, 194, 196 (4.5), 222 (4.9)
	e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	*Primary SE/TE:* 295, 297, 298, 300, 302 (6.1), 303, 305, 307 (6.2), 309, 312, 313, 315, 316 (6.3), 317-324 (6.4), 485-494 (9.4), 497-504 (9.5)

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Standard		Pages or Locations Where Standard is Addressed
F.IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	
	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.	*Primary SE/TE:* 96, 97, 100 (3.1), 114, 115, 117, 118 (3.3)
	b. Use the properties of exponents to interpret expressions for exponential functions. *For example, identify percent rate of change in functions such as* $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^t/10$, *and classify them as representing exponential growth or decay.*	*Primary SE/TE:* 298-302 (6.1) *Supporting SE/TE:* 305, 307 (6.2), 344, 347 (6.7)
F.IF.9	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* .	*Primary SE/TE:* 23, 26 (1.3), 60, 63 (2.2) *Supporting SE/TE:* 224 (4.9), 258 (5.3), 302 (6.1), 306, 308 (6.2), 315 (6.3), 372 (7.2), 503 (9.5), 511 (9.6)
Domain: Building Functions		
F.BF.1	Write a function that describes a relationship between two quantities.	
	a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	*Primary SE/TE:* 21-28 (1.3), 75-82 (2.4), 219, 222-224 (4.9), 343-348 (6.7), 445, 446, 448-450 (8.5), 505, 506, 508-512 (9.6) *Supporting SE/TE:* 97, 98, 100-102 (3.1), 126, 128-130 (3.4), 298-302 (6.1), 359, 362, 364 (7.1), 379, 381, 382 (7.3)
	b. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model* .	*Primary SE/TE:* 269-274 (5.5) *Supporting SE/TE:* 335, 338 (6.6), 379, 381 (7.3)
F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	*Primary SE/TE:* 417-424 (8.2), 425-432 (8.3), 441-450 (8.5)
F.BF.3	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.	*Primary SE/TE:* 4-10 (1.1), 11-18 (1.2), 47-54 (2.1), 205-210 (4.7), 215, 217, 218 (4.8), 251, 253, 254, 256, 257 (5.3), 317-324 (6.4), 365-368, 370-371 (7.2), 487-494 (9.4), 497, 499-503 (9.5) *Supporting SE/TE:* 386, 389 (7.4), 517 (9.7)
F.BF.4	Find inverse functions.	
	a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. *For example,* $f(x) = 2x^3$ *or* $f(x) = (x+1)/(x-1)$ *for* $x \neq 1$.	*Primary SE/TE:* 276-284 (5.6), 312, 315 (6.3) *Supporting SE/TE:* 395, 397, 398 (7.5)
Domain: Linear, Quadratic, and Exponential Models		
F.LE.2	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).	*Primary SE/TE:* 21-28 (1.3), 298, 300-302 (6.1), 343-348 (6.7), 417-424 (8.2), 425-432 (8.3)
F.LE.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.	*Primary SE/TE:* 311, 314 (6.3), 330, 332 (6.5), 333-335, 338 (6.6)
F.LE.5	Interpret the parameters in a linear or exponential function in terms of a context.	*Primary SE/TE:* 298-302 (6.1), 306, 308 (6.2)
Domain: Trigonometric Functions		

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Standard		Pages or Locations Where Standard is Addressed
F.TF.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	*Primary SE/TE:* 469, 471-476 (9.2) *Supporting SE/TE:* 461-468 (9.1), 480-484 (9.3)
F.TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	*Primary SE/TE:* 477-484 (9.3) *Supporting SE/TE:* 461-468 (9.1), 485-494 (9.4), 497-504 (9.5)
F.TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	*Primary SE/TE:* 505-512 (9.6) Supporting SE/TE: 461-468 (9.1)
F.TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	*Primary SE/TE:* 513-515, 517 (9.7) Supporting SE/TE: 461-468 (9.1)
F.TF.9	Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	*Primary SE/TE:* 519-524 (9.8)
Conceptual Category: Geometry		
Domain: Expressing Geometric Properties with Equations		
G.GPE.2	Derive the equation of a parabola given a focus and directrix.	*Primary SE/TE:* 68, 69, 72-74 (2.3)
Conceptual Category: Statistics and Probability		
Domain: Interpreting Categorical and Quantitative Data		
S.ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.	*Primary SE/TE:* 595-602 (11.1)
S.ID.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	
	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.*	*Primary SE/TE:* 21-28 (1.3), 75-82 (2.4) *Supporting SE/TE:* 219-224 (4.9), 341-348 (6.7), 505-512 (9.6)
Domain: Making Inferences and Justifying Conclusions		
S.IC.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	*Primary SE/TE:* 603-608 (11.2), 609-616 (11.3), 619-624 (11.4)
S.IC.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*	*Primary SE/TE:* 625-632 (11.5), 633-638 (11.6) Supporting SE/TE: 603-608 (11.2)
S.IC.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.	*Primary SE/TE:* 609-616 (11.3), 619-624 (11.4)
S.IC.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.	*Primary SE/TE:* 625-632 (11.5)
S.IC.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.	*Primary SE/TE:* 633-638 (11.6)
S.IC.6	Evaluate reports based on data.	*Primary SE/TE:* 619-624 (11.4) *Supporting SE/TE:* 625-632 (11.5), 633-638 (11.6)
Domain: Conditional Probability and the Rules of Probability		

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Standard		Pages or Locations Where Standard is Addressed
S.CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").	*Primary SE/TE:* 537-544 (10.1), 545-552 (10.2), 563-568 (10.4)
S.CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.	*Primary SE/TE:* 545-552 (10.2)
S.CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.	*Primary SE/TE:* 547-552 (10.2) *Supporting SE/TE:* 566, 568 (10.4)
S.CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*	*Primary SE/TE:* 553-560 (10.3)
S.CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. *For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.*	*Primary SE/TE:* 545-552 (10.2), 556-557, 559-560 (10.3)
S.CP.6	Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.	*Primary SE/TE:* 547-549, 551-552 (10.2)
S.CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.	*Primary SE/TE:* 563-568 (10.4) *Supporting SE/TE:* 579-584 (10.6)
S.CP.8	Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B \mid A) = P(B)P(A \mid B)$, and interpret the answer in terms of the model.	*Primary SE/TE:* 545-552 (10.2)
S.CP.9	Use permutations and combinations to compute probabilities of compound events and solve problems.	*Primary SE/TE:* 569-578 (10.5), 579, 582-584 (10.6)
Domain: Using Probability to Make Decisions		
S.MD.6	Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).	*Supporting SE/TE:* 552 (10.2), 557, 559-560 (10.3), 566, 568 (10.4)
S.MD.7	Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).	*Supporting SE/TE:* 552 (10.2), 557, 559-560 (10.3), 566, 568 (10.4)

Big Ideas Math: A Common Core Curriculum Algebra 2 © 2015
Correlated to
Common Core State Standards for High School Algebra 2

	Standard	Pages or Locations Where Standard is Addressed
Mathematical Practices		
Big Ideas Math is a research-based program, systematically developed using the Common Core State Standards for Mathematical Practice as the underlying structure. The Standards for Mathematical Practice are seamlessly connected to the Common Core State Content Standards resulting in a program that maximizes both teacher effectiveness and student understanding. Every section has additional Mathematical Practice support in the Dynamic Classroom and in the online Lesson Plans at *BigIdeasMath.com* .		
1	Make sense of problems and persevere in solving them. Mathematically proficient students: • Explain to themselves the meaning of a problem and looking for entry points to its solution. • Analyze givens, constraints, relationships, and goals • Make conjectures about the form and meaning of the solution attempt. • Plan a solution pathway rather than simply jumping into a solution. • Consider analogous problems and try special cases and simpler forms of the original problen in order to gain insight into its solution. • Monitor and evaluate their progress and change course if necessary. • Transform algebraic expressions or change the viewing window on their graphing calculator to get information. • Explain correspondences between equations, verbal descriptions, tables, and graphs. • Draw diagrams of important features and relationships, graph data, and search for regularity or trends. • Use concrete objects or pictures to help conceptualize and solve a problem. • Check their answers to problems using a different method. • Ask themselves, “Does this make sense?” • Understand the approaches of others to solving complex problems and identify	Each section begins with an Essential Question. Clear step-by-step examples encourage students to plan a solution pathway rather than jumping into a solution attempt. Guided questions and instructional scaffolding support students’ perseverance. ***Sample references:*** Chapter 1, pages 7, 10, 17, 19, 23, 25-29, 36 Chapter 2, pages 51, 52, 54, 55, 60-62, 67, 72, 81-83 Chapter 3, pages 92, 102, 107, 110, 119, 124, 127, 129-131, 138, 143, 144 Chapter 4, pages 161, 163, 164, 179, 183, 186, 187, 190, 202, 209, 224 Chapter 5, pages 258, 269, 274, 283 Chapter 6, pages 306, 315, 316, 323, 333, 339, 348 Chapter 7, pages 362, 369, 373, 381, 388, 391, 399 Chapter 8, pages 419, 427, 431, 446, 449, 450 Chapter 9, pages 465, 466, 473, 484, 493, 497, 502, 503, 511, 517 Chapter 10, pages 544, 551, 563 Chapter 11, pages 635, 638
2	Reason abstractly and quantitively. Mathematically proficient students: • Make sense of quantities and their relationships in problem situations. • Bring two complementary abilities to bear on problems involving quantitative relationships: - Decontextualize (abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents) and - Contextualize (pause as needed during the manipulation process in order to probe into the referents for the symbols involved) • Use quantitative reasoning that entails creating a coherent representation of the problem at hand, considering the units involved, and attending to the meaning of quantities, not just how to compute them . • Know and flexibly use different properties of operations and objects.	Students learn to represent problems by consistently using a verbal model, paying close attention to units and employing mathematical properties. This helps students represent problems symbolically and manipulate the representative symbols. They are taught to contextualize by thinking about the referents and symbols involved. ***Sample references:*** Chapter 1, pages 6, 10, 17, 18, 21, 27, 28, 35, 36 Chapter 2, pages 52, 61, 64, 72, 74 Chapter 3, pages 100-102, 110, 117, 127-130, 137, 145, 146 Chapter 4, pages 161, 164, 171, 172, 185, 196, 224 Chapter 5, pages 242, 258, 281, 283, 284 Chapter 6, pages 298, 316, 317, 323, 324 Chapter 7, pages 358, 359, 372, 382, 390, 398 Chapter 8, pages 417, 424, 431, 432, 450 Chapter 9, pages 460, 468, 469, 476, 483, 493, 503, 504, 512, 517 Chapter 10, pages 543, 545, 552, 560, 576 Chapter 11, pages 602, 603, 605, 607, 609, 615, 616, 625, 632

	Standard	Pages or Locations Where Standard is Addressed
3	Construct viable arguments and critique the reasoning of others. Mathematically proficient students: • Understand and use stated assumptions, definitions, and previously established results in constructing arguments. • Make conjectures and build a logical progression of statements to explore the truth of their conjectures. • Analyze situations by breaking them into cases. • Recognize and use counterexamples. • Justify their conclusions, communicate them to others, and respond to the arguments of others. • Reason inductively about data, making plausible arguments that take into account the context from which the data arose. • Compare the effectiveness of two plausible arguments. • Distinguish correct logic or reasoning from that which is flawed and, if there is a flaw, explain what it is - Elementary students construct arguments using concrete referents such as objects, drawings, diagrams, and actions. - Later students learn to determine domains to which an argument applies. • Listen or read the arguments of others, decide whether they make sense, and ask useful question to clarify or improve arguments.	Throughout the series students are expected to develop models, formulate deductions, and make conjectures. Essential Questions, Error Analysis exercises, and Reasoning exercises provide opportunities for students to make assumptions, examine results, and explain their reasoning. Which One Doesn't Belong and Making an Argument encourage debate and sensemaking. ***Sample references:*** Chapter 1, pages 3, 9, 10, 17, 23, 27, 28, 35, 36 Chapter 2, pages 46, 52-54, 63, 64, 67, 81 Chapter 3, pages 101-103, 109, 110, 117, 118, 129, 130, 138, 145, 146 Chapter 4, pages 157, 162, 164, 171, 172, 178, 183, 184, 186, 194-197, 203, 210, 211, 218, 223, 224 Chapter 5, pages 237, 242, 249, 250, 267, 273-275, 283 Chapter 6, pages 295, 301-303, 308, 309, 315, 317, 323, 324, 327, 331, 332, 339, 346, 348, 349 Chapter 7, pages 363, 364, 372, 373, 375, 382, 383, 389, 390, 397-399 Chapter 8, pages 409, 414-416, 422-424, 432, 435, 439, 440, 448-451 Chapter 9, pages 461, 466-469, 474-476, 483, 484, 494, 504, 511, 512, 517, 518, 524 Chapter 10, pages 542, 544, 552, 560, 561, 563, 567-569, 584, 585 Chapter 11, pages 602, 607, 608, 614, 616, 619, 624, 632, 638

	Standard	Pages or Locations Where Standard is Addressed
4	Model with mathematics. Mathematically proficient students: • Apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. - In early grades, this might be as simple as writing an addition equation to describe a situation. - In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. - By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. • Make assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. • Identify important quantities in a practical situation • Map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. • Analyze those relationships mathematically to draw conclusions. • Interpret their mathematical results in the context of the situation. • Reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	In each section, students work with the mathematics of everyday life. Throughout this series, students use graphs, tables, charts, number lines, diagrams, and formulas to organize, make sense of, and identify realistic solutions to real-life situations. ***Sample references:*** Chapter 1, pages 7-10, 15, 18, 21-23, 26, 27, 34 Chapter 2, pages 51, 53, 60, 62-65, 74, 81, 82 Chapter 3, pages 100-102, 118, 129, 137, 144, 146 Chapter 4, pages 163, 170, 171, 195, 196, 201, 203, 224 Chapter 5, pages 242, 249, 254, 267, 273, 283 Chapter 6, pages 300, 301, 308, 314, 316, 339, 348 Chapter 7, pages 362, 364, 369, 371, 381, 390 Chapter 8, pages 415, 423, 431, 439, 440, 446, 449-451 Chapter 9, pages 465, 467, 473, 475, 483, 484, 491-495, 504, 508, 509, 511 Chapter 10, pages 543, 544, 549, 552-560, 566, 568, 583, 584 Chapter 11, pages 594, 598, 601, 602, 616, 620, 622, 623, 626, 627, 630, 631
5	Use appropriate tools strategically. Mathematically proficient students: • Consider available tools when solving a mathematical problem. (pencil and paper, concrete models, ruler, protractor, calculator, spreadsheet, computer algebra system, statistical package, or dynamic geometry software) • Are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. • Detect possible errors by strategically using estimation and other mathematical knowledge. • Know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. • Identify relevant external mathematical resources and use them to pose or solve problems. • Use technological tools to explore and deepen their understanding of concepts.	Opportunities for students to select and use appropriate tools such as paper and pencil, rulers, protractors, graphing calculators, spreadsheets, dynamic geometry software, websites, and other external resources are provided for students throughout the series. ***Sample references:*** Chapter 1, pages 2, 9, 11, 25, 27 Chapter 2, pages 63, 75, 79, 81 Chapter 3, pages 92, 129, 135, 139, 143, 145 Chapter 4, pages 156, 164, 172, 189, 197, 204, 214, 217, 219, 221, 222 Chapter 5, pages 243, 257, 267, 272, 282, 283 Chapter 6, pages 303, 307, 315, 316, 339, 341, 345, 347, 348 Chapter 7, pages 369, 371, 390, 398 Chapter 8, pages 408, 417, 425, 435, 441, 445 Chapter 9, pages 484, 493, 503, 504, 509, 512 Chapter 10, pages 544, 578 Chapter 11, pages 603, 606, 608, 619, 628, 635, 636, 638

	Standard	Pages or Locations Where Standard is Addressed
6	Attend to Precision. Mathematically proficient students: • Try to communicate precisely to others. - In the elementary grades, students give carefully formulated explanations to each other. - In high school, students have learned to examine claims and make explicit use of definitions. • Try to use clear definitions in discussion with others and in their own reasoning. • State the meaning of the symbols they choose, including using the equal sign consistently and appropriately. • Specify units of measure and label axes to clarify the correspondence with quantities in a problem. • Calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context.	Through the balanced approach to instruction, students have daily opportunities to communicate mathematically. Students work through explorations, examples, and exercises to understand and use the language of mathematics, paying careful attention to the importance of units, labeling, and quantities. ***Sample references:*** Chapter 1, pages 10, 17, 35, 36 Chapter 2, pages 52, 56, 74, 81 Chapter 3, pages 97, 103, 128, 130, 143 Chapter 4, pages 161, 183, 196, 203, 211 Chapter 5, pages 236, 238, 244, 263, 280 Chapter 6, pages 306, 308, 315, 323 Chapter 7, pages 358, 364, 382, 398, 399 Chapter 8, pages 411, 432, 441, 446, 450, 451 Chapter 9, pages 460, 461, 502, 512, 519, 520, 523 Chapter 10, pages 539, 542, 546, 582, 584 Chapter 11, pages 600, 625, 626, 629-632
7	Look for and make use of structure. Mathematically proficient students: • Look closely to discern a pattern or structure. - Young students might notice that three and seven more is the same amount as seven and three more or they may sort a collection of shapes according to how many sides the shapes have. - Later, students will see 7 x 8 equals the well remembered 7 x 5 + 7 x 3, in preparation for the distributive property. - In the expression $x^2 + 9x + 14$, older students can see the 14 as 2 x 7 and the 9 as 2 + 7. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. • Step back for an overview and can shift perspective. • See complicated things, such as some algebraic expressions, as single objects or composed of several objects.	Real and relevant word problems encourage students to “see” that these problems are composed of several components. Students find that some mathematical representations share common mathematical structures and learn to look for these relationships discerning inherent patterns and structures. ***Sample references:*** Chapter 1, pages 3-18, 31 Chapter 2, pages 47-54, 62, 63, 69 Chapter 3, pages 95, 107, 108, 111-118, 128, 140 Chapter 4, pages 163, 165-172, 179-186, 205-210 Chapter 5, pages 251-258, 261 Chapter 6, pages 305, 317-324, 335, 344 Chapter 7, pages 362, 365-372 Chapter 8, pages 416, 448 Chapter 9, pages 485-494, 497-504, 516-518 Chapter 10, pages 537, 558, 579

Standard		Pages or Locations Where Standard is Addressed
8	Look for and express regularity in repeated reasoning. Mathematically proficient students: • Notice if calculations are repeated. • Look both for general methods and for shortcuts. - Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeated decimal. - Paying attention to the calculation of slope as they repeatedly check whether the points are on the line through (1,2) with a slope 3, middle school students might abstract the equation (y-2)/(x-1)=3. - Noticing the regularity in the way terms cancel when expanding (x-1)(x+1), $(x-1)(x^2+x+1)$, and $(x-1)(x^3+x^2+x+1)$ might lead high school students to the general formula for the sum of a geometric series. • Maintain oversight of the process of solving a problem, while attending to the details. • Continually evaluate the reasonableness of intermediate results.	The series helps students see that mathematics is well structured and predictable. Students work through a problem, not through the numbers. They consider factors such as an appropriate answer to the question, reasonable intermediate steps, and a realistic solution using the four-step problem solving plan. ***Sample references:*** Chapter 1, pages 15, 23, 35 Chapter 2, pages 55, 60, 74, 82, 83 Chapter 3, pages 115, 143 Chapter 4, pages 175, 187, 191, 198 Chapter 5, pages 242, 340 Chapter 6, pages 294, 306 Chapter 7, pages 362, 369 Chapter 8, pages 425, 432, 440, 446 Chapter 9, page 473 Chapter 10, page 568