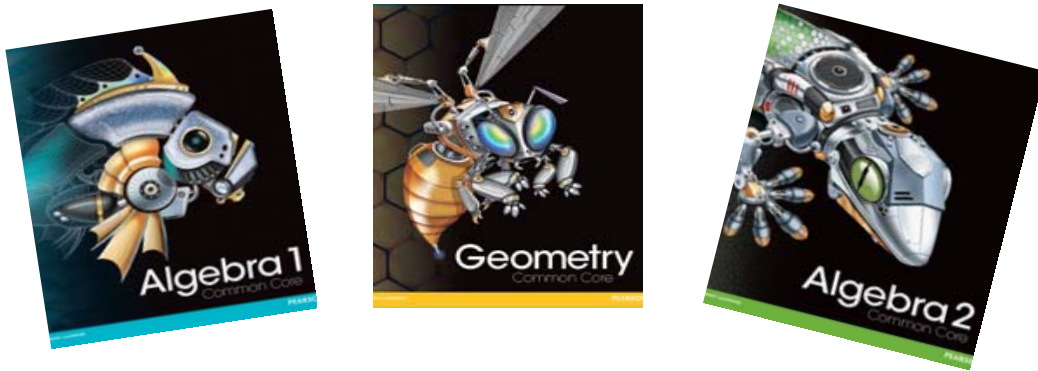


A Correlation of
Pearson
Algebra 1, Geometry, and Algebra 2
Common Core
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to the
Common Core State Standards
Comparison with
Arkansas
Student Learning Expectations
for Mathematics
Grades 9-12

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Common Core State Standards for Mathematics	Arkansas Student Learning Expectations for Mathematics	Pearson Algebra 1, Geometry, Algebra 2, Common Core ©2012
Number and Quantity		
<p>CC.9-12.N.RN.1 Extend the properties of exponents to rational exponents. 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 $[5^{(1/3)}]^3 = 5^{[(1/3) \times 3]}$ to hold, so $[5^{(1/3)}]^3$ must equal 5.</p>	<p>AR.9-12.PRF.AII.4.7 (PRF.4.AII.7) Establish the relationship between radical expressions and expressions containing rational exponents</p>	<p>Algebra 1: SE/TE: 448-452 TE: 452A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 631-366, 381-388 TE: 366A Lesson Resources</p>
	<p>AR.9-12.PRF.AII.4.8 (PRF.4.AII.8) Simplify variable expressions containing rational exponents using the laws of exponents</p>	<p>Algebra 1: SE/TE: 425-431 TE: 431 Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 363, 368-370, 376</p>
	<p>AR.9-12.QEF.AII.3.1 (QEF.3.AII.1) Perform computations with radicals: -- simplify radicals with different indices, -- add, subtract, multiply and divide radicals, -- rationalize denominators, -- solve equations that contain radicals or radical expressions</p>	<p>Algebra 1: SE/TE: 448-452, 619-625, 626-631, 633-638 TE: 625A Lesson Resources, 638A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 361-368, 367-373, 374-380, 381-388, 390-396</p>
	<p>AR.9-12.LA.AI.1.8 (LA.1.AI.8) Simplify radical expressions such as $3 / (\sqrt{7})$.</p>	<p>Algebra 1: SE/TE: 619-624</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 369-370, 377</p>

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Common Core State Standards for Mathematics	Arkansas Student Learning Expectations for Mathematics	Pearson Algebra 1, Geometry, Algebra 2, Common Core ©2012
<p>(Continued) CC.9-12.N.RN.1 Extend the properties of exponents to rational exponents. 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 $[5^{(1/3)}]^3 = 5^{[(1/3) \times 3]}$ to hold, so $[5^{(1/3)}]^3$ must equal 5.</p>	<p>AR.9-12.PRF.AIII.2.5 (PRF.2.AIII.5) Establish the relationship between radical expressions and expressions containing rational exponents, and simplify variable expressions containing rational exponents using the laws of exponents</p>	<p>Algebra 1: SE/TE: 633-638, 639-644 TE: 638A Lesson Resources, 644A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 361-366, 368-370, 376, 381-388 TE: 366A Lesson Resources</p>
<p>CC.9-12.N.RN.2 Extend the properties of exponents to rational exponents. Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>	<p>AR.9-12.PRF.AII.4.7 (PRF.4.AII.7) Establish the relationship between radical expressions and expressions containing rational exponents</p>	<p>Algebra 1: SE/TE: 448-452; TE: 452A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 631-366, 381-388 TE: 366A Lesson Resources</p>
	<p>AR.9-12.PRF.AII.4.8 (PRF.4.AII.8) Simplify variable expressions containing rational exponents using the laws of exponents</p>	<p>Algebra 1: SE/TE: 433-438, 439-443</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 363, 368-370, 376</p>

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<p>(Continued) CC.9-12.N.RN.2 Extend the properties of exponents to rational exponents. Rewrite expressions involving radicals and rational exponents using the properties of exponents.</p>	<p>AR.9-12.QEF.AII.3.1 (QEF.3.AII.1) Perform computations with radicals: -- simplify radicals with different indices, -- add, subtract, multiply and divide radicals, -- rationalize denominators, -- solve equations that contain radicals or radical expressions</p>	<p>Algebra 1: SE/TE: 448-452, 619-625, 626-631, 633-638 TE: 625A Lesson Resources, 638A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 361-368, 367-373, 374-380, 381-388, 390-396</p>
	<p>AR.9-12.LA.AI.1.9 (LA.1.AI.9) Add, subtract, and multiply simple radical expressions like $3\sqrt{20} + 7\sqrt{5}$ and $(4\sqrt{5})(2\sqrt{3})$.</p>	<p>Algebra 1: SE/TE: 619-625, 626-631 TE: 625A Lesson Resources, 631A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 367-368, 374-376</p>
	<p>AR.9-12.PRF.AIII.2.5 (PRF.2.AIII.5) Establish the relationship between radical expressions and expressions containing rational exponents, and simplify variable expressions containing rational exponents using the laws of exponents</p>	<p>Algebra 1: SE/TE: 633-638, 639-644 TE: 638A Lesson Resources, 644A Lesson Resources</p> <p>Geometry: SE/TE: 399</p> <p>Algebra 2: SE/TE: 361-366, 368-370, 376, 381-388 TE: 366A Lesson Resources</p>
<p>CC.9-12.N.RN.3 Use Properties of rational and irrational numbers. 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 number and an irrational number is irrational.</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Studied in 4th year course.</p>

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<p>CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. 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.*</p>	<p>AR.9-12.DIP.AI.5.5 (DIP.5.AI.5) Use two or more graphs (i.e., box-and-whisker, histograms, scatter plots) to compare data sets</p>	<p>Algebra 1: SE/TE: 746-751, 732-737, 336-343 TE: 751A Lesson Resources/ Histograms, 737A Lesson Resources, 343A Lesson Resources</p> <p>Algebra 2: SE/TE: 92-98, 713-714 TE: 98A Lesson Resources</p>
	<p>AR.9-12.DIP.AI.5.6 (DIP.5.AI.6) Construct and interpret a cumulative frequency histogram in real life situations</p>	<p>Algebra 1: SE/TE: 732-737 TE: 737A Lesson Resources</p> <p>Algebra 2: SE/TE: 695</p>
	<p>AR.9-12.DIP.AI.5.1 (DIP.5.AI.1) Construct and use scatter plots and line of best fit to make inferences in real life situations</p>	<p>Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources</p> <p>Algebra 2: SE/TE: 92-98, 713-714 TE: 98A Lesson Resources</p>
	<p>AR.9-12.SEI.AI.2.5 (SEI.2.AI.5) Solve real world problems that involve a combination of rates, proportions and percents</p>	<p>Algebra 1: SE/TE: 116-121, 137-143 TE: 121A Lesson Resources, 143A Lesson Resources</p> <p>Geometry: SE/TE: 432-435, 443,446 TE: 438A</p>
	<p>AR.9-12.SEI.AI.2.6 (SEI.2.AI.6) Solve problems involving direct variation and indirect (inverse) variation to model rates of change</p>	<p>Algebra 1: SE/TE: 698-704 TE: 704A Lesson Resources</p> <p>Algebra 2: SE/TE: 68-72, 498-504 TE: 73A Lesson Resources, 505A Lesson Resources</p>

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<p>(Continued) CC.9-12.N.Q.1 Reason quantitatively and use units to solve problems. 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.*</p>	<p>AR.9-12.LF.AI.3.5 (LF.3.AI.5) Interpret the rate of change/slope and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300 TE: 300A Lesson Resources</p> <p>Geometry: SE/TE: 189-195</p> <p>Algebra 2: SE/TE: 70, 501-502, 504</p>
	<p>AR.9-12.M.G.3.2 (M.3.G.2) Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms</p>	<p>Algebra 1: SE/TE: 110</p> <p>Geometry: SE/TE: 699-707 TE: 707A Lesson Resources, 708-715, 715A Lesson Resources, 717-724, 724A Lesson Resources, 726-732, 732A Lesson Resources, 733-740, 740A Lesson Resources, 742-749, 749A Lesson Resources</p>
	<p>AR.9-12.PS.AC.1.5 (PS.1.AC.5) Interpret and evaluate, with and without appropriate technology, graphical and tabular data displays for: -- consistency with the data, -- appropriateness of type of graph or data display, -- scale, -- overall message</p>	<p>Algebra 1: SE/TE: 726-731, 732-737, 738-744, 746-751, 753-759 TE: 731A Lesson Resources, 737A Lesson Resources, 744A Lesson Resources, 751A Lesson Resources, 759A Lesson Resources</p> <p>Geometry: SE/TE: 83, 111-112, 658, 660, 748</p> <p>Algebra 2: SE/TE: 711-718 TE: 718A Lesson Resources</p>
	<p>AR.9-12.ME.TDM.3.1 (ME.3.TDM.1) Solve problems using dimensional analysis (factor-label method) (e.g., construction, medical, metric, standard to metric, rate conversions)</p>	<p>Algebra 1: SE/TE: 116-121 TE: 121A Lesson Resources</p> <p>Geometry: SE/TE: T886</p> <p>Algebra 2: SE/TE: 845</p>

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<p>CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.*</p>	<p>AR.9-12.M.G.3.2 (M.3.G.2) Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms</p>	<p>Algebra 1: SE/TE: 110</p> <p>Geometry: SE/TE: 699-707, 708-715, 717-724, 11-5 726-732, 733-740, 742-749 TE: 707A Lesson Resources, 715A Lesson Resources, 724A Lesson Resources, 732A Lesson Resources, 740A Lesson Resources, 749A Lesson Resources</p>
	<p>AR.9-12.SEI.AI.2.5 (SEI.2.AI.5) Solve real world problems that involve a combination of rates, proportions and percents</p>	<p>Algebra 1: SE/TE: Rates 116-121, 137-143 TE: 121A Lesson Resources</p> <p>Geometry: SE/TE: 432-435, 443,446</p>
	<p>AR.9-12.SEI.AI.2.6 (SEI.2.AI.6) Solve problems involving direct variation and indirect (inverse) variation to model rates of change</p>	<p>Algebra 1: SE/TE: 698-704 TE: 704A Lesson Resources</p> <p>Algebra 2: SE/TE: 68-72, 498-504, TE: 73A Lesson Resources, 505A Lesson Resources</p>
	<p>AR.9-12.SEI.AC.3.6 (SEI.3.AC.6) SLE 6. Apply linear, piece-wise and step functions to real world situations that involve a combination of rates, proportions and percents such as sales tax, simple interest, social security, constant depreciation and appreciation, arithmetic sequences, constant rate of change, income taxes, postage, utility bills, commission, and traffic tickets</p>	<p>Algebra 1: SE/TE: 8, 169, 249-242, 348,462</p> <p>Algebra 2: SE/TE: 64, 84, 90-91, 576</p>

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<p>(Continued) CC.9-12.N.Q.2 Reason quantitatively and use units to solve problems. Define appropriate quantities for the purpose of descriptive modeling.*</p>	<p>AR.9-12.ME.TDM.3.1 (ME.3.TDM.1) Solve problems using dimensional analysis (factor-label method) (e.g., construction, medical, metric, standard to metric, rate conversions)</p>	<p>Algebra 1: SE/TE: 116-121 TE: 121A Lesson Resources</p> <p>Geometry: SE/TE: 62 TE: T886</p> <p>Algebra 2: SE/TE: 845</p>
<p>CC.9-12.N.Q.3 Reason quantitatively and use units to solve problems. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*</p>	<p>AR.9-12.M.G.3.2 (M.3.G.2) Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms</p>	<p>Algebra 1: SE/TE: 110</p> <p>Geometry: SE/TE: 699-707, 708-715, 717-724, 726-732, 733-740, 742-749 TE: 707A Lesson Resources, 715A Lesson Resources, 724A Lesson Resources, 732A Lesson Resources, 740A Lesson Resources, 749A Lesson Resources</p>
<p>CC.9-12.N.CN.1 Perform arithmetic operations with complex numbers. 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.</p>	<p>AR.9-12.QEF.AII.3.2 (QEF.3.AII.2) Extend the number system to include the complex numbers: -- define the set of complex numbers, -- add, subtract, multiply, and divide complex numbers, -- rationalize denominators</p>	<p>Algebra 2: SE/TE: 248-252 TE: 255A Lesson Resources</p>
<p>CC.9-12.N.CN.2 Perform arithmetic operations with complex numbers. Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.</p>	<p>AR.9-12.QEF.AII.3.2 (QEF.3.AII.2) Extend the number system to include the complex numbers: -- define the set of complex numbers, -- add, subtract, multiply, and divide complex numbers, -- rationalize denominators</p>	<p>Algebra 2: SE/TE: 248-252 TE: 255A Lesson Resources</p>

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CC.9-12.N.CN.3 (+) Perform arithmetic operations with complex numbers. Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	AR.9-12.QEF.AII.3.2 (QEF.3.AII.2) Extend the number system to include the complex numbers: -- define the set of complex numbers, -- add, subtract, multiply, and divide complex numbers, -- rationalize denominators	Algebra 2: SE/TE: 248-252 TE: 255A Lesson Resources
CC.9-12.N.CN.4 (+) Represent complex numbers and their operations on the complex plane. Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	AR.9-12.PC.PCT.8.1 (PC.8.PCT.1) Convert polar coordinates to rectangular coordinates and rectangular coordinates to polar coordinates	Studied in a 4th year course.
	AR.9-12.PC.PCT.8.2 (PC.8.PCT.2) Represent equations given in rectangular coordinates in terms of polar coordinates	Studied in a 4th year course.
	AR.9-12.PC.PCT.8.3 (PC.8.PCT.3) Graph polar equations and use appropriate technology when needed	Studied in a 4th year course.
	AR.9-12.PC.PCT.8.4 (PC.8.PCT.4) Apply polar coordinates to real world situations and use appropriate technology when needed	Studied in a 4th year course.
CC.9-12.N.CN.5 (+) Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, $(-1 + \sqrt{3}i)^3 = 8$ because $(-1 + \sqrt{3}i)$ has modulus 2 and argument 120° .	No Matches in Arkansas Frameworks	Algebra 2: SE/TE: 248-252 TE: 255A Lesson Resources

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<p>CC.9-12.N.CN.6 (+) Calculate the distance between numbers in the complex plane as the modulus of the difference, and of the midpoint of a segment as the average of the numbers at its midpoint.</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Algebra 2: SE/TE: 248-254 TE: 255A Lesson Resources</p>
<p>CC.9-12.N.CN.7 Use complex numbers in polynomial identities and equations. Solve quadratic equations with real coefficients that have complex solutions.</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 2: SE/TE: 319-322 TE: 324A Lesson Resources</p>
<p>CC.9-12.N.CN.8 (+) Use complex numbers in polynomial identities and equations. Extend polynomial identities to the complex numbers. For example, rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$.</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 2: SE/TE: 319-322 TE: 324A Lesson Resources</p>

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<p>CC.9-12.N.CN.9 (+) Use complex numbers in polynomial identities and equations. Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.</p>	<p>AR.9-12.PRF.AII.4.1 (PRF.4.AII.1) Determine the factors of polynomials by: -- using factoring techniques including grouping and the sum or difference of two cubes, -- using long division, -- using synthetic division</p>	<p>Algebra 2: SE/TE: 319-322 TE: 324A Lesson Resources</p>
	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 2: SE/TE: 319-322 TE: 324A Lesson Resources</p>
	<p>AR.9-12.PRF.AIII.2.1 (PRF.2.AIII.1) Determine the factors of polynomials by: -- using factoring techniques including grouping, the difference of two squares, and the sum or difference of two cubes, -- using synthetic division</p>	<p>Algebra 2: SE/TE: 319-322 TE: 324A Lesson Resources</p>

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<p>CC.9-12.N.VM.1 (+) Represent and model with vector quantities. Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., \mathbf{v}, v, v, v (not bold)).</p>	<p>AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
	<p>AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
<p>CC.9-12.N.VM.2 (+) Represent and model with vector quantities. Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.</p>	<p>AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
<p>CC.9-12.N.VM.3 (+) Represent and model with vector quantities. Solve problems involving velocity and other quantities that can be represented by vectors.</p>	<p>AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
	<p>AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>

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CC.9-12.N.VM.4 (+) Perform operations on vectors. Add and subtract vectors.	AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources
	AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources
CC.9-12.N.VM.4a (+) Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.	AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources
	AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources

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<p>CC.9-12.N.VM.4b (+) Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.</p>	<p>AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
	<p>AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
<p>CC.9-12.N.VM.4c (+) Understand vector subtraction $v - w$ as $v + (-w)$, where $(-w)$ is the additive inverse of w, with the same magnitude as w and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.</p>	<p>AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>
	<p>AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources</p>

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CC.9-12.N.VM.5 (+) Perform operations on vectors. Multiply a vector by a scalar.	AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources
	AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources
CC.9-12.N.VM.5a (+) Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$.	AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically	Algebra 2: SE/TE: 809-815 TE: 815A Lesson Resources
CC.9-12.N.VM.5b (+) Compute the magnitude of a scalar multiple cv using $cv = c v$. Compute the direction of cv knowing that when $c v \neq 0$, the direction of cv is either along v (for $c > 0$) or against v (for $c < 0$).	AR.9-12.OT.PCT.6.5 (OT.6.PCT.5) Use vectors to model situations defined by magnitude and direction and analyze and solve real world problems by using appropriate technology when needed	Algebra 2: SE/TE: 814-815

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CC.9-12.N.VM.6 (+) Perform operations on matrices and use matrices in applications. Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.	AR.9-12.LEI.AII.2.3 (LEI.2.AII.3) Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)	Algebra 1: SE/TE: 726-731 TE: 731A Lesson Resources Algebra 2: SE/TE: 764-770, 772-776, 782-787, 792-796 TE: 770A Lesson Resources, 779A Lesson Resources, 790A Lesson Resources, 800A Lesson Resources
	AR.9-12.DIP.AI.5.3 (DIP.5.A1.3) Construct simple matrices for real life situations	Algebra 1: SE/TE: 728-730 Algebra 2: SE/TE: 769, 778
	AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making	Algebra 2: SE/TE: 771
	AR.9-12.MA.TDM.1.1 (MA.1.TDM.1) Collect and interpret data in a matrix and perform operations to solve real-world problems, with and without technology	Algebra 1: SE/TE: 726-731 TE: 731A Lesson Resources Algebra 2: SE/TE: 780, 787

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<p>CC.9-12.N.VM.7 (+) Perform operations on matrices and use matrices in applications. Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.</p>	<p>AR.9-12.LEI.AII.2.3 (LEI.2.AII.3) Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)</p>	<p>Algebra 1: SE/TE: 726-731 TE: 731A Lesson Resources</p> <p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>
	<p>AR.9-12.DIP.AI.5.2 (DIP.5.AI.2) Use simple matrices in addition, subtraction, and scalar multiplication</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>
	<p>AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making</p>	<p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>
	<p>AR.9-12.MA.TDM.1.1 (MA.1.TDM.1) Collect and interpret data in a matrix and perform operations to solve real-world problems, with and without technology</p>	<p>Algebra 1: SE/TE: 726-731 TE: 731A Lesson Resources</p> <p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>

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<p>CC.9-12.N.VM.8 (+) Perform operations on matrices and use matrices in applications. Add, subtract, and multiply matrices of appropriate dimensions.</p>	<p>AR.9-12.LEI.AII.2.3 (LEI.2.AII.3) Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>
	<p>AR.9-12.DIP.AI.5.2 (DIP.5.AI.2) Use simple matrices in addition, subtraction, and scalar multiplication</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>
	<p>AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making</p>	<p>Algebra 2: SE/TE: 769, 771, 778</p>
<p>CC.9-12.N.VM.9 (+) Perform operations on matrices and use matrices in applications. Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.</p>	<p>AR.9-12.LEI.AII.2.3 (LEI.2.AII.3) Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 769, 771, 778</p>
	<p>AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 769, 771, 778</p>

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<p>CC.9-12.N.VM.10 (+) Perform operations on matrices and use matrices in applications. Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.</p>	<p>AR.9-12.LEI.AII.2.3 (LEI.2.AII.3) Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 764-770; 772-776; 782-787; 792-796</p>
	<p>AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 769, 771, 778, 787, 790</p>
	<p>AR.9-12.MA.TDM.1.3 (MA.1.TDM.3) Find and use the inverse of a matrix to solve real-world problems (e.g., cryptology)</p>	<p>Algebra 1: SE/TE: 726-731</p> <p>Algebra 2: SE/TE: 785, 787, 796</p>
<p>CC.9-12.N.VM.11 (+) Perform operations on matrices and use matrices in applications. Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.</p>	<p>AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making</p>	<p>Algebra 2: SE/TE: 769, 771, 778, 796</p>
	<p>AR.9-12.OT.PCT.6.4 (OT.6.PCT.4) Use vectors to solve problems and describe addition of vectors and multiplication of a vector by a scalar, both symbolically and geometrically</p>	<p>Algebra 2: SE/TE: 810</p>

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<p>CC.9-12.N.VM.12 (+) Perform operations on matrices and use matrices in applications. Work with 2 X 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.</p>	<p>AR.9-12.MM.TM.3.2 (MM.3.TM.2) Apply, with appropriate technology, matrices to real world problems and decision making</p>	<p>Algebra 2: SE/TE: 769, 771, 778, 787, 796</p>
Algebra		
<p>CC.9-12.A.SSE.1 Interpret the structure of expressions. Interpret expressions that represent a quantity in terms of its context.*</p>	<p>AR.9-12.LA.AI.1.2 (LA.1.AI.2) Translate word phrases and sentences into expressions, equations, and inequalities, and vice versa</p>	<p>Algebra 1: SE/TE: 171-175, 178-183 308-314, 315-320, 322-328 TE: 177A Lesson Resources, 183A Lesson Resources, 314A Lesson Resources, 320A Lesson Resources, 328A Lesson Resources</p> <p>Algebra 2: SE/TE: 18-20, 28, 31, 33-37</p>
<p>CC.9-12.A.SSE.1a Interpret parts of an expression, such as terms, factors, and coefficients.*</p>	<p>AR.9-12.LA.AI.1.2 (LA.1.AI.2) Translate word phrases and sentences into expressions, equations, and inequalities, and vice versa</p>	<p>Algebra 1: SE/TE: 171-175, 178-183,3 08-314, 315-320, 322-328 TE: 177A Lesson Resources, 183A Lesson Resources, 314A Lesson Resources, 320A Lesson Resources, 328A Lesson Resources</p> <p>Algebra 2: SE/TE: 18-20, 28, 31, 33-37</p>
<p>CC.9-12.A.SSE.1b 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.*</p>	<p>AR.9-12.RF.AII.1.4 (RF.1.AII.4) Analyze and report, with and without appropriate technology, the effect of changing coefficients, exponents, and other parameters on functions and their graphs (linear, quadratic, and higher degree polynomial)</p>	<p>Algebra 1: SE/TE: 242, 246-247, 308-313, 546-551, 553-558, 675 TE: 313A Lesson Resources, 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 99-100, 194-198, 339-341</p>

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<p>CC.9-12.A.SSE.2 Interpret the structure of expressions. 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 $(x^2 - y^2)(x^2 + y^2)$.</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by:</p> <ul style="list-style-type: none"> -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula 	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Geometry: SE/TE: TE: 439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources</p>
	<p>AR.9-12.NLF.AI.4.1 (NLF.4.AI.1) Factoring polynomials:</p> <ul style="list-style-type: none"> -- greatest common factor, -- binomials (difference of squares), -- trinomials 	<p>Algebra 1: SE/TE: 492-496, 512-517, 518-522, 523-528, 529-533 TE: 496A Lesson Resources, 517A Lesson Resources, 522A Lesson Resources, 528A Lesson Resources, 533A Lesson Resources</p> <p>Algebra 2: SE/TE: 218, 297</p>
	<p>AR.9-12.NF.AC.4.1 (NF.4.AC.1) Factor polynomials:</p> <ul style="list-style-type: none"> -- greatest common factor, -- binomials (difference of squares), -- trinomials, -- combinations of the above 	<p>Algebra 1: SE/TE: 492-496, 512-517, 518-522, 523-528, 529-533 TE: 496A Lesson Resources, 517A Lesson Resources, 522A Lesson Resources, 528A Lesson Resources, 533A Lesson Resources</p> <p>Algebra 2: SE/TE: 218-220, 234-235, 297-301</p>

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<p>CC.9-12.A.SSE.3 Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Geometry: SE/TE: TE: 439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A</p>
	<p>AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology: -- factoring, -- quadratic formula with real number solutions</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247</p>
	<p>AR.9-12.NF.AC.4.3 (NF.4.AC.3) Solve, with and without appropriate technology, quadratic equations with real number solutions using factoring and the quadratic formula</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 226-230, 240-244 TE: 231A, 247A Lesson Resources</p>

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<p>(Continued) CC.9-12.A.SSE.3 Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*</p>	<p>AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically</p>	<p>Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 194-201, 203-204, 209-211, 232, 242-243, 268</p>
	<p>AR.9-12.PRF.AII.4.8 (PRF.4.AII.8) Simplify variable expressions containing rational exponents using the laws of exponents</p>	<p>Algebra 1: SE/TE: 433-438, 439-443</p> <p>Algebra 2: SE/TE: 360, 381-388, 424</p>
<p>CC.9-12.A.SSE.3 Write expressions in equivalent forms to solve problems. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.*</p>	<p>AR.9-12.F.TFM.5.2 (F.5.TFM.2) Apply properties of logarithms to convert and solve logarithmic (common and natural) and exponential equations</p>	<p>Algebra 2: SE/TE: 462-467, 469-475, 478-481, 489</p>

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<p>CC.9-12.A.SSE.3a Factor a quadratic expression to reveal the zeros of the function it defines.*</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by:</p> <ul style="list-style-type: none"> -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula 	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Geometry: SE/TE: TE:439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A</p>
	<p>AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology:</p> <ul style="list-style-type: none"> -- factoring, -- quadratic formula with real number solutions 	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247</p>
	<p>AR.9-12.NF.AC.4.3 (NF.4.AC.3) Solve, with and without appropriate technology, quadratic equations with real number solutions using factoring and the quadratic formula</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 226-230, 240-244 TE: 231A, 247A Lesson Resources</p>

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<p>CC.9-12.A.SSE.3b Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.*</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Geometry: SE/TE: TE: 439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources</p>
	<p>AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology: -- factoring, -- quadratic formula with real number solutions</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247</p>
	<p>AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically</p>	<p>Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 194-201, 203-204, 209-211, 232, 242-243, 268, 290</p>

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<p>CC.9-12.A.SSE.3c 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%.*</p>	<p>AR.9-12.PRF.AII.4.8 (PRF.4.AII.8) Simplify variable expressions containing rational exponents using the laws of exponents</p>	<p>Algebra 1: SE/TE: 433-438, 439-443</p> <p>Algebra 2: SE/TE: 360, 381-388, 424</p>
	<p>AR.9-12.F.TFM.5.2 (F.5.TFM.2) Apply properties of logarithms to convert and solve logarithmic (common and natural) and exponential equations</p>	<p>Algebra 2: SE/TE: 462-467, 469-475, 468-481, 489</p>
<p>CC.9-12.A.SSE.4 Write expressions in equivalent forms to solve problems. 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.*</p>	<p>AR.9-12.SS.PCT.4.2 (SS.4.PCT.2) Define and discriminate between arithmetic and geometric sequences and series and use appropriate technology when needed</p>	<p>Algebra 1: SE/TE: 274-281, 467-472 TE: 281A Lesson Resources, 472A Lesson Resources</p> <p>Algebra 2: SE/TE: 572-577, 580-586, 587-592, 595-600 TE: 577A, 586A, 593A, 601A Lesson Resources</p>
	<p>AR.9-12.SS.PCT.4.3 (SS.4.PCT.3) Solve, with and without appropriate technology, problems involving the sum (including Sigma notation) of finite and infinite sequences and series</p>	<p>Algebra 2: SE/TE: 572-577, 580-586, 587-592, 595-600 TE: 577A, 586A, 593A, 601A Lesson Resources</p>
	<p>AR.9-12.F.TFM.5.3 (F.5.TFM.3) Solve real-world problems involving:</p> <ul style="list-style-type: none"> -- compound interest, -- amortization, -- annuities, -- appreciation, -- depreciation, -- investments 	<p>Algebra 2: SE/TE: 436-437, 447-449</p>

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<p>CC.9-12.A.APR.1 Perform arithmetic operations on polynomials. 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.</p>	<p>AR.9-12.LA.AI.1.5 (LA.1.AI.5) Perform polynomial operations (addition, subtraction, multiplication) with and without manipulatives</p>	<p>Algebra 1: SE/TE: 486-491, 492-496, 498-503 TE: 491A Lesson Resources, 496A Lesson Resources, 508A Lesson Resources</p> <p>Algebra 2: SE/TE: 398-399</p>
	<p>AR.9-12.RF.AII.1.2 (RF.1.AII.2) Evaluate, add, subtract, multiply, and divide functions and give appropriate domain and range restrictions</p>	<p>Algebra 1: SE/TE: 268-271</p> <p>Algebra 2: SE/TE: 398-399, 408, 414, 434, 435, 515-516</p>
<p>CC.9-12.A.APR.2 Understand the relationship between zeros and factors of polynomial. 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 $p(x)$.</p>	<p>AR.9-12.PRF.AII.4.1 (PRF.4.AII.1) Determine the factors of polynomials by: -- using factoring techniques including grouping and the sum or difference of two cubes, -- using long division, -- using synthetic division</p>	<p>Algebra 2: SE/TE: 396-399, 303-310</p>
	<p>AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology: -- factoring, -- quadratic formula with real number solutions</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247 TE: 223A, 239A, 247A Lesson Resources</p>
	<p>AR.9-12.NF.AC.4.1 (NF.4.AC.1) Factor polynomials: -- greatest common factor, -- binomials (difference of squares), -- trinomials, -- combinations of the above</p>	<p>Algebra 1: SE/TE: 492-496, 512-517, 518-522, 523-528, 529-533 TE: 496A Lesson Resources, 517A Lesson Resources, 522A Lesson Resources, 528A Lesson Resources, 533A Lesson Resources</p> <p>Algebra 2: SE/TE: 218, 297</p>

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<p>(Continued) CC.9-12.A.APR.2 Understand the relationship between zeros and factors of polynomial. 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 $p(x)$.</p>	<p>AR.9-12.PRF.PCT.1.2 (PRF.1.PCT.2) Solve, with and without appropriate technology, polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, Intermediate Value Theorem and Rational Root Theorem</p>	<p>Algebra 2: SE/TE: 315</p>
	<p>AR.9-12.PRF.AIII.2.1 (PRF.2.AIII.1) Determine the factors of polynomials by: -- using factoring techniques including grouping, the difference of two squares, and the sum or difference of two cubes, -- using synthetic division</p>	<p>Algebra 1: SE/TE: 523-528, 529-533 TE: 528A Lesson Resources, 533A Lesson Resources</p> <p>Algebra 2: SE/TE: 396-399, 303-310</p>
<p>CC.9-12.A.APR.3 Understand the relationship between zeros and factors of polynomials. 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.</p>	<p>AR.9-12.PRF.AII.4.2 (PRF.4.AII.2) Analyze and sketch, with and without appropriate technology, the graph of a given polynomial function, determining the characteristics of domain and range, maximum and minimum points, end behavior, zeros, multiplicity of zeros, y-intercept, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 76, 107, 194-196, 268, 291, 292, 622</p>
	<p>AR.9-12.NLF.AI.4.2 (NLF.4.AI.2) Determine minimum, maximum, vertex, and zeros, given the graph</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 194-196, 290-292</p>

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<p>(Continued) CC.9-12.A.APR.3 Understand the relationship between zeros and factors of polynomials. 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.</p>	<p>AR.9-12.PRF.PCT.1.2 (PRF.1.PCT.2) Solve, with and without appropriate technology, polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, Intermediate Value Theorem and Rational Root Theorem</p>	<p>Algebra 2: SE/TE: 315</p>
	<p>AR.9-12.PRF.AIII.2.6 (PRF.2.AIII.6) Apply, with and without appropriate technology, the concepts of polynomial and rational functions to model real world situations</p>	<p>Algebra 1: SE/TE: 551, 552, 565, 570, 571</p> <p>Algebra 2: SE/TE: 286, 287, 294, 323</p>
<p>CC.9-12.A.APR.4 Use polynomial identities to solve problems. 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.</p>	<p>AR.9-12.NLF.AI.4.1 (NLF.4.AI.1) Factoring polynomials: -- greatest common factor, -- binomials (difference of squares), -- trinomials</p>	<p>Algebra 1: SE/TE: 492-496, 512-517, 518-522, 523-528, 529-533 TE: 496A Lesson Resources, 517A Lesson Resources, 522A Lesson Resources, 528A Lesson Resources, 533A Lesson Resources</p> <p>Algebra 2: SE/TE: 218, 297</p>
	<p>AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology: -- factoring, -- quadratic formula with real number solutions</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247 TE: 223A, 239A, 247A Lesson Resources</p>
<p>(Continued) CC.9-12.A.APR.4 Use polynomial identities to solve problems. 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.</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247 TE: 223A, 239A, 247A Lesson Resources</p>

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	AR.9-12.PRF.AIII.2.1 (PRF.2.AIII.1) Determine the factors of polynomials by: -- using factoring techniques including grouping, the difference of two squares, and the sum or difference of two cubes, -- using synthetic division	Algebra 2: SE/TE: 396-399, 303-310
CC.9-12.A.APR.5 (+) Use polynomial identities to solve problems. Know and apply that the Binomial Theorem gives 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. (The Binomial Theorem can be proved by mathematical induction or by a combinatorial argument.)	AR.9-12.CT.TFM.3.6 (CT.3.TFM.6) Construct and examine Pascal's triangle	Algebra 2: SE/TE: 326-329 TE: 330A Lesson Resources
	AR.9-12.CT.TFM.3.7 (CT.3.TFM.7) Develop and use the binomial theorem	Algebra 2: SE/TE: 326-329 TE: 330A Lesson Resources
	AR.9-12.CT.TFM.3.8 (CT.3.TFM.8) Use combinations to find a specified term in a binomial expansion	Algebra 2: SE/TE: 733
CC.9-12.A.APR.6 Rewrite rational expressions. 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.	AR.9-12.PRF.AII.4.1 (PRF.4.AII.1) Determine the factors of polynomials by: -- using factoring techniques including grouping and the sum or difference of two cubes, -- using long division, -- using synthetic division	Algebra 1: SE/TE: 664-668, 670-675, 679-680 Algebra 2: SE/TE: 319-322 TE: 324A Lesson Resources
	AR.9-12.PRF.AIII.2.3 (PRF.2.AIII.3) Simplify, add, subtract, multiply, and divide with rational expressions	Algebra 1: SE/TE: 670-674, 684-689 Algebra 2: SE/TE: 535, 536-540, 528-532
CC.9-12.A.APR.7 (+) Rewrite rational expressions. Understand that rational expressions form a system analogous to the rational	AR.9-12.PRF.AII.4.6 (PRF.4.AII.6) Simplify, add, subtract, multiply, and divide with rational expressions	Algebra 1: SE/TE: 670-674, 684-689 Algebra 2: SE/TE: 535, 536-540, 528-532

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<p>numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.</p>	<p>AR.9-12.LA.AI.1.6 (LA.1.AI.6) Simplify algebraic fractions by factoring</p>	<p>Algebra 1: SE/TE: 671-675</p> <p>Algebra 2: SE/TE: 288-295 TE: 295A</p>
	<p>AR.9-12.LA.AI.1.7 (LA.1.AI.7) Recognize when an expression is undefined</p>	<p>Algebra 1: SE/TE: 664-665</p> <p>Algebra 2: SE/TE: 516-523, 527-529 TE: 523A</p>
	<p>AR.9-12.RF.AII.1.2 (RF.1.AII.2) Evaluate, add, subtract, multiply, and divide functions and give appropriate domain and range restrictions</p>	<p>Algebra 1: SE/TE: 670-674, 684-689</p> <p>Algebra 2: SE/TE: 398-404 TE: 404A</p>
	<p>AR.9-12.PRF.AIII.2.3 (PRF.2.AIII.3) Simplify, add, subtract, multiply, and divide with rational expressions</p>	<p>Algebra 1: SE/TE: 670-674, 684-689</p> <p>Algebra 2: SE/TE: 398-404 TE: 404A</p>
<p>CC.9-12.A.CED.1 Create equations that describe numbers or relationship. 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.*</p>	<p>AR.9-12.SEI.AI.2.1 (SEI.2.AI.1) Solve multi-step equations and inequalities with rational coefficients: -- numerically (from a table or guess and check), -- algebraically (including the use of manipulatives), -- graphically, -- technologically</p>	<p>Algebra 1: SE/TE: 94-100, 186-192 TE: 100A, 192A</p> <p>Algebra 2: SE/TE: 27-32, 33-40 TE: 32B, 40B</p>
	<p>AR.9-12.LEI.AII.2.1 (LEI.2.AII.1) Solve, with and without appropriate technology, absolute value equations and inequalities written in one or two variables, and graph solutions.</p>	<p>Algebra 1: SE/TE: 207-213</p> <p>Geometry: SE/TE: 892</p> <p>Algebra 2: SE/TE: 41-48, 107-113 TE: 48A, 90A, 113A</p>

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	AR.9-12.QEF.AII.3.6 (QEF.3.AII.6) Apply the concepts of quadratic equations and functions to model real world situations by using appropriate technology when needed	Algebra 1: SE/TE: 563, 570-571, 578, 584 Geometry: SE/TE: TE: 439 Algebra 2: SE/TE: 209-214 TE: 214A
	AR.9-12.ELF.AII.5.4 (ELF.5.AII.4) Recognize and solve problems that can be modeled using exponential functions	Algebra 1: SE/TE: 455, 461-465, 591 Algebra 2: SE/TE: 436-440, 471, 474-476 TE: 441A Lesson Resources
(Continued) CC.9-12.A.CED.1 Create equations that describe numbers or relationship. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and	AR.9-12.LF.AC.2.1 (LF.2.AC.1) Create, given a graph without an explicit formula, a written or oral interpretation of the relationship between the independent and dependent variables	Algebra 1: SE/TE: 240-244, 246-251 TE: 245A, 251A Lesson Resources Algebra 2: SE/TE: 94-98, 211-213, 331-337, TE: 98A Lesson Resources, 338A Lesson Resources

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<p>simple rational and exponential functions.*</p>	<p>AR.9-12.SEI.AC.3.6 (SEI.3.AC.6) SLE 6. Apply linear, piece-wise and step functions to real world situations that involve a combination of rates, proportions and percents such as sales tax, simple interest, social security, constant depreciation and appreciation, arithmetic sequences, constant rate of change, income taxes, postage, utility bills, commission, and traffic tickets</p>	<p>Algebra 1: SE/TE: 8, 169, 249-242, 348, 462</p> <p>Algebra 2: SE/TE: 64, 84, 90-91, 576</p>
	<p>AR.9-12.ELF.PCT.2.3 (ELF.2.PCT.3) Solve graphically, algebraically and numerically, with and without appropriate technology, equations and real world problems involving exponential and logarithmic expressions</p>	<p>Algebra 1: SE/TE: 460-464</p> <p>Algebra 2: SE/TE: 437, 469-476, 477, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources</p>
	<p>AR.9-12.SEI.AI.2.4 (SEI.2.AI.4) Solve and graph simple absolute value equations and inequalities</p>	<p>Algebra 1: SE/TE: 207-212</p> <p>Geometry: TE: 892</p> <p>Algebra 2: SE/TE: 41-48 TE: 48A Lesson Resources</p>
<p>(Continued) CC.9-12.A.CED.1 Create equations that describe numbers or relationship. 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.*</p>	<p>AR.9-12.PRF.AIII.2.4 (PRF.2.AIII.4) Describe, with and without appropriate technology, the fundamental characteristics of rational functions: zeros, discontinuities (including vertical asymptotes), and end behavior (including horizontal asymptotes)</p>	<p>Algebra 1: SE/TE: 705-712 TE: 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 282-283, 435, 515-523, 524-525 TE: 523A Lesson Resources</p>

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<p>CC.9-12.A.CED.2 Create equations that describe numbers or relationship. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*</p>	<p>AR.9-12.CGT.G.5.2 (CGT.5.G.2) Write the equation of a line parallel to a line through a given point not on the line</p>	<p>Algebra 1: SE/TE: 330,332</p> <p>Geometry: SE/TE: 197-204</p> <p>Algebra 2: SE/TE: 85</p>
	<p>AR.9-12.CGT.G.5.3 (CGT.5.G.3) Write the equation of a line perpendicular to a line through a given point</p>	<p>Algebra 1: SE/TE: 331,332</p> <p>Geometry: SE/TE: 198, 199, 202 TE: 204A Lesson Resources</p> <p>Algebra 2: SE/TE: 85</p>
	<p>AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically</p>	<p>Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 194-201, 203-204, 209-211, 232, 242-243, 268</p>
	<p>AR.9-12.QEF.AII.3.6 (QEF.3.AII.6) Apply the concepts of quadratic equations and functions to model real world situations by using appropriate technology when needed</p>	<p>Algebra 1: SE/TE: 563, 570-571, 578,584</p> <p>Geometry: TE: 439</p> <p>Algebra 2: SE/TE: 209-214 TE: 214A Lesson Resources</p>

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<p>(Continued) CC.9-12.A.CED.2 Create equations that describe numbers or relationship. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.*</p>	<p>AR.9-12.PRF.AII.4.2 (PRF.4.AII.2) Analyze and sketch, with and without appropriate technology, the graph of a given polynomial function, determining the characteristics of domain and range, maximum and minimum points, end behavior, zeros, multiplicity of zeros, y-intercept, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 76, 107, 194-196, 268, 291, 292, 622</p>
	<p>AR.9-12.PRF.AII.4.3 (PRF.4.AII.3) Write the equation of a polynomial function given its roots</p>	<p>Algebra 1: SE/TE: 573</p> <p>Algebra 2: SE/TE: 232</p>
	<p>AR.9-12.PRF.AII.4.4 (PRF.4.AII.4) Identify the equation of a polynomial function given its graph or table</p>	<p>Algebra 1: SE/TE: 240-245, 247-251 TE: 245A, 251A Lesson Resources</p> <p>Algebra 2: SE/TE: 283-284</p>
	<p>AR.9-12.ELF.AII.5.2 (ELF.5.AII.2) Graph exponential functions and identify key characteristics: domain, range, intercepts, asymptotes, and end behavior</p>	<p>Algebra 1: SE/TE: 455, 460-463</p> <p>Algebra 2: SE/TE: 434-441, 442-450 TE: 441A, 450A Lesson Resources</p>
	<p>AR.9-12.ELF.AII.5.4 (ELF.5.AII.4) Recognize and solve problems that can be modeled using exponential functions</p>	<p>Algebra 1: SE/TE: 455, 461-465, 591</p> <p>Algebra 2: SE/TE: 434, -440, 448-449, 471</p>
	<p>AR.9-12.LQF.AIII.1.2 (LQF.1.AIII.2) Develop, write, and graph, with and without appropriate technology, equations of lines in slope-intercept, point-slope, and standard forms given: -- a point and the slope, -- two points, -- real world data</p>	<p>Algebra 1: SE/TE: 308-313, 315-320, 322-329 TE: 314A Lesson Resources, 320A Lesson Resources, 328A Lesson Resources</p> <p>Geometry: SE/TE: 189-195 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 74-80, 81-88 TE: 80A, 88A Lesson Resources</p>

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	<p>AR.9-12.LQF.AIII.1.3 (LQF.1.AIII.3) Develop, write, and graph, given a point and the slope, two points, or a point and a line, the equation of: -- a parallel line -- a perpendicular line -- the perpendicular bisector of a line segment</p>	<p>Algebra 1: SE/TE: 330-335 TE: 335A Lesson Resources</p> <p>Geometry: SE/TE: 197-204 TE: 204A Lesson Resources</p> <p>Algebra 2: SE/TE: 85</p>
	<p>AR.9-12.LF.AC.2.7 (LF.2.AC.7) Write an equation given: -- two points, -- a point and y-intercept, -- an x-intercept and y-intercept, -- a point and slope, -- a table of data, -- the graph of a line</p>	<p>Algebra 1: SE/TE: 336-343, 308-313, 315-320, 322-329 TE:343A, 314A, 320A, 328A Lesson Resources</p> <p>Geometry: SE/TE: 189-195 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 77-80, 81-88 TE: 88A, 80A Lesson Resources</p>
	<p>AR.9-12.C.PCT.3.1 (C.3.PCT.1) Identify, graph, write, and analyze equations of conic sections, using properties such as symmetry, intercepts, foci, asymptotes, and eccentricity, and when appropriate, use technology</p>	<p>Algebra 2: SE/TE: 614-620, 622-629, 630-636, 638-644, 645-652, 653-660 TE: 620A, 621, 629A, 636A, 644A, 652A, 660A</p>
<p>CC.9-12.A.CED.3 Create equations that describe numbers or relationship. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*</p>	<p>AR.9-12.LQF.AIII.1.7 (LQF.1.AIII.7) Solve, with and without appropriate technology, systems of linear and quadratic equations and inequalities with two or more variables</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384, 400-405, 596-601 TE:369A, 377A, 384A, 405A, 601A Lesson Resources</p> <p>Algebra 2: SE/TE: 258-264, TE: 264A Lesson Resources</p>

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<p>(Continued) CC.9-12.A.CED.3 Create equations that describe numbers or relationship. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*</p>	<p>AR.9-12.LEI.AII.2.2 (LEI.2.AII.2) Solve, with and without appropriate technology, systems of linear equations with two variables and graph the solution set</p>	<p>Algebra 1: SE/TE: 364-369 TE: 369A Lesson Resources</p> <p>Geometry: SE/TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>
	<p>AR.9-12.LEI.AII.2.4 (LEI.2.AII.4) Solve, with and without appropriate technology, systems of linear equations with *three variables using algebraic methods, including matrices</p>	<p>Algebra 2: SE/TE: 166-173 TE: 173A Lesson Resources</p>
	<p>AR.9-12.LEI.AII.2.5 (LEI.2.AII.5) Apply, with or without technology, the concepts of linear and absolute value equations and inequalities and systems of linear equations and inequalities to model real world situations including linear programming</p>	<p>Algebra 1: SE/TE: 387-392 TE: 392A Lesson Resources</p> <p>Algebra 2: SE/TE: 157-162 TE: 162A Lesson Resources</p>
	<p>AR.9-12.RF.AII.1.5 (RF.1.AII.5) Graph, with and without appropriate technology, functions defined as piece-wise and step</p>	<p>Algebra 1: SE/TE: 348</p> <p>Algebra 2: SE/TE: 90-91</p>
	<p>AR.9-12.OP.TDM.2.1 (OP.2.TDM.1) Graph systems of linear inequalities with multiple constraints and identify vertices of the feasible region</p>	<p>Algebra 1: SE/TE: 400-405 TE: 405A Lesson Resources</p> <p>Algebra 2: SE/TE: 157-162 TE: 162A Lesson Resources</p>
	<p>AR.9-12.C.PCT.3.2 (C.3.PCT.2) Solve, with and without appropriate technology, systems of equations and inequalities involving conics and other types of equations</p>	<p>Algebra 2: TE: 661</p>

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	AR.9-12.LQF.AIII.1.1 (LQF.1.AIII.1) Evaluate, add, subtract, multiply, divide and compose functions and determine appropriate domain and range restrictions	Algebra 1: SE/TE: 374, 388,4 02 TE: 405A Lesson Resources Algebra 2: SE/TE: 398-404 TE: 404A Lesson Resources
	AR.9-12.LQF.AIII.1.8 (LQF.1.AIII.8) Apply, with and without appropriate technology the concepts of functions to real world situations including linear programming	Algebra 1: SE/TE: 402-403 Algebra 2: SE/TE: 159-161
CC.9-12.A.CED.4 Create equations that describe numbers or relationship. 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.* (Continued) CC.9-12.A.CED.4 Create equations that describe numbers or relationship. 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.*	AR.9-12.SEI.AI.2.3 (SEI.2.AI.3) Solve linear formulas and literal equations for a specified variable	Algebra 1: SE/TE: 109-114 TE: 114A Lesson Resources Geometry: SE/TE: 698 Algebra 2: SE/TE: 28-31
	AR.9-12.SEI.AC.3.3 (SEI.3.AC.3) SLE 3. Solve linear formulas and literal equations for a specified variable	Algebra 1: SE/TE: 109-114 TE: 114A Lesson Resources Geometry: SE/TE: 698 Algebra 2: SE/TE: 28-31
CC.9-12.A.REI.1 Understand solving equations as a process of reasoning and explain the reasoning. 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	AR.9-12.SEI.AI.2.1 (SEI.2.AI.1) Solve multi-step equations and inequalities with rational coefficients: -- numerically (from a table or guess and check), -- algebraically (including the use of manipulatives), -- graphically, -- technologically	Algebra 1: SE/TE: 94-100, 186-192 TE: 100A, 192A Algebra 2: SE/TE: 27-32, 33-40 TE: 32B, 40B Lesson Resources

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argument to justify a solution method.	AR.9-12.SEI.AC.3.1 (SEI.3.AC.1) SLE 1. Solve, with and without appropriate technology, multi-step equations and inequalities with rational coefficients numerically, algebraically and graphically	Algebra 1: SE/TE: 94-100, 186-192 TE: 100A, 192A Lesson Resources Algebra 2: SE/TE: 26-31 TE: 32A Lesson Resources
	AR.9-12.PRF.PCT.1.2 (PRF.1.PCT.2) Solve, with and without appropriate technology, polynomial equations utilizing techniques such as Descartes' Rule of Signs, upper and lower bounds, Intermediate Value Theorem and Rational Root Theorem	Algebra 2: SE/TE: 315-317 TE: 317A Lesson Resources
CC.9-12.A.REI.2 Understand solving equations as a process of reasoning and explain the reasoning. Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	No Matches in Arkansas Frameworks	Algebra 1: SE/TE: 633-638, 691-697 TE: 638A, 697A Lesson Resources Algebra 2: SE/TE: 390-397, 542-548 TE: 397A, 548A
CC.9-12.A.REI.3 Solve equations and inequalities in one variable. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	AR.9-12.SEI.AI.2.1 (SEI.2.AI.1) Solve multi-step equations and inequalities with rational coefficients: -- numerically (from a table or guess and check), -- algebraically (including the use of manipulatives), -- graphically, -- technologically	Algebra 1: SE/TE: 94-100, 186-192 TE: 100A, 192A Lesson Resources Algebra 2: SE/TE: 27-32, 33-40 TE: 32B, 40B Lesson Resources
	AR.9-12.SEI.AC.3.1 (SEI.3.AC.1) SLE 1. Solve, with and without appropriate technology, multi-step equations and inequalities with rational coefficients numerically, algebraically and graphically	Algebra 1: SE/TE: 94-100, 186-192 TE: 100A, 192A Lesson Resources Algebra 2: SE/TE: 27-32, 33-40 TE: 32B, 40B Lesson Resources

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	AR.9-12.SEI.AI.2.3 (SEI.2.AI.3) Solve linear formulas and literal equations for a specified variable	Algebra 1: SE/TE: 109-114 TE: 114A Lesson Resources Geometry: SE/TE: 698 Algebra 2: SE/TE: 28-31
	AR.9-12.SEI.AC.3.3 (SEI.3.AC.3) SLE 3. Solve linear formulas and literal equations for a specified variable	Algebra 1: SE/TE: 109-114 TE: 114A Lesson Resources Geometry: SE/TE: 698 Algebra 2: SE/TE: 28-31
CC.9-12.A.REI.4 Solve equations and inequalities in one variable. Solve quadratic equations in one variable.	AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula	Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources Geometry: TE: 439 Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources
	AR.9-12.QEF.AII.3.4 (QEF.3.AII.4) Derive the quadratic formula and use it to solve equations	Algebra 1: SE/TE: 583-588 TE: 588A Lesson Resources Geometry: SE/TE: 439 Algebra 2: SE/TE: 240-247

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<p>(Continued) CC.9-12.A.REI.4 Solve equations and inequalities in one variable. Solve quadratic equations in one variable.</p>	<p>AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically</p>	<p>Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 194-201, 242-243, 232 TE: 201A Lesson Resources</p>
	<p>AR.9-12.LQF.AIII.1.5 (LQF.1.AIII.5) Solve, with and without appropriate technology, quadratic equations by: -- extracting the square root, -- graphing, -- factoring, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Algebra 2: SE/TE: 219-223, 226-231, 233-239 TE: 239A, 231A Lesson Resources</p>
	<p>AR.9-12.NF.AC.4.3 (NF.4.AC.3) Solve, with and without appropriate technology, quadratic equations with real number solutions using factoring and the quadratic formula</p>	<p>Algebra 1: SE/TE: 568-572, 582-588</p> <p>Algebra 2: SE/TE: 226-229, 240-247 TE: 247A Lesson Resources</p>

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	<p>AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology: -- factoring, -- quadratic formula with real number solutions</p>	<p>Algebra 1: SE/TE: 582-588, 568-569 TE: 588A Lesson Resources</p> <p>Algebra 2: SE/TE: 226-229, 240-247 TE: 247A Lesson Resources</p>
<p>CC.9-12.A.REI.4a 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.</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 1: SE/TE: 582-588 TE: 588A Lesson Resources</p> <p>Geometry: TE:439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources</p>
	<p>AR.9-12.QEF.AII.3.4 (QEF.3.AII.4) Derive the quadratic formula and use it to solve equations</p>	<p>Algebra 1: SE/TE: 583-588 TE: 588A Lesson Resources</p> <p>Algebra 2: SE/TE: 240-247</p>

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	<p>AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations:</p> <ul style="list-style-type: none"> -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically 	<p>Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 194-201, 242-243, 232 TE: 201A Lesson Resources</p>
<p>CC.9-12.A.REI.4b 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</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by:</p> <ul style="list-style-type: none"> -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula 	<p>Algebra 1: SE/TE: 582-588 TE: 588A Lesson Resources</p> <p>Geometry: TE: 439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources</p>

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numbers a and b.	AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically	Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources Algebra 2: SE/TE: 194-201, 242-243, 232 TE: 201A Lesson Resources
	AR.9-12.LQF.AIII.1.5 (LQF.1.AIII.5) Solve, with and without appropriate technology, quadratic equations by: -- extracting the square root, -- graphing, -- factoring, -- completing the square, -- using the quadratic formula	Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources Algebra 2: SE/TE: 219-223, 226-231, 233-239, 252-253 TE: 239A, 231A Lesson Resources
(Continued) CC.9-12.A.REI.4b 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.	AR.9-12.NF.AC.4.3 (NF.4.AC.3) Solve, with and without appropriate technology, quadratic equations with real number solutions using factoring and the quadratic formula	Algebra 1: SE/TE: 568-572, 582-588 Algebra 2: SE/TE: 226-229, 240-247, 252-253 TE: 247A Lesson Resources

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<p>CC.9-12.A.REI.5 Solve systems of equations. 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.</p>	<p>AR.9-12.LEI.AII.2.2 (LEI.2.AII.2) Solve, with and without appropriate technology, systems of linear equations with two variables and graph the solution set</p>	<p>Algebra 1: SE/TE: 364-369 TE: 369A Lesson Resources</p> <p>Geometry: TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>
	<p>AR.9-12.SEI.AI.2.2 (SEI.2.AI.2) Solve systems of two linear equations: -- numerically (from a table or guess and check), -- algebraically (including the use of manipulatives), -- graphically, -- technologically</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384 TE: 369A, 377A, 384A Lesson Resources</p> <p>Geometry: TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>
	<p>AR.9-12.LQF.AIII.1.7 (LQF.1.AIII.7) Solve, with and without appropriate technology, systems of linear and quadratic equations and inequalities with two or more variables</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384, 400-405, 596-601 TE: 369A, 377A, 384A, 405A, 601A Lesson Resources</p> <p>Algebra 2: SE/TE: 258-264, TE: 264A Lesson Resources</p>
<p>(Continued) CC.9-12.A.REI.5 Solve systems of equations. 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.</p>	<p>AR.9-12.SEI.AC.3.2 (SEI.3.AC.2) SLE 2. Solve, with and without appropriate technology, systems of two linear equations and systems of two inequalities numerically, algebraically and graphically</p>	<p>Algebra 1: SE/TE: 364-368, 372-376, 378-383, 400-404 TE: 363A, 369A, 377A Lesson Resources</p> <p>Algebra 2: SE/TE: 134-141, 142-148, 157-162 TE: 162A, 141A, 148A Lesson Resources</p>

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<p>CC.9-12.A.REI.6 Solve systems of equations. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</p>	<p>AR.9-12.LEI.AII.2.2 (LEI.2.AII.2) Solve, with and without appropriate technology, systems of linear equations with two variables and graph the solution set</p>	<p>Algebra 1: SE/TE: 364-369 TE: 369A Lesson Resources</p> <p>Geometry: SE/TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>
	<p>AR.9-12.LQF.AIII.1.7 (LQF.1.AIII.7) Solve, with and without appropriate technology, systems of linear and quadratic equations and inequalities with two or more variables</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384, 400-405, 596-601 TE: 369A, 377A, 384A, 405A, 601A Lesson Resources</p> <p>Algebra 2: SE/TE: 258-264 TE: 264A Lesson Resources</p>
	<p>AR.9-12.SEI.AC.3.2 (SEI.3.AC.2) SLE 2. Solve, with and without appropriate technology, systems of two linear equations and systems of two inequalities numerically, algebraically and graphically</p>	<p>Algebra 1: SE/TE: 364-368, 372-376, 378-383, 400-404 TE: 363A, 369A, 377A Lesson Resources</p> <p>Algebra 2: SE/TE: 134-141, 142-148, 157-162 TE: 162A, 163, 141A, 148A Lesson Resources</p>
<p>(Continued) CC.9-12.A.REI.6 Solve systems of equations. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.</p>	<p>AR.9-12.SEI.AI.2.2 (SEI.2.AI.2) Solve systems of two linear equations: -- numerically (from a table or guess and check), -- algebraically (including the use of manipulatives), -- graphically, -- technologically</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384 TE: 369A, 377A, 384A Lesson Resources</p> <p>Geometry: TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>

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<p>CC.9-12.A.REI.7 Solve systems of equations. 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 $x^2 + y^2 = 3$.</p>	<p>AR.9-12.LQF.AIII.1.7 (LQF.1.AIII.7) Solve, with and without appropriate technology, systems of linear and quadratic equations and inequalities with two or more variables</p> <p>AR.9-12.C.PCT.3.2 (C.3.PCT.2) Solve, with and without appropriate technology, systems of equations and inequalities involving conics and other types of equations</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384, 400-405, 596-601 TE: 369A, 377A, 384A, 405A, 601A Lesson Resources</p> <p>Algebra 2: SE/TE: 258-264, TE: 264A Lesson Resources</p> <p>Studied in 4th year course.</p>
<p>CC.9-12.A.REI.8 (+) Solve systems of equations. Represent a system of linear equations as a single matrix equation in a vector variable.</p>	<p>AR.9-12.LEI.AII.2.4 (LEI.2.AII.4) Solve, with and without appropriate technology, systems of linear equations with *three variables using algebraic methods, including matrices</p>	<p>Studied in 4th year course.</p>

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	AR.9-12.LEI.AII.2.5 (LEI.2.AII.5) Apply, with or without technology, the concepts of linear and absolute value equations and inequalities and systems of linear equations and inequalities to model real world situations including linear programming	Algebra 1: SE/TE: 387-392 TE: 392A Lesson Resources Algebra 2: SE/TE: 157-162 TE: 162A Lesson Resources, 163
	AR.9-12.MA.TDM.1.2 (MA.1.TDM.2) Solve real-world problems involving systems of linear equations using matrices (e.g., inverses, augmented, Cramer's rule)	Algebra 2: SE/TE: 175-181, 795-796 TE: 181A Lesson Resources
	AR.9-12.LSM.TFM.1.1 (LSM.1.TFM.1) Use matrices (e.g., row-echelon form, Gauss-Jordan method, inverses) to solve systems of linear equations, with or without technology	Algebra 1: SE/TE: 385 Algebra 2: SE/TE: 186, 784-790 TE: 790A Lesson Resources
CC.9-12.A.REI.9 (+) Solve systems of equations. Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3×3 or greater).	AR.9-12.LEI.AII.2.3 (LEI.2.AII.3) Develop and apply, with and without appropriate technology, the basic operations and properties of matrices (associative, commutative, identity, and inverse)	Algebra 2: SE/TE: 764-770 TE: 770A Lesson Resources

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	AR.9-12.LEI.AII.2.4 (LEI.2.AII.4) Solve, with and without appropriate technology, systems of linear equations with *three variables using algebraic methods, including matrices	Algebra 2: SE/TE: 166-173, 796 TE: 173A, 800A, 800B Lesson Resources
	AR.9-12.MA.TDM.1.2 (MA.1.TDM.2) Solve real-world problems involving systems of linear equations using matrices (e.g., inverses, augmented, Cramer's rule)	Algebra 2: SE/TE: 175-181, 795-796 TE: 181A Lesson Resources
	AR.9-12.MA.TDM.1.3 (MA.1.TDM.3) Find and use the inverse of a matrix to solve real-world problems (e.g., cryptology)	Algebra 2: SE/TE: 787, 796
	AR.9-12.LSM.TFM.1.2 (LSM.1.TFM.2) Find and use the inverse of a matrix to solve real-world problems (e.g., cryptology)	Algebra 2: SE/TE: 787, 796
CC.9-12.A.REI.10 Represent and solve equations and inequalities graphically. 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).	AR.9-12.LEI.AII.2.1 (LEI.2.AII.1) Solve, with and without appropriate technology, absolute value equations and inequalities written in one or two variables, and graph solutions.	Algebra 1: SE/TE: 207-213 Geometry: TE: 892 Algebra 2: SE/TE: 41-48, 107-113 TE: 48A, 90A, 113A Lesson Resources

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	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Geometry: TE:439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources</p>
	<p>AR.9-12.PRF.AII.4.2 (PRF.4.AII.2) Analyze and sketch, with and without appropriate technology, the graph of a given polynomial function, determining the characteristics of domain and range, maximum and minimum points, end behavior, zeros, multiplicity of zeros, y-intercept, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 76,107, 194-196, 268,291, 292, 622</p>
	<p>AR.9-12.ELF.AII.5.2 (ELF.5.AII.2) Graph exponential functions and identify key characteristics: domain, range, intercepts, asymptotes, and end behavior</p>	<p>Algebra 1: SE/TE: 455, 460-463</p> <p>Algebra 2: SE/TE: 434-441, 442-450 TE: 441A, 450A Lesson Resources</p>
<p>(Continued) CC.9-12.A.REI.10 Represent and solve equations and inequalities graphically. 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).</p>	<p>AR.9-12.SEI.AC.3.1 (SEI.3.AC.1) SLE 1. Solve, with and without appropriate technology, multi-step equations and inequalities with rational coefficients numerically, algebraically and graphically</p>	<p>Algebra 1: SE/TE: 364-369, 387-392</p> <p>Algebra 2: SE/TE: 26-31 TE: 32A Lesson Resources</p>

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<p>CC.9-12.A.REI.11 Represent and solve equations and inequalities graphically. 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.*</p>	<p>AR.9-12.SEI.AI.2.2 (SEI.2.AI.2) Solve systems of two linear equations: -- numerically (from a table or guess and check), -- algebraically (including the use of manipulatives), -- graphically, -- technologically</p>	<p>Algebra 1: SE/TE: 364-369, 372-377, 378-384 TE: 369A, 377A, 384A Lesson Resources, 371, 370</p> <p>Geometry: SE/TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>
	<p>AR.9-12.ELF.AIII.3.3 (ELF.3.AIII.3) Solve, with and without appropriate technology, equations and real world problems involving exponential and logarithmic expressions graphically, algebraically and numerically</p>	<p>Algebra 2: SE/TE: 437-440, 448-449, 480-482 TE: 477</p>
	<p>AR.9-12.LEI.AII.2.1 (LEI.2.AII.1) Solve, with and without appropriate technology, absolute value equations and inequalities written in one or two variables, and graph solutions.</p>	<p>Algebra 1: SE/TE: 207-213</p> <p>Geometry: SE/TE: 892</p> <p>Algebra 2: SE/TE: 41-48, 107-113 TE: 48A, 90A, 113A Lesson Resources</p>
<p>(Continued) CC.9-12.A.REI.11 Represent and solve equations and inequalities graphically. 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</p>	<p>AR.9-12.LEI.AII.2.2 (LEI.2.AII.2) Solve, with and without appropriate technology, systems of linear equations with two variables and graph the solution set</p>	<p>Algebra 1: SE/TE: 364-369 TE: 369A Lesson Resources</p> <p>Geometry: SE/TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>

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<p>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.*</p>	<p>AR.9-12.SEI.AC.3.2 (SEI.3.AC.2) SLE 2. Solve, with and without appropriate technology, systems of two linear equations and systems of two inequalities numerically, algebraically and graphically</p>	<p>Algebra 1: SE/TE: 364-368, 372-376, 378-383, 400-404 TE: 363A, 369A, 377A Lesson Resources</p> <p>Algebra 2: SE/TE: 134-141, 142-148, 157-162 TE: 162A, 163, 141A, 148A Lesson Resources</p>
	<p>AR.9-12.ELF.PCT.2.3 (ELF.2.PCT.3) Solve graphically, algebraically and numerically, with and without appropriate technology, equations and real world problems involving exponential and logarithmic expressions</p>	<p>Algebra 1: SE/TE: 460-464</p> <p>Algebra 2: SE/TE: 437-440, 448-449, 480-482 TE: 477</p>
<p>CC.9-12.A.REI.12 Represent and solve equations and inequalities graphically. 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</p>	<p>AR.9-12.LEI.AII.2.1 (LEI.2.AII.1) Solve, with and without appropriate technology, absolute value equations and inequalities written in one or two variables, and graph solutions.</p>	<p>Algebra 1: SE/TE: 207-213</p> <p>Geometry: TE: 892</p> <p>Algebra 2: SE/TE: 41-48, 107-113 TE: 48A, 90A, 113A Lesson Resources</p>

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the corresponding half-planes.	AR.9-12.LEI.AII.2.2 (LEI.2.AII.2) Solve, with and without appropriate technology, systems of linear equations with two variables and graph the solution set	Algebra 1: SE/TE: 364-369 TE: 369A Lesson Resources Geometry: SE/TE: 257 Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources
	AR.9-12.LEI.AII.2.5 (LEI.2.AII.5) Apply, with or without technology, the concepts of linear and absolute value equations and inequalities and systems of linear equations and inequalities to model real world situations including linear programming	Algebra 1: SE/TE: 387-392 TE: 392A Lesson Resources Algebra 2: SE/TE: 157-162 TE: 162A Lesson Resources
	AR.9-12.SEI.AC.3.2 (SEI.3.AC.2) SLE 2. Solve, with and without appropriate technology, systems of two linear equations and systems of two inequalities numerically, algebraically and graphically	Algebra 1: SE/TE: 364-368, 372-376, 378-383, 400-404 TE: 363A, 369A, 377A Lesson Resources Algebra 2: SE/TE: 134-141, 142-148, 157-162 TE: 162A, 163, 141A, 148A Lesson Resources
(Continued) CC.9-12.A.REI.12 Represent and solve equations and inequalities graphically. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict	AR.9-12.OP.TDM.2.1 (OP.2.TDM.1) Graph systems of linear inequalities with multiple constraints and identify vertices of the feasible region	Algebra 1: SE/TE: 400-405 TE: 405A Lesson Resources Algebra 2: SE/TE: 157-162 TE: 162A Lesson Resources

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inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	AR.9-12.LSM.TFM.1.3 (LSM.1.TFM.3) Graph systems of linear inequalities with multiple constraints and identify vertices of the feasible region	Algebra 2: SE/TE: 157-162 TE: 162A Lesson Resources
	AR.9-12.LQF.AIII.1.8 (LQF.1.AIII.8) Apply, with and without appropriate technology the concepts of functions to real world situations including linear programming	Algebra 1: SE/TE: 402-403 Algebra 2: SE/TE: 159-161
Functions		
CC.9-12.F.IF.1 Understand the concept of a function and use function notation. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain	AR.9-12.LF.AI.3.1 (LF.3.AI.1) Distinguish between functions and non-functions/relations by inspecting graphs, ordered pairs, mapping diagrams and/or tables of data	Algebra 1: SE/TE: 246-251, 253-259 TE: 251A, 259A Lesson Resources Algebra 2: SE/TE: 60-67 TE: 67A Lesson Resources

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<p>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 $y = f(x)$.</p>	<p>AR.9-12.LF.AI.3.2 (LF.3.AI.2) Determine domain and range of a relation from an algebraic expression, graphs, set of ordered pairs, or table of data</p>	<p>Algebra 1: SE/TE: 268-273 TE: 273A Lesson Resources</p> <p>Algebra 2: SE/TE: 60-67</p>
	<p>AR.9-12.LF.AI.3.3 (LF.3.AI.3) Know and/or use function notation, including evaluating functions for given values in their domain</p>	<p>Algebra 1: SE/TE: 263, 269</p> <p>Algebra 2: SE/TE: 63-65</p>
	<p>AR.9-12.RF.AII.1.1 (RF.1.AII.1) Determine, with or without technology, the domain and range of a relation defined by a graph, a table of values, or a symbolic equation including those with restricted domains and whether a relation is a function</p>	<p>Algebra 1: SE/TE: 268-271</p> <p>Algebra 2: SE/TE: 60-67 TE: 67A Lesson Resources</p>
<p>CC.9-12.F.IF.2 Understand the concept of a function and use function notation. Use function notation, evaluate functions for inputs in their domains, and interpret statements that</p>	<p>AR.9-12.LF.AI.3.3 (LF.3.AI.3) Know and/or use function notation, including evaluating functions for given values in their domain</p>	<p>Algebra 1: SE/TE: 269-270</p> <p>Algebra 2: SE/TE: 63-65</p>

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use function notation in terms of a context.	AR.9-12.NF.AC.4.5 (NF.4.AC.5) Identify and apply nonlinear functions to real world situations such as acceleration, area, volume, population, bacteria, compound interest, percent depreciation and appreciation, amortization, geometric sequences, etc.	Algebra 1: SE/TE: 236, 238, 244, 245, 250, 251, 258, 262, 264, 265, 266, 271, 272 Algebra 2: SE/TE: 471, 474-476, 480, 482-483
CC.9-12.F.IF.3 Understand the concept of a function and use function notation. 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 $n \geq 1$ (n is greater than or equal to 1).	AR.9-12.DIP.AI.5.9 (DIP.5.AI.9) Recognize patterns using explicitly defined and recursively defined linear functions	Algebra 1: SE/TE: 275-281 TE: 281A Lesson Resources Algebra 2: SE/TE: 565-569
	AR.9-12.PD.CM.2.6 (PD.2.CM.6) Develop recursive relationships from mathematical models (e.g. arithmetic and geometric sequences).	Algebra 1: SE/TE: 275-278, 467-469 Algebra 2: SE/TE: 572-577, 580-586 TE: 577A, 586A Lesson Resources
	AR.9-12.SS.PCT.4.1 (SS.4.PCT.1) Develop, with and without appropriate technology, a representation of sequences recursively	Algebra 1: SE/TE: 275-281, 467-471 TE: 472A, 281A Lesson Resources Algebra 2: TE: 578
	AR.9-12.SS.PCT.4.5 (SS.4.PCT.5) Use, with and without appropriate technology, sequences and series to solve real world problems	Algebra 1: SE/TE: 277, 279, 469, 471 Algebra 2: SE/TE: 574, 576, 582, 584, 585, 592, 600 TE: 586A Lesson Resources
(Continued) CC.9-12.F.IF.3 Understand the concept of a function and use function notation. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the	AR.9-12.SS.AIII.4.3 (SS.4.AIII.3) Solve, with and without appropriate technology, problems involving the sum (including Sigma notation) of finite and infinite sequences and series	Algebra 2: SE/TE: 572-577, 580-586

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<p>Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$ (n is greater than or equal to 1).</p>	<p>AR.9-12.PI.CM.3.2 (PI.3.CM.2) Create functions using recursions and loops.</p>	<p>Algebra 1: SE/TE: 275, 469</p> <p>Algebra 2: SE/TE: 572, 580</p>
	<p>AR.9-12.SS.PCT.4.4 (SS.4.PCT.4) Determine the nth term of a sequence given a rule or specific terms and use appropriate technology when needed</p>	<p>Algebra 1: SE/TE: 274-276, 467-469</p> <p>Algebra 2: SE/TE: 573, 575, 581</p>
	<p>AR.9-12.SS.AIII.4.4 (SS.4.AIII.4) Determine, with and without appropriate technology, the nth term of a sequence given a rule or specific terms</p>	<p>Algebra 1: SE/TE: 274-276, 467-469</p> <p>Algebra 2: SE/TE: 573, 575, 581, 584</p>
<p>CC.9-12.F.IF.4 Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables</p>	<p>AR.9-12.RF.AII.1.6 (RF.1.AII.6) Recognize periodic phenomena (sine or cosine functions such as sound waves, length of daylight, circular motion)</p>	<p>Algebra 2: SE/TE: 855, 857, 858, 863, 864, 866</p>

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<p>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.*</p>	<p>AR.9-12.RF.AII.1.7 (RF.1.AII.7) Investigate and identify key characteristics of period functions and their graphs (period, amplitude, maximum, and minimum)</p>	<p>Algebra 2: SE/TE: 853-854, 856, 862, 865</p>
	<p>AR.9-12.RF.AII.1.8 (RF.1.AII.8) Use basic properties of frequency and amplitude to solve problems</p>	<p>Algebra 2: SE/TE: 851-858, 861-867</p>
	<p>AR.9-12.PRF.AIII.2.2 (PRF.2.AIII.2) Investigate and sketch the graphs of polynomial and rational functions using the characteristics of domain and range, upper and lower bounds, maximum and minimum points, asymptotes and end behavior, zeros, multiplicity of zeros, y-intercepts, and symmetry with and without appropriate technology</p>	<p>Algebra 1: SE/TE: 546-551, 553-558, 705-712 TE: 558A Lesson Resources, 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 280-287, 515-523 TE: 287A, 523A Lesson Resources</p>
	<p>AR.9-12.RF.AII.1.9 (RF.1.AII.9) Apply the concepts of functions to real world situations</p>	<p>Algebra 1: SE/TE: 348</p> <p>Algebra 2: SE/TE: 436-440, 471, 474-476, 855, 857, 858, 863, 864, 866 TE: 441A Lesson Resources</p>
<p>(Continued) CC.9-12.F.IF.4 Interpret functions that arise in applications in terms of the context. For a function that models a relationship between two quantities, interpret key features of graphs and tables</p>	<p>AR.9-12.LF.AI.3.5 (LF.3.AI.5) Interpret the rate of change/slope and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300 TE: 300A Lesson Resources</p> <p>Algebra 2: SE/TE: 74-80, 81-88 TE: 80A, 88A Lesson Resources</p>

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<p>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.*</p> <p>(Continued) CC.9-12.F.IF.4 Interpret functions that arise in applications in terms of the</p>	<p>AR.9-12.LF.AI.3.8 (LF.3.AI.8) *Write an equation in slope-intercept, point-slope, and standard forms given: -- two points, -- a point and y-intercept, -- x-intercept and y-intercept, -- a point and slope, -- a table of data, -- the graph of a line</p>	<p>Algebra 1: SE/TE: 308-313, 315-320, 322-329 TE: 314A, 320A, 328A Lesson Resources</p> <p>Algebra 2: SE/TE: 74-80, 81-88 TE: 80A, 88A Lesson Resources</p>
	<p>AR.9-12.NLF.AI.4.2 (NLF.4.AI.2) Determine minimum, maximum, vertex, and zeros, given the graph</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 194-196, 290-292</p>
	<p>AR.9-12.PRF.AII.4.2 (PRF.4.AII.2) Analyze and sketch, with and without appropriate technology, the graph of a given polynomial function, determining the characteristics of domain and range, maximum and minimum points, end behavior, zeros, multiplicity of zeros, y-intercept, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 280-287, 288-295 TE: 287A, 295A Lesson Resources</p>
	<p>AR.9-12.PRF.AII.4.5 (PRF.4.AII.5) Identify the characteristics of graphs of power functions of the form $f(x) = ax^n$, for negative integral values of n, including domain, range, end behavior, and behavior at $x = 0$, and compare these characteristics to the graphs of related positive integral power functions</p>	<p>Algebra 2: SE/TE: 339-345 TE: 345A Lesson Resources</p>
	<p>AR.9-12.ELF.AII.5.1 (ELF.5.AII.1) Recognize the graphs of exponential functions distinguishing between growth and decay</p>	<p>Algebra 1: SE/TE: 460-464</p> <p>Algebra 2: SE/TE: 434-441 TE: 441A Lesson Resources</p>

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<p>context. 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.* end behavior; and periodicity.*</p>	<p>AR.9-12.ELF.AII.5.2 (ELF.5.AII.2) Graph exponential functions and identify key characteristics: domain, range, intercepts, asymptotes, and end behavior</p>	<p>Algebra 1: SE/TE: 453-458, 460-464</p> <p>Algebra 2: SE/TE: 442-450 TE: 450A Lesson Resources</p>
	<p>AR.9-12.LF.AC.2.1 (LF.2.AC.1) Create, given a graph without an explicit formula, a written or oral interpretation of the relationship between the independent and dependent variables</p>	<p>Algebra 1: SE/TE: 240-244</p> <p>Algebra 2: SE/TE: 60-67</p>
	<p>AR.9-12.OP.TDM.2.4 (OP.2.TDM.4) Model and solve real-world problems involving optimization of area and volume</p>	<p>Algebra 2: SE/TE: 294</p>
	<p>AR.9-12.C.PCT.3.1 (C.3.PCT.1) Identify, graph, write, and analyze equations of conic sections, using properties such as symmetry, intercepts, foci, asymptotes, and eccentricity, and when appropriate, use technology</p>	<p>Algebra 2: SE/TE: 614-620, 622-629, 630-636, 638-644, 645-652, 653-660 TE: 620A, 621, 629A, 636A, 644A, 652A, 660A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.IF.4 Interpret functions that arise in applications in terms of the context. 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.*</p>	<p>AR.9-12.PRF.PCT.1.1 (PRF.1.PCT.1) Investigate and sketch, with and without appropriate technology, the graphs of polynomial and rational functions using the characteristics of domain and range, upper and lower bounds, maximum and minimum points, asymptotes and end behavior, zeros, multiplicity of zeros, y-intercepts, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558, 705-712 TE: 558A Lesson Resources, 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 281-283, 289-292, 515-520</p>
	<p>AR.9-12.PRF.PCT.1.4 (PRF.1.PCT.4) Apply the concepts of polynomial and rational functions to model real world situations using appropriate technology when needed</p>	<p>Algebra 1: SE/TE: 551, 552, 565, 570, 571</p> <p>Algebra 2: SE/TE: 331-338, 520, 521, 544, 547 TE: 338A Lesson Resources</p>
<p>CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. 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.*</p>	<p>AR.9-12.LF.AI.3.2 (LF.3.AI.2) Determine domain and range of a relation from an algebraic expression, graphs, set of ordered pairs, or table of data</p>	<p>Algebra 1: SE/TE: 268-273 TE: 273A Lesson Resources</p> <p>Algebra 2: SE/TE: 62, 334, 398-399, 408-411 TE: 425</p>
	<p>AR.9-12.LF.AI.3.3 (LF.3.AI.3) Know and/or use function notation, including evaluating functions for given values in their domain</p>	<p>Algebra 1: SE/TE: 263, 269</p> <p>Algebra 2: SE/TE: 63-65, 70, 407</p>
	<p>AR.9-12.RF.AII.1.1 (RF.1.AII.1) Determine, with or without technology, the domain and range of a relation defined by a graph, a table of values, or a symbolic equation including those with restricted domains and whether a relation is a function</p>	<p>Algebra 1: SE/TE: 268-271</p> <p>Algebra 2: SE/TE: 60-67 TE: 67A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.IF.5 Interpret functions that arise in applications in terms of the context. 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.*</p>	<p>AR.9-12.LF.AC.2.4 (LF.2.AC.4) Interpret the rate of change (slope) and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300</p> <p>Geometry: SE/TE: 189-196 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 447, 437, 500-504</p>
	<p>AR.9-12.ELF.PCT.2.3 (ELF.2.PCT.3) Solve graphically, algebraically and numerically, with and without appropriate technology, equations and real world problems involving exponential and logarithmic expressions</p>	<p>Algebra 1: SE/TE: 460-464</p> <p>Algebra 2: SE/TE: 437, 469-476, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources</p>
<p>CC.9-12.F.IF.6 Interpret functions that arise in applications in terms of the context. 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.*</p>	<p>AR.9-12.LF.AI.3.5 (LF.3.AI.5) Interpret the rate of change/slope and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300</p> <p>Algebra 2: SE/TE: 147, 437, 500-504</p>
	<p>AR.9-12.LF.AI.3.6 (LF.3.AI.6) Calculate the slope given: -- two points, -- the graph of a line, -- the equation of a line</p>	<p>Algebra 1: SE/TE: 296-299 TE: 300A Lesson Resources</p> <p>Algebra 2: SE/TE: 77-80, 81-88 TE: 88A, 80A</p>
	<p>AR.9-12.SEI.AI.2.8 (SEI.2.AI.8) Communicate real world problems graphically, algebraically, numerically and verbally</p>	<p>Algebra 1: SE/TE: 182, 212, 294, 354</p> <p>Algebra 2: SE/TE: 92-98 TE: 98A</p>
	<p>AR.9-12.LF.AC.2.4 (LF.2.AC.4) Interpret the rate of change (slope) and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300</p> <p>Geometry: SE/TE: 189-196 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 447, 437, 500-504</p>

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(Continued) CC.9-12.F.IF.6 Interpret functions that arise in applications in terms of the context. 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.*	AR.9-12.LF.TM.1.2 (LF.1.TM.2) Determine the initial condition and the rate of change in real-world situations described by $y = mx + b$	Algebra 1: SE/TE: 311-314 Algebra 2: SE/TE: 93-98
CC.9-12.F.IF.7 Analyze functions using different representations. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.*	AR.9-12.LF.TM.1.4 (LF.1.TM.4) Explain, conjecture, summarize, and defend results orally, in writing and through the use of appropriate technology	Algebra 1: SE/TE: 270-271, 248, 250, 450, 455, 458, 600, 607, 617, 624, 637, 642 Algebra 2: SE/TE: 92-98, 180, 227, 887
	AR.9-12.EF.TM.2.6 (EF.2.TM.6) Explain, conjecture, summarize, and defend results orally, in writing, and through the use of appropriate technology	Algebra 1: SE/TE: 270-271, 248, 250, 450, 455, 458, 600, 607, 617, 624, 637, 642 Algebra 2: SE/TE: 92-98, 180, 227, 887
	AR.9-12.MM.TM.3.4 (MM.3.TM.4) Explain, conjecture, summarize, and defend results orally, in writing, and through the use of appropriate technology	Algebra 1: SE/TE: 270-271, 248, 250, 450, 455, 458, 600, 607, 617, 624, 637, 642 Algebra 2: SE/TE: 92-98, 180, 227, 887
CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.*	AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula	Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources Geometry: SE/TE: TE: 439 Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A

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(Continued) CC.9-12.F.IF.7a Graph linear and quadratic functions and show intercepts, maxima, and minima.*	AR.9-12.QEF.AII.3.6 (QEF.3.AII.6) Apply the concepts of quadratic equations and functions to model real world situations by using appropriate technology when needed	Algebra 1: SE/TE: 563, 570-571, 578, 584 Algebra 2: SE/TE: 331-337 TE: 338A
	AR.9-12.NLF.AI.4.2 (NLF.4.AI.2) Determine minimum, maximum, vertex, and zeros, given the graph	Algebra 1: SE/TE: 546-551, 553-558 Algebra 2: SE/TE: 194-196, 290-292
CC.9-12.F.IF.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*	AR.9-12.RF.AII.1.5 (RF.1.AII.5) Graph, with and without appropriate technology, functions defined as piece-wise and step	Algebra 1: SE/TE: 348 Algebra 2: SE/TE: 90-91
	AR.9-12.LEI.AII.2.1 (LEI.2.AII.1) Solve, with and without appropriate technology, absolute value equations and inequalities written in one or two variables, and graph solutions.	Algebra 1: SE/TE: 207-213 Geometry: SE/TE: 892 Algebra 2: SE/TE: 41-48, 107-113 TE: 48A, 90A, 113A
	AR.9-12.LQF.AIII.1.6 (LQF.1.AIII.6) Graph, with and without appropriate technology, functions defined as piece-wise and step	Algebra 1: SE/TE: 348 Algebra 2: SE/TE: 90-91

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<p>(Continued) CC.9-12.F.IF.7b Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.*</p>	<p>AR.9-12.PRF.AIII.2.2 (PRF.2.AIII.2) Investigate and sketch the graphs of polynomial and rational functions using the characteristics of domain and range, upper and lower bounds, maximum and minimum points, asymptotes and end behavior, zeros, multiplicity of zeros, y-intercepts, and symmetry with and without appropriate technology</p>	<p>Algebra 1: SE/TE: 546-551, 553-558, 705-712 TE: 558A Lesson Resources, 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 280-287, 515-523 TE: 287A, 523A Lesson Resources</p>
	<p>AR.9-12.LF.AC.2.8 (LF.2.AC.8) Graph, with and without appropriate technology, functions defined as piecewise and step</p>	<p>Algebra 1: SE/TE: 348</p> <p>Algebra 2: SE/TE: 90-91</p>
<p>CC.9-12.F.IF.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.*</p>	<p>AR.9-12.PRF.AII.4.2 (PRF.4.AII.2) Analyze and sketch, with and without appropriate technology, the graph of a given polynomial function, determining the characteristics of domain and range, maximum and minimum points, end behavior, zeros, multiplicity of zeros, y-intercept, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558</p> <p>Algebra 2: SE/TE: 194-196, 290-292</p>
	<p>AR.9-12.PRF.AII.4.5 (PRF.4.AII.5) Identify the characteristics of graphs of power functions of the form $f(x) = ax^n$, for negative integral values of n, including domain, range, end behavior, and behavior at $x = 0$, and compare these characteristics to the graphs of related positive integral power functions</p>	<p>Algebra 2: SE/TE: 339-345 TE: 345A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.IF.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.*</p>	<p>AR.9-12.PRF.AIII.2.2 (PRF.2.AIII.2) Investigate and sketch the graphs of polynomial and rational functions using the characteristics of domain and range, upper and lower bounds, maximum and minimum points, asymptotes and end behavior, zeros, multiplicity of zeros, y-intercepts, and symmetry with and without appropriate technology</p>	<p>Algebra 1: SE/TE: 546-551, 553-558, 705-712 TE: 558A Lesson Resources, 712A Lesson Resources</p> <p>Geometry: SE/TE: 257</p> <p>Algebra 2: SE/TE: 134-141, 142-148 TE: 141A, 148A Lesson Resources</p>
	<p>AR.9-12.PRF.PCT.1.1 (PRF.1.PCT.1) Investigate and sketch, with and without appropriate technology, the graphs of polynomial and rational functions using the characteristics of domain and range, upper and lower bounds, maximum and minimum points, asymptotes and end behavior, zeros, multiplicity of zeros, y-intercepts, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558, 705-712 TE: 558A Lesson Resources, 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 281-283, 289-292, 515-520</p>
	<p>AR.9-12.PRF.AIII.2.4 (PRF.2.AIII.4) Describe, with and without appropriate technology, the fundamental characteristics of rational functions: zeros, discontinuities (including vertical asymptotes), and end behavior (including horizontal asymptotes)</p>	<p>Algebra 1: SE/TE: 705-712 TE: 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 282-283, 435, 515-523, 524-525 TE: 523A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.IF.7c Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.*</p>	<p>AR.9-12.PRF.PCT.1.1 (PRF.1.PCT.1) Investigate and sketch, with and without appropriate technology, the graphs of polynomial and rational functions using the characteristics of domain and range, upper and lower bounds, maximum and minimum points, asymptotes and end behavior, zeros, multiplicity of zeros, y-intercepts, and symmetry</p>	<p>Algebra 1: SE/TE: 546-551, 553-558, 705-712 TE: 558A Lesson Resources, 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 281-283, 289-292, 515-520</p>
<p>CC.9-12.F.IF.7d (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.*</p>	<p>AR.9-12.PRF.PCT.1.3 (PRF.1.PCT.3) Describe, with and without appropriate technology, the fundamental characteristics of rational functions: zeros, discontinuities (including vertical asymptotes), and end behavior (including horizontal asymptotes)</p>	<p>Algebra 1: SE/TE: 705-712 TE: 712A Lesson Resources</p> <p>Algebra 2: SE/TE: 282-283, 435, 515-523, 524-525 TE: 523A Lesson Resources</p>
<p>CC.9-12.F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.*</p>	<p>AR.9-12.ELF.AII.5.2 (ELF.5.AII.2) Graph exponential functions and identify key characteristics: domain, range, intercepts, asymptotes, and end behavior</p>	<p>Algebra 1: SE/TE: 455, 460-463</p> <p>Algebra 2: SE/TE: 434-441, 442-450 TE: 441A, 450A Lesson Resources</p>
	<p>AR.9-12.ELF.AIII.3.5 (ELF.3.AIII.5) Draw and analyze, with and without appropriate technology, graphs of logarithmic and exponential functions</p>	<p>Algebra 1: SE/TE: 453-459, 460-464 TE: 459A Lesson Resources</p> <p>Algebra 2: SE/TE: 469-476, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources</p>
	<p>AR.9-12.EF.TDM.4.1 (EF.4.TDM.1) Draw and recognize the graphs of logarithmic and exponential functions, with and without appropriate technology</p>	<p>Algebra 1: SE/TE: 453-459, 460-464 TE: 459A Lesson Resources</p> <p>Algebra 2: SE/TE: 469-476, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.IF.7e Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.*</p>	<p>AR.9-12.ELF.PCT.2.5 (ELF.2.PCT.5) Draw and analyze, with and without appropriate technology, graphs of logarithmic and exponential function</p>	<p>Algebra 1: SE/TE: 453-459, 460-464 TE: 459A Lesson Resources</p> <p>Algebra 2: SE/TE: 469-476, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources</p>
	<p>AR.9-12.TF.PCT.5.7 (TF.5.PCT.7) Graph the six trigonometric functions, identify domain, range, intercepts, period, amplitude, and asymptotes as applicable and use symmetry to determine whether the function is even or odd through appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 851-858, 861-867, 868-874, 883, 886 TE: 858A, 867A, 874A Lesson Resources</p>
	<p>AR.9-12.TF.PCT.5.8 (TF.5.PCT.8) Determine, with and without appropriate technology, the amplitude, period, phase shift, and vertical shift, and sketch the graph of transformations of the trigonometric functions</p>	<p>Algebra 2: SE/TE: 875-882 TE: 882A Lesson Resources</p>
	<p>AR.9-12.RF.AII.1.7 (RF.1.AII.7) Investigate and identify key characteristics of period functions and their graphs (period, amplitude, maximum, and minimum)</p>	<p>Algebra 2: SE/TE: 853-854, 856, 862, 865</p>
	<p>AR.9-12.RF.AII.1.6 (RF.1.AII.6) Recognize periodic phenomena (sine or cosine functions such as sound waves, length of daylight, circular motion)</p>	<p>Algebra 2: SE/TE: 855, 857, 858, 863, 864, 866</p>
<p>CC.9-12.F.IF.8 Analyze functions using different representations. Write a function defined by an expression in different but equivalent forms to reveal and</p>	<p>AR.9-12.PS.CM.1.2 (PS.1.CM.2) Write an algorithm to solve mathematical problems using formulas, equations, and functions.</p>	<p>Studied in 4th Year course</p>

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explain different properties of the function.	AR.9-12.ELF.PCT.2.2 (ELF.2.PCT.2) Develop and apply the laws of logarithms and the change-of-base formula to simplify and evaluate expressions	Algebra 2: SE/TE: 462-467, 469-475, 478-481
CC.9-12.F.IF.8a 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.	AR.9-12.LQF.AIII.1.5 (LQF.1.AIII.5) Solve, with and without appropriate technology, quadratic equations by: -- extracting the square root, -- graphing, -- factoring, -- completing the square, -- using the quadratic formula	Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources Algebra 2: SE/TE: 219-223, 226-231, 233-239 TE: 239A, 231A Lesson Resources
	AR.9-12.NLF.AI.4.3 (NLF.4.AI.3) Solve quadratic equations using the appropriate methods with and without technology: -- factoring, -- quadratic formula with real number solutions	Algebra 1: SE/TE: 568-572, 582-588 Algebra 2: SE/TE: 218-220, 226-231, 233-239, 240-247
	AR.9-12.NLF.AI.4.4 (NLF.4.AI.4) Recognize function families and their connections including vertical shift and reflection over the x-axis: -- quadratics (with rational coefficients), -- absolute value, -- exponential functions	Algebra 1: SE/TE: 347, 562, 553 TE: 350A Lesson Resources Algebra 2: SE/TE: 99-106, 108-110, 203, 415, 455, 877 TE: 106A Lesson Resources

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<p>(Continued) CC.9-12.F.IF.8a 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.</p>	<p>AR.9-12.QEF.AII.3.3 (QEF.3.AII.3) Analyze and solve quadratic equations with and without appropriate technology by: -- factoring, -- graphing, -- extracting the square root, -- completing the square, -- using the quadratic formula</p>	<p>Algebra 1: SE/TE: 561-564, 568-572, 576-580, 582-588 TE: 572A Lesson Resources, 581A Lesson Resources, 588A Lesson Resources</p> <p>Geometry: TE: 439</p> <p>Algebra 2: SE/TE: 216-223, 226-231, 233-239, 240-247 TE: 223A, 231A, 239A, 247A Lesson Resources</p>
	<p>AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically</p>	<p>Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 194-201, 203-204, 209-211, 232, 242-243, 268</p>
	<p>AR.9-12.NF.AC.4.1 (NF.4.AC.1) Factor polynomials: -- greatest common factor, -- binomials (difference of squares), -- trinomials, -- combinations of the above</p>	<p>Algebra 1: SE/TE: 492-496, 512-517, 518-522, 523-528, 529-533 TE: 496A Lesson Resources, 517A Lesson Resources, 522A Lesson Resources, 528A Lesson Resources, 533A Lesson Resources</p> <p>Algebra 2: SE/TE: 218-220, 234-235, 297-301</p>

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<p>CC.9-12.F.IF.8b 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 and decay.</p>	<p>AR.9-12.ELF.AII.5.3 (ELF.5.AII.3) Identify the effect that changes in the parameters of the base have on the graph of the exponential function</p>	<p>Algebra 1: SE/TE: 460-463</p> <p>Algebra 2: SE/TE: 435, 443, 444, 447</p>
	<p>AR.9-12.ELF.AII.5.4 (ELF.5.AII.4) Recognize and solve problems that can be modeled using exponential functions</p>	<p>Algebra 1: SE/TE: 455, 461-465, 591</p> <p>Algebra 2: SE/TE: 434, 440, 448-449, 471</p>
	<p>AR.9-12.EF.TDM.4.3 (EF.4.TDM.3) Use the change of base formula to simplify and evaluate logarithmic expressions, using technology</p>	<p>Algebra 2: SE/TE: 464, 466</p>
<p>CC.9-12.F.IF.9 Analyze functions using different representations. 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.</p>	<p>AR.9-12.LF.AI.3.9 (LF.3.AI.9) Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa</p>	<p>Algebra 1: SE/TE: 308-312</p> <p>Geometry: SE/TE: 189-195 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 77-80, 81-88 TE: 88A, 80A Lesson Resources</p>
	<p>AR.9-12.SEI.AC.3.2 (SEI.3.AC.2) SLE 2. Solve, with and without appropriate technology, systems of two linear equations and systems of two inequalities numerically, algebraically and graphically</p>	<p>Algebra 1: SE/TE: 364-368, 372-376, 378-383, 400-404 TE: 363A, 369A, 377A Lesson Resources</p> <p>Algebra 2: SE/TE: 134-141, 142-148, 157-162 TE: 162A, 141A, 148A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.IF.9 Analyze functions using different representations. 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.</p>	<p>AR.9-12.LF.TM.1.3 (LF.1.TM.3) Make inferences and predictions using: -- recursion on the table, -- inspection on the graph, -- algebraic manipulation on the model</p>	<p>Algebra 1: SE/TE: 253-255</p> <p>Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566</p>
	<p>AR.9-12.EF.TM.2.4 (EF.2.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model</p>	<p>Algebra 1: SE/TE: 253-255</p> <p>Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566</p>
	<p>AR.9-12.MM.TM.3.3 (MM.3.TM.3) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, - - algebraic manipulation on the model</p>	<p>Algebra 1: SE/TE: 253-255</p> <p>Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566</p>
	<p>AR.9-12.PS.TM.4.4 (PS.4.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model</p>	<p>Algebra 1: SE/TE: 253-255</p> <p>Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566</p>
<p>CC.9-12.F.BF.1 Build a function that models a relationship between two quantities. Write a function that describes a</p>	<p>AR.9-12.PS.CM.1.4 (PS.1.CM.4) Write an algorithm from a mathematical model.</p>	<p>Studied in 4th year course.</p>

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relationship between two quantities.*	AR.9-12.PS.CM.1.2 (PS.1.CM.2) Write an algorithm to solve mathematical problems using formulas, equations, and functions.	Studied in 4th year course.
	AR.9-12.SS.PCT.4.1 (SS.4.PCT.1) Develop, with and without appropriate technology, a representation of sequences recursively	Algebra 1: SE/TE: 275-281, 467-471 TE: 472A, 281A Lesson Resources Algebra 2: TE: 578
	AR.9-12.PS.CM.1.2 (PS.1.CM.2) Write an algorithm to solve mathematical problems using formulas, equations, and functions.	Studied in 4th year course.
	AR.9-12.SS.AIII.4.3 (SS.4.AIII.3) Solve, with and without appropriate technology, problems involving the sum (including Sigma notation) of finite and infinite sequences and series	Algebra 2: SE/TE: 572-577, 580-586
	AR.9-12.PI.CM.3.2 (PI.3.CM.2) Create functions using recursions and loops.	Algebra 1: SE/TE: 275, 469 Algebra 2: SE/TE: 572, 580
CC.9-12.F.BF.1a Determine an explicit expression, a recursive process, or steps for calculation from a context.	AR.9-12.SS.PCT.4.1 > AR.9-12.SS.PCT.4.1 (SS.4.PCT.1) Develop, with and without appropriate technology, a representation of sequences recursively [Grade Level 9-12]	Algebra 1: SE/TE: 275-281, 467-471 TE: 472A, 281A Lesson Resources Algebra 2: TE: 578

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	AR.9-12.PS.CM.1.2 > AR.9-12.PS.CM.1.2 (PS.1.CM.2) Write an algorithm to solve mathematical problems using formulas, equations, and functions. [Grade Level 9-12]	Studied in 4th year course.
	AR.9-12.SS.AIII.4.3 > AR.9-12.SS.AIII.4.3 (SS.4.AIII.3) Solve, with and without appropriate technology, problems involving the sum (including Sigma notation) of finite and infinite sequences and series [Grade Level 9-12]	Algebra 2: SE/TE: 572-577, 580-586
	AR.9-12.PI.CM.3.2 > AR.9-12.PI.CM.3.2 (PI.3.CM.2) Create functions using recursions and loops. [Grade Level 9-12]	Algebra 1: SE/TE: 275, 469 Algebra 2: SE/TE: 572, 580
CC.9-12.F.BF.1b 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.	AR.9-12.SS.PCT.4.2 (SS.4.PCT.2) Define and discriminate between arithmetic and geometric sequences and series and use appropriate technology when needed	Algebra 1: SE/TE: 274-275, 468-469 Algebra 2: SE/TE: 572-577, 580-586, 587-592, 595-600 TE: 577A, 586A, 593A, 601A Lesson Resources
	AR.9-12.PS.CM.1.4 (PS.1.CM.4) Write an algorithm from a mathematical model.	Studied in 4th year course.

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	AR.9-12.LQF.AIII.1.1 (LQF.1.AIII.1) Evaluate, add, subtract, multiply, divide and compose functions and determine appropriate domain and range restrictions	Algebra 1: SE/TE: 454-455, 460-461, 478 Algebra 2: SE/TE: 398-404
CC.9-12.F.BF.1c (+) Compose functions. For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.	AR.9-12.LQF.AIII.1.1 (LQF.1.AIII.1) Evaluate, add, subtract, multiply, divide and compose functions and determine appropriate domain and range restrictions	Algebra 1: SE/TE: 263, 311, 461 Algebra 2: SE/TE: 398-404
CC.9-12.F.BF.2 Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*	AR.9-12.SS.AIII.4.1 (SS.4.AIII.1) Develop, with and without appropriate technology, a representation of sequences recursively and explicitly	Algebra 1: SE/TE: 274-281, 467-472 TE: 281A Lesson Resources, 472A Lesson Resources Algebra 2: SE/TE: 572-577, 580-586
	AR.9-12.SS.AIII.4.2 (SS.4.AIII.2) Define and discriminate, with and without appropriate technology, between arithmetic and geometric sequences and series	Algebra 1: SE/TE: 274-281, 467-472 TE: 281A Lesson Resources, 472A Lesson Resources Algebra 2: SE/TE: 572-577, 580-586

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	AR.9-12.NF.AC.4.5 (NF.4.AC.5) Identify and apply nonlinear functions to real world situations such as acceleration, area, volume, population, bacteria, compound interest, percent depreciation and appreciation, amortization, geometric sequences, etc.	Algebra 1: SE/TE: 236, 238, 244, 245, 250, 251, 258, 262, 264, 265, 266, 271, 272 Algebra 2: SE/TE: 471, 474-476, 480, 482-483
	AR.9-12.SS.PCT.4.4 (SS.4.PCT.4) Determine the n th term of a sequence given a rule or specific terms and use appropriate technology when needed	Algebra 1: SE/TE: 274-276, 467-469 Algebra 2: SE/TE: 573, 575, 581
	AR.9-12.SS.PCT.4.2 (SS.4.PCT.2) Define and discriminate between arithmetic and geometric sequences and series and use appropriate technology when needed	Algebra 1: SE/TE: 274-281, 467-472 TE: 281A Lesson Resources, 472A Lesson Resources Algebra 2: SE/TE: 572-577, 580-586, 587-592, 595-600 TE: 577A, 586A, 593A, 601A Lesson Resources
(Continued) CC.9-12.F.BF.2 Build a function that models a relationship between two quantities. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*	AR.9-12.PI.CM.3.2 (PI.3.CM.2) Create functions using recursions and loops.	Algebra 1: SE/TE: 275, 469 Algebra 2: SE/TE: 572, 580
	AR.9-12.SS.PCT.4.5 (SS.4.PCT.5) Use, with and without appropriate technology, sequences and series to solve real world problems	Algebra 1: SE/TE: 277, 279, 469, 471 Algebra 2: SE/TE: 574, 576, 582, 584, 585, 592, 600 TE: 586A Lesson Resources
	AR.9-12.SS.AIII.4.4 (SS.4.AIII.4) Determine, with and without appropriate technology, the n th term of a sequence given a rule or specific terms	Algebra 1: SE/TE: 274-276, 467-469 Algebra 2: SE/TE: 573, 575, 581, 584

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	<p>AR.9-12.SS.AIII.4.5 (SS.4.AIII.5) Use, with and without appropriate technology, sequences and series to solve real world problems</p>	<p>Algebra 1: SE/TE: 277, 279, 469, 471</p> <p>Algebra 2: SE/TE: 574, 576, 582, 584, 585, 592, 600 TE: 586A Lesson Resources</p>
<p>CC.9-12.F.BF.3 Build new functions from existing functions. 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.</p>	<p>AR.9-12.RF.AII.1.4 (RF.1.AII.4) Analyze and report, with and without appropriate technology, the effect of changing coefficients, exponents, and other parameters on functions and their graphs (linear, quadratic, and higher degree polynomial)</p>	<p>Algebra 1: SE/TE: 242, 246-247, 308-313, 546-551, 553-558, 675 TE: 313A Lesson Resources, 552A Lesson Resources, 558A Lesson Resources</p> <p>Algebra 2: SE/TE: 99-100, 194-198, 339-341</p>
	<p>AR.9-12.NF.AC.4.6 (NF.4.AC.6) Recognize function families including vertical shifts, horizontal shifts and reflections over the x-axis</p>	<p>Algebra 1: SE/TE: 347, 562, 553</p> <p>Algebra 2: SE/TE: 99-106, 108-110, 203, 415, 455, 877 TE: 106A Lesson Resources</p>

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	AR.9-12.NLF.AI.4.4 (NLF.4.AI.4) Recognize function families and their connections including vertical shift and reflection over the x-axis: -- quadratics (with rational coefficients), -- absolute value, -- exponential functions	Algebra 1: SE/TE: 347, 562, 553 Algebra 2: SE/TE: 99-106, 108-110, 203, 415, 455, 877 TE: 106A Lesson Resources
	AR.9-12.TF.PCT.5.8 (TF.5.PCT.8) Determine, with and without appropriate technology, the amplitude, period, phase shift, and vertical shift, and sketch the graph of transformations of the trigonometric functions	Algebra 2: SE/TE: 875-882 TE: 882A Lesson Resources
	AR.9-12.EF.TDM.4.2 (EF.4.TDM.2) Apply properties of logarithms to convert and solve logarithmic (common and natural) and exponential equations	Algebra 2: SE/TE: 462-467, 469-475, 468-481, 489
CC.9-12.F.BF.4 Find inverse functions	No Matches in Arkansas Frameworks	Algebra 1: TE: 329 Algebra 2: SE/TE: 405-412 TE: 412A Lesson Resources
CC.9-12.F.BF.4a 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, $f(x) = 2(x^3)$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$ (x not equal to 1).	AR.9-12.RF.AII.1.3 (RF.1.AII.3) Determine the inverse of a function (Graph, with and without appropriate technology, functions and their inverses)	Algebra 1: TE: 329 Algebra 2: SE/TE: 405-412 TE: 412A Lesson Resources
CC.9-12.F.BF.4b (+) Verify by composition that one function is the inverse of another.	No Matches in Arkansas Frameworks	Algebra 2: SE/TE: 409

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CC.9-12.F.BF.4c (+) Read values of an inverse function from a graph or a table, given that the function has an inverse.	No Matches in Arkansas Frameworks	Algebra 2: SE/TE: 405-406, 410
CC.9-12.F.BF.4d (+) Produce an invertible function from a non-invertible function by restricting the domain.	AR.9-12.TF.PCT.5.9 (TF.5.PCT.9) Identify and graph, with and without appropriate technology, the inverse of trigonometric functions including the restrictions on the domain	Algebra 2: SE/TE: 911-917 TE: 918A Lesson Resources
CC.9-12.F.BF.5 (+) Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.	AR.9-12.ELF.AII.5.5 (ELF.5.AII.5) Establish the relationship between exponential and logarithmic functions	Algebra 2: SE/TE: 451, 454
	AR.9-12.ELF.AII.5.6 (ELF.5.AII.6) Evaluate simple logarithms using the definition	Algebra 2: SE/TE: 452
	AR.9-12.ELF.AIII.3.1 (ELF.3.AIII.1) Establish the inverse relationship between exponential and logarithmic functions	Algebra 2: SE/TE: 451, 454
	AR.9-12.ELF.PCT.2.1 (ELF.2.PCT.1) Establish the inverse relationship between exponential and logarithmic functions	Algebra 2: SE/TE: 451, 454

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	AR.9-12.ELF.PCT.2.3 (ELF.2.PCT.3) Solve graphically, algebraically and numerically, with and without appropriate technology, equations and real world problems involving exponential and logarithmic expressions	Algebra 2: SE/TE: 437, 469-476, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources
	AR.9-12.ELF.AII.5.7 (ELF.5.AII.7) Use properties of logarithms to manipulate logarithmic expressions	Algebra 2: SE/TE: 462-467, 469-475
	AR.9-12.F.TFM.5.2 (F.5.TFM.2) Apply properties of logarithms to convert and solve logarithmic (common and natural) and exponential equations	Algebra 2: SE/TE: 462-467, 469-475, 468-481, 489
CC.9-12.F.LE.1 Construct and compare linear, quadratic, and exponential models and solve problems. Distinguish between situations that can be modeled with linear functions and with exponential functions.*	AR.9-12.EF.TM.2.3 (EF.2.TM.3) Compare and contrast linear and exponential models	Algebra 2: SE/TE: 83, 436
	AR.9-12.EF.TM.2.2 (EF.2.TM.2) Compare exponential models	Algebra 1: SE/TE: 261-262 Algebra 2: SE/TE: 436-438
CC.9-12.F.LE.1a Prove that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.*	AR.9-12.LF.AI.3.5 (LF.3.AI.5) Interpret the rate of change/slope and intercepts within the context of everyday life	Algebra 1: SE/TE: 294-300 Geometry: SE/TE: 189-195 Algebra 2: SE/TE: 70, 501-502, 504

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	AR.9-12.ELF.AIII.3.5 (ELF.3.AIII.5) Draw and analyze, with and without appropriate technology, graphs of logarithmic and exponential functions	Algebra 1: SE/TE: 453-459, 460-464 Algebra 2: SE/TE: 469-476, 478-483 TE: 476A Lesson Resources, 483A Lesson Resources
	AR.9-12.F.TFM.5.3 (F.5.TFM.3) Solve real-world problems involving: -- compound interest, -- amortization, -- annuities, -- appreciation, -- depreciation, -- investments	Algebra 1: SE/TE: 675, 478, 461, 462 Algebra 2: SE/TE: 436-437, 447-449
CC.9-12.F.LE.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*	AR.9-12.SEI.AI.2.6 (SEI.2.AI.6) Solve problems involving direct variation and indirect (inverse) variation to model rates of change	Algebra 1: SE/TE: 698-704 TE: 704A Lesson Resources Algebra 2: SE/TE: 68-72, 498-504 TE: 73A Lesson Resources, 505A Lesson Resources
	AR.9-12.LF.AC.2.4 (LF.2.AC.4) Interpret the rate of change (slope) and intercepts within the context of everyday life	Algebra 1: SE/TE: 294-300 Geometry: SE/TE: 189-196 TE: 196A Lesson Resources Algebra 2: SE/TE: 447, 437, 500-504

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	AR.9-12.LF.TM.1.1 (LF.1.TM.1) Identify a linear relationship represented by a table, by a graph, and by symbolic forms	Algebra 1: SE/TE: 240-242, 246-247, 308 Algebra 2: SE/TE: 68-70
	AR.9-12.LF.TM.1.2 (LF.1.TM.2) Determine the initial condition and the rate of change in real-world situations described by $y = mx + b$	Algebra 1: SE/TE: 311-314 Algebra 2: SE/TE: 93-98
CC.9-12.F.LE.1c Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.*	AR.9-12.ELF.AII.5.1 (ELF.5.AII.1) Recognize the graphs of exponential functions distinguishing between growth and decay	Algebra 1: SE/TE: 460-462 Algebra 2: SE/TE: 434-441 TE: 441A Lesson Resources
	AR.9-12.NF.AC.4.5 (NF.4.AC.5) Identify and apply nonlinear functions to real world situations such as acceleration, area, volume, population, bacteria, compound interest, percent depreciation and appreciation, amortization, geometric sequences, etc.	Algebra 1: SE/TE: 236, 238, 244, 245, 250, 251, 258, 262, 264, 265, 266, 271, 272 Algebra 2: SE/TE: 471, 474-476, 480, 482-483

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	<p>AR.9-12.EF.TM.2.1 (EF.2.TM.1) Identify exponential growth or decay by creating tables, graphs, and mathematical models</p>	<p>Algebra 1: SE/TE: 589-594 TE: 594A Lesson Resources</p> <p>Algebra 2: SE/TE: 434-441</p>
<p>CC.9-12.F.LE.2 Construct and compare linear, quadratic, and exponential models and solve problems. 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).*</p>	<p>AR.9-12.LF.AI.3.8 (LF.3.AI.8) *Write an equation in slope-intercept, point-slope, and standard forms given: -- two points, -- a point and y-intercept, -- x-intercept and y-intercept, -- a point and slope, -- a table of data, -- the graph of a line</p>	<p>Algebra 1: SE/TE: 308-313, 315-320, 322-329 TE: 314A, 320A, 328A Lesson Resources</p> <p>Algebra 2: SE/TE: 74-80, 81-88 TE: 80A, 88A Lesson Resources</p>

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<p>(Continued) CC.9-12.F.LE.2 Construct and compare linear, quadratic, and exponential models and solve problems. 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).*</p>	<p>AR.9-12.LF.AC.2.7 (LF.2.AC.7) Write an equation given: -- two points, -- a point and y-intercept, -- an x-intercept and y-intercept, -- a point and slope, -- a table of data, -- the graph of a line</p>	<p>Algebra 1: SE/TE: 336-343, 308-313, 315-320, 322-329 TE: 343A, 314A, 320A, 328A Lesson Resources</p> <p>Geometry: SE/TE: 189-195 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 77-80, 81-88 TE: 88A, 80A Lesson Resources</p>
	<p>AR.9-12.SEI.AC.3.6 (SEI.3.AC.6) SLE 6. Apply linear, piece-wise and step functions to real world situations that involve a combination of rates, proportions and percents such as sales tax, simple interest, social security, constant depreciation and appreciation, arithmetic sequences, constant rate of change, income taxes, postage, utility bills, commission, and traffic tickets</p>	<p>Algebra 1: SE/TE: 8, 169, 249-242, 348, 462</p> <p>Algebra 2: SE/TE: 64, 84, 90-91, 576</p>
	<p>AR.9-12.NF.AC.4.5 (NF.4.AC.5) Identify and apply nonlinear functions to real world situations such as acceleration, area, volume, population, bacteria, compound interest, percent depreciation and appreciation, amortization, geometric sequences, etc.</p>	<p>Algebra 1: SE/TE: 236, 238, 244, 245, 250, 251, 258, 262, 264, 265, 266, 271, 272</p> <p>Algebra 2: SE/TE: 471, 474-476, 480, 482-483</p>
	<p>AR.9-12.LF.TM.1.1 (LF.1.TM.1) Identify a linear relationship represented by a table, by a graph, and by symbolic forms</p>	<p>Algebra 1: SE/TE: 675, 478, 461, 462</p> <p>Algebra 2: SE/TE: 68-70</p>

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	AR.9-12.EF.TM.2.1 (EF.2.TM.1) Identify exponential growth or decay by creating tables, graphs, and mathematical models	Algebra 1: SE/TE: 589-594 TE: 594A Lesson Resources Algebra 2: SE/TE: 434-441
	AR.9-12.EF.TM.2.2 (EF.2.TM.2) Compare exponential models	Algebra 1: SE/TE: 261-262 Algebra 2: SE/TE: 436-438
CC.9-12.F.LE.3 Construct and compare linear, quadratic, and exponential models and solve problems. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial	AR.9-12.NLF.AI.4.5 (NLF.4.AI.5) Communicate real world problems graphically, algebraically, numerically and verbally	Algebra 1: SE/TE: 182, 212, 294, 354 Algebra 2: SE/TE: 92-98, 445, 477, 434, 437, 438, 211
(Continued) CC.9-12.F.LE.3 Construct and compare linear, quadratic, and exponential models and solve problems. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.*	AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically	Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 TE: 552A Lesson Resources, 558A Lesson Resources Algebra 2: SE/TE: 194-201, 203-204, 209-211, 232, 242-243, 268

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	AR.9-12.PRF.AII.4.3 (PRF.4.AII.3) Write the equation of a polynomial function given its roots	Algebra 1: SE/TE: 573 Algebra 2: SE/TE: 232
	AR.9-12.PRF.AII.4.4 (PRF.4.AII.4) Identify the equation of a polynomial function given its graph or table	Algebra 2: SE/TE: 283-284
CC.9-12.F.LE.4 Construct and compare linear, quadratic, and exponential models and solve problems. 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.* (Continued) CC.9-12.F.LE.4 Construct and compare linear, quadratic, and exponential models and solve problems. 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.*	AR.9-12.ELF.AII.5.4 (ELF.5.AII.4) Recognize and solve problems that can be modeled using exponential functions	Algebra 1: SE/TE: 455,461-465, 591 Algebra 2: SE/TE: 436-440, 471, 474-476 TE: 441A Lesson Resources
	AR.9-12.ELF.AII.5.6 (ELF.5.AII.6) Evaluate simple logarithms using the definition	Algebra 2: SE/TE: 452
	AR.9-12.ELF.AIII.3.2 (ELF.3.AIII.2) Develop and apply, with and without appropriate technology, the laws of logarithms and the change-of-base formula to simplify and evaluate expressions	Algebra 2: SE/TE: 462-467 TE: 468A Lesson Resources
	AR.9-12.EF.TDM.4.2 (EF.4.TDM.2) Apply properties of logarithms to convert and solve logarithmic (common and natural) and exponential equations	Algebra 2: SE/TE: 462-467, 469-475, 468-481, 489
	AR.9-12.EF.TDM.4.5 (EF.4.TDM.5) Recognize and apply properties of logarithmic functions to solve real-world problems (e.g., Richter scale pH, decibel scale, bacterial growth, radioactive decay, Newton's Law of Cooling)	Algebra 2: SE/TE: 453, 456, 457, 465, 471, 474, 475, 477, 480, 481, 482 TE: 484 Lesson Resources

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	AR.9-12.F.TFM.5.2 (F.5.TFM.2) Apply properties of logarithms to convert and solve logarithmic (common and natural) and exponential equations	Algebra 2: SE/TE: 462-467, 469-475, 478-481, 489
CC.9-12.F.LE.5 Construct and compare linear, quadratic, and exponential models and solve problems. Interpret the parameters in a linear or exponential function in terms of a context.*	AR.9-12.RF.AII.1.4 (RF.1.AII.4) Analyze and report, with and without appropriate technology, the effect of changing coefficients, exponents, and other parameters on functions and their graphs (linear, quadratic, and higher degree polynomial)	Algebra 1: SE/TE: 242, 246-247, 308-313, 546-551, 553-558, 675 Algebra 2: SE/TE: 99-100, 194-198, 339-341
(Continued) CC.9-12.F.LE.5 Construct and compare linear, quadratic, and exponential models and solve problems. Interpret the parameters in a linear or exponential function in terms of a context.*	AR.9-12.QEF.AII.3.5 (QEF.3.AII.5) Develop and analyze, with and without appropriate technology, quadratic relations: -- graph a parabolic relationship when given its equation -- write an equation when given its roots (zeros or solutions) or graph -- determine the nature of the solutions graphically and by evaluating the discriminant -- determine the maximum or minimum values and the axis of symmetry both graphically and algebraically	Algebra 1: SE/TE: 546-552, 553-558, 561-562, 582-588 Algebra 2: SE/TE: 194-201, 203-204, 209-211, 232, 242-243, 268
	AR.9-12.ELF.AII.5.4 (ELF.5.AII.4) Recognize and solve problems that can be modeled using exponential functions	Algebra 1: SE/TE: 455, 461-465, 591 Algebra 2: SE/TE: 436-440, 471, 474-476 TE: 441A Lesson Resources

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<p>(Continued) CC.9-12.F.LE.5 Construct and compare linear, quadratic, and exponential models and solve problems. Interpret the parameters in a linear or exponential function in terms of a context.*</p>	<p>AR.9-12.LF.AI.3.5 (LF.3.AI.5) Interpret the rate of change/slope and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300</p> <p>Geometry: SE/TE: 189-195</p> <p>Algebra 2: SE/TE: 70, 501-502, 504</p>
	<p>AR.9-12.LF.AI.3.9 (LF.3.AI.9) Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa</p>	<p>Algebra 1: SE/TE: 294-300</p> <p>Geometry: SE/TE: 189-195 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 77-80, 81-88 TE: 88A, 80A Lesson Resources</p>
	<p>AR.9-12.LF.AC.2.4 (LF.2.AC.4) Interpret the rate of change (slope) and intercepts within the context of everyday life</p>	<p>Algebra 1: SE/TE: 294-300</p> <p>Geometry: SE/TE: 189-196 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 447, 437, 500-504</p>
	<p>AR.9-12.EF.TDM.4.4 (EF.4.TDM.4) Recognize and apply properties of exponential functions to solve real-world problems (e.g., compound interest, amortization, annuities, appreciation, depreciation)</p>	<p>Algebra 1: SE/TE: 675, 478, 461, 462</p> <p>Algebra 2: SE/TE: 436-437, 447-449</p>
<p>CC.9-12.F.TF.1 Extend the domain of trigonometric functions using the unit circle. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.</p>	<p>AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle</p>	<p>Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources</p> <p>Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources</p> <p>Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926</p>

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	AR.9-12.TF.PCT.5.3 (TF.5.PCT.3) Sketch an angle in standard position and determine the reference angle and coterminal angles	Algebra 2: SE/TE: 836-838
	AR.9-12.TF.PCT.5.2 (TF.5.PCT.2) Use degrees and radians interchangeably to represent angle measure	Algebra 2: SE/TE: 844-848
CC.9-12.F.TF.2 Extend the domain of trigonometric functions using the unit circle. 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.	AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle	Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926
	AR.9-12.TF.PCT.5.3 (TF.5.PCT.3) Sketch an angle in standard position and determine the reference angle and coterminal angles	Algebra 2: SE/TE: 844-848
CC.9-12.F.TF.3 (+) Extend the domain of trigonometric functions using the unit circle. Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number.	AR.9-12.PC.PCT.8.1 (PC.8.PCT.1) Convert polar coordinates to rectangular coordinates and rectangular coordinates to polar coordinates	Studied in 4th year course
	AR.9-12.PC.PCT.8.2 (PC.8.PCT.2) Represent equations given in rectangular coordinates in terms of polar coordinates	Studied in 4th year course
	AR.9-12.PC.PCT.8.3 (PC.8.PCT.3) Graph polar equations and use appropriate technology when needed	Studied in 4th year course

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<p>(Continued) CC.9-12.F.TF.3 (+) Extend the domain of trigonometric functions using the unit circle. Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number.</p>	<p>AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle</p>	<p>Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources</p> <p>Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources</p> <p>Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926</p>
	<p>AR.9-12.TF.PCT.5.4 (TF.5.PCT.4) Find the values of the trigonometric functions given the value of one trigonometric function and an additional piece of qualifying information or given the coordinates of a point on the terminal side of an angle</p>	<p>Algebra 2: SE/TE: 919-926 TE: 926A Lesson Resources</p>
	<p>AR.9-12.TF.PCT.5.5 (TF.5.PCT.5) Develop and become fluent in the recall of the exact values of the trigonometric functions for special angles</p>	<p>Algebra 2: SE/TE: 838-839</p>
	<p>AR.9-12.TF.PCT.5.7 (TF.5.PCT.7) Graph the six trigonometric functions, identify domain, range, intercepts, period, amplitude, and asymptotes as applicable and use symmetry to determine whether the function is even or odd through appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 851-858, 861-867, 868-874, 883, 886 TE: 858A, 867A, 874A Lesson Resources</p>

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CC.9-12.F.TF.4 (+) Extend the domain of trigonometric functions using the unit circle. Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	AR.9-12.PC.PCT.8.1 (PC.8.PCT.1) Convert polar coordinates to rectangular coordinates and rectangular coordinates to polar coordinates	Studied in 4th year course
	AR.9-12.PC.PCT.8.2 (PC.8.PCT.2) Represent equations given in rectangular coordinates in terms of polar coordinates	Studied in 4th year course
(Continued) CC.9-12.F.TF.4 (+) Extend the domain of trigonometric functions using the unit circle. Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	AR.9-12.PC.PCT.8.3 (PC.8.PCT.3) Graph polar equations and use appropriate technology when needed	Studied in 4th year course
	AR.9-12.TF.PCT.5.7 (TF.5.PCT.7) Graph the six trigonometric functions, identify domain, range, intercepts, period, amplitude, and asymptotes as applicable and use symmetry to determine whether the function is even or odd through appropriate technology when needed	Algebra 2: SE/TE: 851-858, 861-867, 868-874, 883, 886 TE: 858A, 867A, 874A Lesson Resources
CC.9-12.F.TF.5 Model periodic phenomena with trigonometric functions. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.*	AR.9-12.TF.AIII.5.4 (TF.5.AIII.4) Solve, with and without appropriate technology, real world problems involving applications of: -- trigonometric functions, -- law of Sines, -- law of Cosines, -- area of oblique triangles	Algebra 2: SE/TE: 928-934, 936-942
	AR.9-12.TF.PCT.5.2 (TF.5.PCT.2) Use degrees and radians interchangeably to represent angle measure	Algebra 2: SE/TE: 844-848

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<p>CC.9-12.F.TF.6 (+) Model periodic phenomena with trigonometric functions. Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.</p> <p>(Continued) CC.9-12.F.TF.6 (+) Model periodic phenomena with trigonometric functions. Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.</p>	<p>AR.9-12.TF.PCT.5.8 (TF.5.PCT.8) Determine, with and without appropriate technology, the amplitude, period, phase shift, and vertical shift, and sketch the graph of transformations of the trigonometric functions</p>	<p>Algebra 2: SE/TE: 875-882 TE: 882A Lesson Resources</p>
	<p>AR.9-12.TF.PCT.5.9 (TF.5.PCT.9) Identify and graph, with and without appropriate technology, the inverse of trigonometric functions including the restrictions on the domain</p>	<p>Algebra 2: SE/TE: 911-917 TE: 918A Lesson Resources</p>
<p>CC.9-12.F.TF.7 (+) Model periodic phenomena with trigonometric functions. Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.*</p>	<p>AR.9-12.TF.PCT.5.8 (TF.5.PCT.8) Determine, with and without appropriate technology, the amplitude, period, phase shift, and vertical shift, and sketch the graph of transformations of the trigonometric functions</p>	<p>Algebra 2: SE/TE: 875-882 TE: 882A Lesson Resources</p>
	<p>AR.9-12.TF.PCT.5.9 (TF.5.PCT.9) Identify and graph, with and without appropriate technology, the inverse of trigonometric functions including the restrictions on the domain</p>	<p>Algebra 2: SE/TE: 911-917 TE: 918A Lesson Resources</p>
	<p>AR.9-12.TEI.PCT.7.3 (TEI.7.PCT.3) Solve trigonometric equations algebraically and graphically and use appropriate technology when needed</p>	<p>Algebra 2: SE/TE: 911-918 TE: 918A Lesson Resources</p>

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<p>CC.9-12.F.TF.8 Prove and apply trigonometric identities. Prove the Pythagorean identity $(\sin A)^2 + (\cos A)^2 = 1$ and use it to find $\sin A$, $\cos A$, or $\tan A$, given $\sin A$, $\cos A$, or $\tan A$, and the quadrant of the angle.</p>	<p>AR.9-12.TEI.PCT.7.1 (TEI.7.PCT.1) Develop the Pythagorean Identities and use to verify other identities and simplify expressions</p>	<p>Algebra 2: SE/TE: 906-909 TE: 910A Lesson Resources</p>
<p>CC.9-12.F.TF.9 (+) Prove and apply trigonometric identities. Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.</p>	<p>AR.9-12.TEI.PCT.7.2 (TEI.7.PCT.2) Develop and use trigonometric formulas including sum and difference formulas and multiple-angle formulas</p>	<p>Algebra 2: SE/TE: 944-950 TE: 950A Lesson Resources</p>
Geometry		
<p>CC.9-12.G.CO.1 Experiment with transformations in the plane. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.</p>	<p>AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90°, 180°, clockwise and counterclockwise about the origin), -- dilations (scale factor)</p>	<p>Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources</p>
	<p>AR.9-12.LG.G.1.2 (LG.1.G.2) Represent points, lines, and planes pictorially with proper identification, as well as basic concepts derived from these undefined terms, such as segments, rays, and angles</p>	<p>Geometry: SE/TE: 11-19 TE: 19A Lesson Resources</p>

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	AR.9-12.LG.G.1.5 (LG.1.G.5) Explore, with and without appropriate technology, the relationship between angles formed by two lines cut by a transversal to justify when lines are parallel	Geometry: SE/TE: 140-146, 148-155, 156-163, 164-169
CC.9-12.G.CO.2 Experiment with transformations in the plane. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90° , 180° , clockwise and counterclockwise about the origin), -- dilations (scale factor)	Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources
CC.9-12.G.CO.3 Experiment with transformations in the plane. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90° , 180° , clockwise and counterclockwise about the origin), -- dilations (scale factor)	Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A

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	AR.9-12.R.G.4.3 (R.4.G.3) Identify and explain why figures tessellate	Geometry: SE/TE: 595-956
CC.9-12.G.CO.4 Experiment with transformations in the plane. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90° , 180° , clockwise and counterclockwise about the origin), -- dilations (scale factor)	Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources
CC.9-12.G.CO.5 Experiment with transformations in the plane. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90° , 180° , clockwise and counterclockwise about the origin), -- dilations (scale factor)	Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources

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	<p>AR.6.G.8.2 (G.8.6.2) Characteristics of Geometric Shapes: Investigate with manipulatives or grid paper what happens to the perimeter and area of a two-dimensional shape when the dimensions are changed</p>	<p>Geometry: SE/TE: 59-67</p>
<p>CC.9-12.G.CO.6 Understand congruence in terms of rigid motions. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.</p>	<p>AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90°, 180°, clockwise and counterclockwise about the origin), -- dilations (scale factor)</p>	<p>Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources</p>
<p>CC.9-12.G.CO.7 Understand congruence in terms of rigid motions. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.</p>	<p>AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification</p>	<p>Geometry: SE/TE: 440-447, 450-458 TE: 447A, 458A Lesson Resources</p>

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	<p>AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90°, 180°, clockwise and counterclockwise about the origin), -- dilations (scale factor)</p>	<p>Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources</p>
<p>CC.9-12.G.CO.8 Understand congruence in terms of rigid motions. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.</p>	<p>AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification</p>	<p>Geometry: SE/TE: 440-447, 450-458</p>
	<p>AR.9-12.LG.G.1.3 (LG.1.G.3) Describe relationships derived from geometric figures or figural patterns</p>	<p>Geometry: SE/TE: 82-84</p>

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<p>CC.9-12.G.CO.9 Prove geometric theorems. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</p> <p>(Continued) CC.9-12.G.CO.9 Prove geometric theorems. Prove theorems about lines and angles. Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.</p>	<p>AR.9-12.LG.G.1.5 (LG.1.G.5) Explore, with and without appropriate technology, the relationship between angles formed by two lines cut by a transversal to justify when lines are parallel</p>	<p>Geometry: SE/TE: 140-146, 148-155, 156-163, 164-169 TE: 146A, 155A, 163A, 169A Lesson Resources</p>
	<p>AR.9-12.LG.G.1.4 (LG.1.G.4) Apply, with and without appropriate technology, definitions, theorems, properties, and postulates related to such topics as complementary, supplementary, vertical angles, linear pairs, and angles formed by perpendicular lines</p>	<p>Geometry: SE/TE: 34-40, 120-127 TE: 40A, 127A Lesson Resources</p>
	<p>AR.9-12.T.G.2.3 (T.2.G.3) Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems</p>	<p>Geometry: SE/TE: 300-306, 308-314, 292-298, 285-290 TE: 291A, 299A, 307A, 315A Lesson Resources</p>
	<p>AR.9-12.M.G.3.5 (M.3.G.5) Identify and apply properties of and theorems about parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions</p>	<p>Geometry: SE/TE: 164-169 TE: 169A Lesson Resources</p>
	<p>AR.9-12.LG.G.1.3 (LG.1.G.3) Describe relationships derived from geometric figures or figural patterns</p>	<p>Geometry: SE/TE: 82-84, 232</p>

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<p>CC.9-12.G.CO.10 Prove geometric theorems. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</p>	<p>AR.9-12.LG.G.1.6 (LG.1.G.6) Give justification for conclusions reached by deductive reasoning. State and prove key basic theorems in geometry (i.e., the Pythagorean theorem, the sum of the measures of the angles of a triangle is 180°, and the line joining the midpoints of two sides of a triangle is parallel to the third side and half its length)</p>	<p>Geometry: SE/TE: 106-112, 491-494 TE: 112A Lesson Resources</p>
	<p>AR.9-12.T.G.2.3 (T.2.G.3) Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems</p>	<p>Geometry: SE/TE: 285-290, 292-298, 300-306, 308-314 TE: 291A, 299A, 307A, 315A Lesson Resources</p>
	<p>AR.9-12.LG.G.1.3 (LG.1.G.3) Describe relationships derived from geometric figures or figural patterns</p>	<p>Geometry: SE/TE: 82-84, 232</p>
<p>(Continued) CC.9-12.G.CO.10 Prove geometric theorems. Prove theorems about triangles. Theorems include: measures of interior angles of a triangle sum to 180 degrees; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.</p>	<p>AR.9-12.R.G.4.2 (R.4.G.2) Solve problems using properties of polygons: -- sum of the measures of the interior angles of a polygon, -- interior and exterior angle measure of a regular polygon or irregular polygon, -- number of sides or angles of a polygon</p>	<p>Geometry: SE/TE: 353-358 TE: 358A Lesson Resources</p>
	<p>AR.9-12.R.G.4.4 (R.4.G.4) Identify the attributes of the five Platonic Solids</p>	<p>Geometry: SE/TE: 694</p>

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<p>CC.9-12.G.CO.11 Prove geometric theorems. Prove theorems about parallelograms. Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.</p>	<p>AR.9-12.CGT.G.5.5 (CGT.5.G.5) Determine, given a set of points, the type of figure based on its properties (parallelogram, isosceles triangle, trapezoid)</p>	<p>Geometry: SE/TE: 250-256, 359-366, 389-397 TE: 366A, 397A, 256A Lesson Resources</p>
	<p>AR.9-12.M.G.3.5 (M.3.G.5) Identify and apply properties of and theorems about parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions</p>	<p>Geometry: SE/TE: 164-169 TE: 169A Lesson Resources</p>
	<p>AR.9-12.LG.G.1.3 (LG.1.G.3) Describe relationships derived from geometric figures or figural patterns</p>	<p>Geometry: SE/TE: 82-84, 232</p>
	<p>AR.9-12.R.G.4.1 (R.4.G.1) Explore and verify the properties of quadrilaterals</p>	<p>Geometry: SE/TE: 367-371, 421</p>
<p>CC.9-12.G.CO.12 Make geometric constructions. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.</p>	<p>AR.9-12.M.G.3.5 (M.3.G.5) Identify and apply properties of and theorems about parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions</p>	<p>Geometry: SE/TE: 164-169 TE: 169A Lesson Resources</p>

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<p>CC.9-12.G.CO.13 Make geometric constructions. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.</p>	<p>AR.9-12.M.G.3.5 (M.3.G.5) Identify and apply properties of and theorems about parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions</p>	<p>Geometry: SE/TE: 164-169 TE: 169A-B Lesson Resources</p>
<p>CC.9-12.G.SRT.1 Understand similarity in terms of similarity transformations. Verify experimentally the properties of dilations given by a center and a scale factor:</p> <ul style="list-style-type: none"> -- a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged. -- b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor. 	<p>AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification</p>	<p>Geometry: SE/TE: 440-447, 450-458 TE: 447A, 458A Lesson Resources</p>
	<p>AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane:</p> <ul style="list-style-type: none"> -- translations, -- reflections, -- rotations (90°, 180°, clockwise and counterclockwise about the origin), -- dilations (scale factor) 	<p>Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources</p>

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	AR.9-12.M.G.3.4 (M.3.G.4) Use (given similar geometric objects) proportional reasoning to solve practical problems (including scale drawings)	Geometry: SE/TE: 432, 443, 445, 454, 456, 464, 465, 473, 476 TE: 438A Lesson Resources
CC.9-12.G.SRT.2 Understand similarity in terms of similarity transformations. Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.	AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification	Geometry: SE/TE: 440-447, 450-458 TE: 447A, 458A
	AR.9-12.CGT.G.5.7 (CGT.5.G.7) Draw and interpret the results of transformations and successive transformations on figures in the coordinate plane: -- translations, -- reflections, -- rotations (90° , 180° , clockwise and counterclockwise about the origin), -- dilations (scale factor)	Geometry: SE/TE: 545-552, 554-560, 587-593 TE: 552A, 560A, 593A Lesson Resources

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	AR.9-12.M.G.3.4 (M.3.G.4) Use (given similar geometric objects) proportional reasoning to solve practical problems (including scale drawings)	Geometry: SE/TE: 432, 443, 445, 454, 456, 464, 465, 473, 476 TE: 438A Lesson Resources
CC.9-12.G.SRT.3 Understand similarity in terms of similarity transformations. Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.	AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification	Geometry: SE/TE: 440-447, 450-458 TE: 447A, 458A Lesson Resources
CC.9-12.G.SRT.4 Prove theorems involving similarity. Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.	AR.9-12.T.G.2.3 (T.2.G.3) Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems	Geometry: SE/TE: 308-314, 300-306, 292-298, 285-290 TE: 315A, 307A, 299A, 291A Lesson Resources
	AR.9-12.LG.G.1.6 (LG.1.G.6) Give justification for conclusions reached by deductive reasoning. State and prove key basic theorems in geometry (i.e., the Pythagorean theorem, the sum of the measures of the angles of a triangle is 180°, and the line joining the midpoints of two sides of a triangle is parallel to the third side and half its length)	Geometry: SE/TE: 106-112, 491-494 TE: 112A Lesson Resources

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	<p>AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification</p>	<p>Geometry: SE/TE: 440-447, 450-458 TE: 447A, 458A Lesson Resources</p>
<p>CC.9-12.G.SRT.5 Prove theorems involving similarity. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.</p>	<p>AR.9-12.T.G.2.3 (T.2.G.3) Identify and use the special segments of triangles (altitude, median, angle bisector, perpendicular bisector, and midsegment) to solve problems</p>	<p>Geometry: SE/TE: 308-314, 300-306, 292-298, 285-290 TE: 315A, 307A, 299A, 291A Lesson Resources</p>
	<p>AR.9-12.LG.G.1.6 (LG.1.G.6) Give justification for conclusions reached by deductive reasoning. State and prove key basic theorems in geometry (i.e., the Pythagorean theorem, the sum of the measures of the angles of a triangle is 180°, and the line joining the midpoints of two sides of a triangle is parallel to the third side and half its length)</p>	<p>Geometry: SE/TE: 106-112, 491-494 TE: 112A Lesson Resources</p>

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	AR.9-12.T.G.2.1 (T.2.G.1) Apply congruence (SSS ...) and similarity (AA ...) correspondences and properties of figures to find missing parts of geometric figures and provide logical justification	Geometry: SE/TE: 440-447, 450-458
	AR.9-12.TF.PCT.5.6 (TF.5.PCT.6) Solve, with and without appropriate technology, real world problems involving applications of trigonometric functions	Algebra 2: SE/TE: 857, 863, 864, 866, 871, 873, 879, 887, 889, 915, 917
CC.9-12.G.SRT.6 Define trigonometric ratios and solve problems involving right triangles. Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.	AR.9-12.T.G.2.6 (T.2.G.6) Use trigonometric ratios (sine, cosine, tangent) to determine lengths of sides and measures of angles in right triangles including angles of elevation and angles of depression	Algebra 1: 648 Geometry: SE/TE: 507-513, 516-521 TE: 513A, 521A Algebra 2: SE/TE: 921, 923, 924, 925
	AR.9-12.ME.TDM.3.2 (ME.3.TDM.2) Use sine, cosine, and tangent ratios to determine lengths of sides and angle measures of right triangles for real-world problems (e.g., angles of elevation and depression and various distances)	Algebra 1: 648 Geometry: SE/TE: 516-521 TE: 521A Lesson Resources Algebra 2: SE/TE: 921, 923, 924, 925

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	<p>AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle</p>	<p>Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources</p> <p>Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources</p> <p>Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926</p>
	<p>AR.9-12.TF.AIII.5.1 (TF.5.AIII.1) Define sine, cosine, and tangent as ratios of sides of right triangle</p>	<p>Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources</p> <p>Geometry: SE/TE: 507-513 TE: 513A Lesson Resources</p> <p>Algebra 2: SE/TE: 919-926 TE: 926A Lesson Resources</p>
<p>CC.9-12.G.SRT.7 Define trigonometric ratios and solve problems involving right triangles. Explain and use the relationship between the sine and cosine of complementary angles.</p>	<p>AR.9-12.T.G.2.7 (T.2.G.7) Use similarity of right triangles to express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given lengths of sides</p>	<p>Geometry: SE/TE: 507-513</p>
	<p>AR.9-12.ME.TDM.3.2 (ME.3.TDM.2) Use sine, cosine, and tangent ratios to determine lengths of sides and angle measures of right triangles for real-world problems (e.g., angles of elevation and depression and various distances)</p>	<p>Algebra 1: 648</p> <p>Geometry: SE/TE: 516-521 TE: 521A Lesson Resources</p> <p>Algebra 2: SE/TE: 921, 923, 924, 925</p>

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	<p>AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle</p>	<p>Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources</p> <p>Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources</p> <p>Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926</p>
<p>CC.9-12.G.SRT.8 Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.</p>	<p>AR.9-12.T.G.2.4 (T.2.G.4) Apply the Pythagorean Theorem and its converse in solving practical problems</p>	<p>Algebra 1: SE/TE: 614-618</p> <p>Geometry: SE/TE: 491-498 TE: 498A Lesson Resources</p>
	<p>AR.9-12.T.G.2.5 (T.2.G.5) Use the special right triangle relationships (30°-60°-90° and 45°-45°-90°) to solve problems</p>	<p>Geometry: SE/TE: 499-503 Algebra 2: TE: 835</p>

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	AR.9-12.T.G.2.6 (T.2.G.6) Use trigonometric ratios (sine, cosine, tangent) to determine lengths of sides and measures of angles in right triangles including angles of elevation and angles of depression	Algebra 1: SE/TE: 648 Geometry: SE/TE: 516-521 TE: 521A Lesson Resources Algebra 2: SE/TE: 921, 923, 924, 925
	AR.9-12.T.G.2.7 (T.2.G.7) Use similarity of right triangles to express the sine, cosine, and tangent of an angle in a right triangle as a ratio of given lengths of sides	Geometry: SE/TE: 507-513
	AR.9-12.SEI.AI.2.7 (SEI.2.AI.7) Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and Pythagorean Theorem)	Algebra 1: SE/TE: 614-618 Geometry: SE/TE: 50-56, 61 TE: 56A Lesson Resources
	AR.9-12.SEI.AC.3.4 (SEI.3.AC.4) Use, with and without appropriate technology, coordinate geometry to represent and solve problems including midpoint, length of a line segment and Pythagorean Theorem	Algebra 1: SE/TE: 614-618 Geometry: SE/TE: 50-56, 61 TE: 56A Lesson Resources
(Continued) CC.9-12.G.SRT.8 Define trigonometric ratios and solve problems involving right triangles. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	AR.9-12.ME.TDM.3.2 (ME.3.TDM.2) Use sine, cosine, and tangent ratios to determine lengths of sides and angle measures of right triangles for real-world problems (e.g., angles of elevation and depression and various distances)	Algebra 1: 648 Geometry: SE/TE: 516-521 TE: 521A Lesson Resources Algebra 2: SE/TE: 921, 923, 924, 925

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	<p>AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle</p>	<p>Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources</p> <p>Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources</p> <p>Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926</p>
<p>CC.9-12.G.SRT.9 (+) Apply trigonometry to general triangles. Derive the formula $A = (1/2)ab \sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex</p>	<p>AR.9-12.PC.PCT.8.4 (PC.8.PCT.4) Apply polar coordinates to real world situations and use appropriate technology when needed</p>	<p>Studied in a 4th year course.</p>

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perpendicular to the opposite side.	AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle	Algebra 1: SE/TE: 645-651 TE: 651A Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926
	AR.9-12.OT.PCT.6.3 (OT.6.PCT.3) Determine the area of an oblique triangle by using an appropriate formula and appropriate technology when needed	Geometry: SE/TE: 617-620 Algebra 2: SE/TE: 928-929
	AR.9-12.TF.AIII.5.3 (TF.5.AIII.3) Determine (by using an appropriate formula), with and without technology, the area of an oblique triangle	Geometry: SE/TE: 617-620 Algebra 2: SE/TE: 928-929
CC.9-12.G.SRT.10 (+) Apply trigonometry to general triangles. Prove the Laws of Sines and Cosines and use them to solve problems.	AR.9-12.ME.TDM.3.3 (ME.3.TDM.3) Use laws of sine and cosine to determine lengths of sides, measures of angles, and area of triangles for real- world problems (e.g., Heron's formula)	Algebra 2: SE/TE: 928-934, 936-942 TE: 934A, 942A Lesson Resources

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	AR.9-12.PC.PCT.8.4 (PC.8.PCT.4) Apply polar coordinates to real world situations and use appropriate technology when needed	Studied in 4th year course
	AR.9-12.TF.PCT.5.1 (TF.5.PCT.1) Define the six trigonometric functions as: -- circular functions, -- ratios of sides of right triangles, -- functions of an angle in standard position when given a point on the terminal side of the angle	Algebra 1: SE/TE: 645-651 TE: 651A Lesson Resources Geometry: SE/TE: 506-513 TE: 489B, 513A Lesson Resources Algebra 2: SE/TE: 838-842, 851-855, 861-864, 868-872, 919-926
	AR.9-12.OT.PCT.6.1 (OT.6.PCT.1) Develop and use the Law of Sines and the Law of Cosines to solve oblique triangles and use appropriate technology when needed	Algebra 2: SE/TE: 928-934, 936-942 TE: 934A, 942A
	AR.9-12.OT.PCT.6.2 (OT.6.PCT.2) Solve real world problems applying the Law of Sines and the Law of Cosines and appropriate technology when needed	Algebra 2: SE/TE: 931, 933, 934, 941-942
	AR.9-12.TF.AIII.5.2 (TF.5.AIII.2) Develop and use, with and without appropriate technology, the Law of Sines and the Law of Cosines to solve oblique triangles	Algebra 2: SE/TE: 928-934, 936-942 TE: 934A, 942A Lesson Resources
CC.9-12.G.SRT.11 (+) Apply trigonometry to general triangles. Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems,	AR.9-12.ME.TDM.3.3 (ME.3.TDM.3) Use laws of sine and cosine to determine lengths of sides, measures of angles, and area of triangles for real- world problems (e.g., Heron's formula)	Algebra 2: SE/TE: 928-934, 936-942 TE: 934A, 942A Lesson Resources

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resultant forces).	AR.9-12.PC.PCT.8.4 (PC.8.PCT.4) Apply polar coordinates to real world situations and use appropriate technology when needed	Studied in 4th year course
	AR.9-12.OT.PCT.6.1 (OT.6.PCT.1) Develop and use the Law of Sines and the Law of Cosines to solve oblique triangles and use appropriate technology when needed	Algebra 2: SE/TE: 928-934, 936-942 TE: 934A, 942A
	AR.9-12.OT.PCT.6.2 (OT.6.PCT.2) Solve real world problems applying the Law of Sines and the Law of Cosines and appropriate technology when needed	Algebra 2: SE/TE: 931, 933, 934, 941-942
	AR.9-12.TF.PCT.5.6 (TF.5.PCT.6) Solve, with and without appropriate technology, real world problems involving applications of trigonometric functions	Algebra 2: SE/TE: 857, 863, 864, 866, 871, 873, 879, 887, 889, 915, 917
	AR.9-12.TF.AIII.5.2 (TF.5.AIII.2) Develop and use, with and without appropriate technology, the Law of Sines and the Law of Cosines to solve oblique triangles	Algebra 2: SE/TE: 928-934, 936-942 TE: 934A, 942A Lesson Resources
CC.9-12.G.C.1 Understand and apply theorems about circles. Prove that all circles are similar.	AR.9-12.R.G.4.5 (R.4.G.5) Investigate and use the properties of angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles	Geometry: SE/TE: 790-797 TE: 797A Lesson Resources
	AR.9-12.CGT.G.5.6 (CGT.5.G.6) Write, in standard form, the equation of a circle given a graph on a coordinate plane or the center and radius of a circle	Geometry: SE/TE: 798-803 TE: 803A Lesson Resources Algebra 2: SE/TE: 630-636 TE: 636A Lesson Resources

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<p>CC.9-12.G.C.2 Understand and apply theorems about circles. Identify and describe relationships among inscribed angles, radii, and chords. Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.</p>	<p>AR.9-12.R.G.4.5 (R.4.G.5) Investigate and use the properties of angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles</p>	<p>Geometry: SE/TE: 790-797 TE: 797A</p>
	<p>AR.9-12.LF.AI.3.9 (LF.3.AI.9) Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa</p>	<p>Algebra 1: SE/TE: 308-312</p> <p>Geometry: SE/TE: 189-195 TE: 196A Lesson Resources</p> <p>Algebra 2: SE/TE: 77-80, 81-88 TE: 88A, 80A Lesson Resources</p>
	<p>AR.9-12.LF.AI.3.7 (LF.3.AI.7) Determine by using slope whether a pair of lines are parallel, perpendicular, or neither</p>	<p>Algebra 1: SE/TE: 330-331</p> <p>Geometry: SE/TE: 197-204 TE: 204A</p> <p>Algebra 2: SE/TE: 85</p>
	<p>AR.9-12.R.G.4.6 (R.4.G.6) Solve problems using inscribed and circumscribed figures</p>	<p>Geometry: SE/TE: 301, 303, 667, 766</p>
<p>CC.9-12.G.C.3 Understand and apply theorems about circles. Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.</p>	<p>AR.9-12.R.G.4.5 (R.4.G.5) Investigate and use the properties of angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles</p>	<p>Geometry: SE/TE: 790-797 TE: 797A Lesson Resources</p>
	<p>AR.9-12.R.G.4.6 (R.4.G.6) Solve problems using inscribed and circumscribed figures</p>	<p>Geometry: SE/TE: 301, 303, 667, 766</p>
<p>CC.9-12.G.C.4 (+) Understand and apply theorems about circles. Construct a tangent line from a point outside a given circle to the circle.</p>	<p>AR.9-12.R.G.4.5 (R.4.G.5) Investigate and use the properties of angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles</p>	<p>Geometry: SE/TE: 790-797 TE: 797A Lesson Resources</p>

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<p>CC.9-12.G.C.5 Find arc lengths and areas of sectors of circles. Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.</p>	<p>AR.9-12.R.G.4.5 (R.4.G.5) Investigate and use the properties of angles (central and inscribed) arcs, chords, tangents, and secants to solve problems involving circles</p>	<p>Geometry: SE/TE: 790-797 TE: 797A Lesson Resources</p>
<p>CC.9-12.G.GPE.1 Translate between the geometric description and the equation for a conic section. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.</p>	<p>AR.9-12.CGT.G.5.6 (CGT.5.G.6) Write, in standard form, the equation of a circle given a graph on a coordinate plane or the center and radius of a circle</p>	<p>Geometry: SE/TE: 798-803 TE: 803A Lesson Resources</p> <p>Algebra 2: SE/TE: 630-636 TE: 636A Lesson Resources</p>
	<p>AR.9-12.C.PCT.3.1 (C.3.PCT.1) Identify, graph, write, and analyze equations of conic sections, using properties such as symmetry, intercepts, foci, asymptotes, and eccentricity, and when appropriate, use technology</p>	<p>Algebra 2: SE/TE: 614-620, 622-629, 630-636, 638-644, 645-652, 653-660 TE: 620A, 621, 629A, 636A, 644A, 652A, 660A</p>

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<p>CC.9-12.G.GPE.2 Translate between the geometric description and the equation for a conic section. Derive the equation of a parabola given a focus and directrix.</p>	<p>AR.9-12.C.PCT.3.1 (C.3.PCT.1) Identify, graph, write, and analyze equations of conic sections, using properties such as symmetry, intercepts, foci, asymptotes, and eccentricity, and when appropriate, use technology</p>	<p>Algebra 2: SE/TE: 614-620, 622-629, 630-636, 638-644, 645-652, 653-660 TE: 620A, 621, 629A, 636A, 644A, 652A, 660A Lesson Resources</p>
<p>CC.9-12.G.GPE.3 (+) Translate between the geometric description and the equation for a conic section. Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.</p>	<p>AR.9-12.C.PCT.3.1 (C.3.PCT.1) Identify, graph, write, and analyze equations of conic sections, using properties such as symmetry, intercepts, foci, asymptotes, and eccentricity, and when appropriate, use technology</p>	<p>Algebra 2: SE/TE: 614-620, 622-629, 630-636, 638-644, 645-652, 653-660 TE: 620A, 621, 629A, 636A, 644A, 652A, 660A</p>
<p>CC.9-12.G.GPE.4 Use coordinates to prove simple geometric theorems algebraically. For example, prove or disprove that a figure defined by four given points in the coordinate plane is a rectangle; prove or disprove that the point $(1, \sqrt{3})$ lies on the circle centered at the origin and containing the point $(0, 2)$.</p>	<p>AR.9-12.CGT.G.5.1 (CGT.5.G.1) Use coordinate geometry to find the distance between two points, the midpoint of a segment, and the slopes of parallel, perpendicular, horizontal, and vertical lines</p>	<p>Geometry: SE/TE: 400-405, 406-412, 418 TE: 405A, 412A Lesson Resources</p>
	<p>AR.9-12.CGT.G.5.5 (CGT.5.G.5) Determine, given a set of points, the type of figure based on its properties (parallelogram, isosceles triangle, trapezoid)</p>	<p>Geometry: SE/TE: 250-256, 359-366, 389-397 TE: 366A, 397A, 256A Lesson Resources</p>
<p>CC.9-12.G.GPE.5 Use coordinates to prove simple geometric theorems algebraically. Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the</p>	<p>AR.9-12.M.G.3.5 (M.3.G.5) Identify and apply properties of and theorems about parallel and perpendicular lines to prove other theorems and perform basic Euclidean constructions</p>	<p>Geometry: SE/TE: 164-169 TE: 169A Lesson Resources</p>

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equation of a line parallel or perpendicular to a given line that passes through a given point).	AR.9-12.LF.AI.3.7 (LF.3.AI.7) Determine by using slope whether a pair of lines are parallel, perpendicular, or neither	Algebra 1: SE/TE: 330-331 Geometry: SE/TE: 197-204 TE: 204A Lesson Resources Algebra 2: SE/TE: 85
	AR.9-12.LF.AC.2.6 (LF.2.AC.6) Determine, using slope, whether a pair of lines are parallel, perpendicular, or neither	Algebra 1: SE/TE: 330-331 Geometry: SE/TE: 197-204 TE: 204A Lesson Resources Algebra 2: SE/TE: 85
CC.9-12.G.GPE.6 Use coordinates to prove simple geometric theorems algebraically. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.	AR.9-12.SEI.AI.2.7 (SEI.2.AI.7) Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and Pythagorean Theorem)	Algebra 1: SE/TE: 614-618 Geometry: SE/TE: 50-56, 61 TE: 56A Lesson Resources
	AR.9-12.SEI.AC.3.4 (SEI.3.AC.4) Use, with and without appropriate technology, coordinate geometry to represent and solve problems including midpoint, length of a line segment and Pythagorean Theorem	Algebra 1: SE/TE: 614-618 Geometry: SE/TE: 50-56, 61 TE: 56A Lesson Resources
CC.9-12.G.GPE.7 Use coordinates to prove simple geometric theorems algebraically. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.*	AR.9-12.CGT.G.5.1 (CGT.5.G.1) Use coordinate geometry to find the distance between two points, the midpoint of a segment, and the slopes of parallel, perpendicular, horizontal, and vertical lines	Geometry: SE/TE: 400-405, 406-412 TE: 405A, 412A Lesson Resources

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	AR.9-12.M.G.3.3 (M.3.G.3) Relate changes in the measurement of one attribute of an object to changes in other attributes	Geometry: SE/TE: 310-315
	AR.9-12.SEI.AI.2.7 (SEI.2.AI.7) Use coordinate geometry to represent and/or solve problems (midpoint, length of a line segment, and Pythagorean Theorem)	Geometry: SE/TE: 400-405
	AR.9-12.SEI.AC.3.4 (SEI.3.AC.4) Use, with and without appropriate technology, coordinate geometry to represent and solve problems including midpoint, length of a line segment and Pythagorean Theorem	Algebra 1: SE/TE: 614-618 Geometry: SE/TE: 50-56, 61 TE: 56A Lesson Resources
CC.9-12.G.GMD.1 Explain volume formulas and use them to solve problems. Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.	AR.9-12.M.G.3.2 (M.3.G.2) Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms	Geometry: SE/TE: 59-67, 688-695, 699-707, 708-715, 717-724, 726-732, 733-740 TE: 67A, 695A, 707A, 715A, 724A, 732A, 740A Lesson Resources
CC.9-12.G.GMD.2 (+) Explain volume formulas and use them to solve problems. Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.	AR.9-12.M.G.3.2 (M.3.G.2) Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms	Geometry: SE/TE: 59-67, 688-695, 699-707, 708-715, 717-724, 726-732, 733-740 TE: 67A, 695A, 707A, 715A, 724A, 732A, 740A Lesson Resources

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<p>CC.9-12.G.GMD.3 Explain volume formulas and use them to solve problems. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*</p>	<p>AR.9-12.M.G.3.2 (M.3.G.2) Apply, using appropriate units, appropriate formulas (area, perimeter, surface area, volume) to solve application problems involving polygons, prisms, pyramids, cones, cylinders, spheres as well as composite figures, expressing solutions in both exact and approximate forms</p>	<p>Geometry: SE/TE: 59-67, 688-695, 699-707, 708-715, 717-724, 726-732, 733-740 TE: 67A, 695A, 707A, 715A, 724A, 732A, 740A Lesson Resources</p>
	<p>AR.9-12.NF.AC.4.5 (NF.4.AC.5) Identify and apply nonlinear functions to real world situations such as acceleration, area, volume, population, bacteria, compound interest, percent depreciation and appreciation, amortization, geometric sequences, etc.</p>	<p>Algebra 1: SE/TE: 236, 238, 244, 245, 250, 251, 258, 262, 264, 265, 266, 271, 272 Algebra 2: SE/TE: 471, 474-476, 480, 482-483</p>
<p>CC.9-12.G.GMD.4 Visualize relationships between two-dimensional and three-dimensional objects. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.</p>	<p>AR.9-12.R.G.4.8 (R.4.G.8) Draw, examine, and classify cross-sections of three-dimensional objects</p>	<p>Geometry: SE/TE: 688-693 TE: 695A Lesson Resources</p>
<p>CC.9-12.G.MG.1 Apply geometric concepts in modeling situations. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).*</p>	<p>AR.9-12.MM.TM.3.1 (MM.3.TM.1) Establish connections between tables and graphs and the symbolic form using geometric and algebraic models (quadratic, rational, etc.)</p>	<p>Geometry: SE/TE: 464-466 TE: 467B</p>
<p>CC.9-12.G.MG.2 Apply geometric concepts in modeling situations. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).*</p>	<p>AR.9-12.MM.TM.3.1 (MM.3.TM.1) Establish connections between tables and graphs and the symbolic form using geometric and algebraic models (quadratic, rational, etc.)</p>	<p>Geometry: SE/TE: 464-466 TE: 467B</p>

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CC.9-12.G.MG.3 Apply geometric concepts in modeling situations. Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*	AR.9-12.MM.TM.3.1 (MM.3.TM.1) Establish connections between tables and graphs and the symbolic form using geometric and algebraic models (quadratic, rational, etc.)	Geometry: SE/TE: 464-466 TE: 467B
	AR.8.G.11.1 (G.11.8.1) Spatial Visualization and Models: Using isometric dot paper interpret and draw different views of buildings	Geometry: SE/TE: 5-10 TE: 10A Lesson Resources
	AR.7.G.11.2 (G.11.7.2) Spatial Visualization and Models: Construct a building out of cubes from a set of views (front, top, side)	Geometry: SE/TE: 700
Statistics and Probability		
CC.9-12.S.ID.1 Summarize, represent, and interpret data on a single count or measurement variable. Represent data with plots on the real number line (dot plots, histograms, and box plots).*	AR.9-12.DIP.AI.5.5 (DIP.5.AI.5) Use two or more graphs (i.e., box-and-whisker, histograms, scatter plots) to compare data sets	Algebra 1: SE/TE: 746-751 TE: 751A Lesson Resources Algebra 2: SE/TE: 714-718 TE: 718A Lesson Resources
	AR.9-12.DIP.AI.5.6 (DIP.5.AI.6) Construct and interpret a cumulative frequency histogram in real life situations	Algebra 1: SE/TE: 732-737 TE: 737A Algebra 2: TE: 695
	AR.9-12.PS.AC.1.5 (PS.1.AC.5) Interpret and evaluate, with and without appropriate technology, graphical and tabular data displays for: -- consistency with the data, -- appropriateness of type of graph or data display, -- scale, -- overall message	Algebra 1: SE/TE: 732-737, 746-751, 753-759 TE: 737A Lesson Resources Algebra 2: SE/TE: 711-718

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	AR.9-12.DA.TDM.5.1 (DA.5.TDM.1) Read, interpret, and analyze graphical representations of data used in various contexts (e.g., science reasoning, newspaper graphs)	Algebra 1: SE/TE: 738-744 Algebra 2: SE/TE: 711-718, 719-724, 725-730, 739-745
	AR.9-12.DIP.AI.5.10 (DIP.5.AI.10) Communicate real world problems graphically, algebraically, numerically and verbally	Algebra 1: SE/TE: 732-737, 746-751, 753-759 TE: 737A Lesson Resources Algebra 2: SE/TE: 711-718
	AR.9-12.S.TFM.4.2 (S.4.TFM.2) Calculate and interpret statistical problems using measures of central tendencies and graphs: -- histograms, -- normal curve	Algebra 1: SE/TE: 738-744 Algebra 2: SE/TE: 711-718
CC.9-12.S.ID.2 Summarize, represent, and interpret data on a single count or measurement variable. 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.*	AR.9-12.DS.S.5.2 (DS.1.S.2) Compute and use mean, mode, weighted mean, geometric mean, harmonic mean, range, quartiles, variance, and standard deviation	Algebra 1: SE/TE: 738-744, 746-749 TE: 744A Lesson Resources Algebra 2: SE/TE: 711-718, 719-721
	AR.9-12.DAP.AII.6.5 (DAP.6.AII.5) Compute and explain measures of spread (range, percentiles, variance, standard deviation)	Algebra 1: SE/TE: 738-744, 746-749 TE: 744A Lesson Resources Algebra 2: SE/TE: 711-718, 719-721
	AR.9-12.DIP.AI.5.4 (DIP.5.AI.4) Determine the effects of changes in the data set on the measures of central tendency	Algebra 1: SE/TE: 738-744 Algebra 2: SE/TE: 711-718
	AR.9-12.DIP.AI.5.5 (DIP.5.AI.5) Use two or more graphs (i.e., box-and-whisker, histograms, scatter plots) to compare data sets	Algebra 1: SE/TE: 336,746-751 Algebra 2: SE/TE: 93, 714-718

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	AR.9-12.DIP.AI.5.6 (DIP.5.AI.6) Construct and interpret a cumulative frequency histogram in real life situations	Algebra 1: SE/TE: 732-737, TE: 737A Lesson Resources
	AR.9-12.PS.TM.4.2 (PS.4.TM.2) Describe and summarize data numerically using central tendency variation, position statistics, and distributions	Algebra 1: SE/TE: 732-737, 738-744 Algebra 2: SE/TE: 711-718
	AR.9-12.DA.TDM.5.5 (DA.5.TDM.5) Determine and interpret the measures of spread of a data set (e.g., standard deviation, range, percentiles, variance)	Algebra 1: SE/TE: 738-744 Algebra 2: SE/TE: 711-718
CC.9-12.S.ID.2 Summarize, represent, and interpret data on a single count or measurement variable. 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.*	AR.9-12.S.TFM.4.4 (S.4.TFM.4) Investigate and analyze the characteristics of normal and skewed distributions	Algebra 2: SE/TE: 739-744 TE: 745A Lesson Resources
	AR.9-12.S.TFM.4.5 (S.4.TFM.5) Determine and interpret measures of variation of a data set, with or without technology: -- standard deviation, -- range, -- percentiles, -- variance	Algebra 1: SE/TE: 738-744, 746-749 TE: 744A Lesson Resources Algebra 2: SE/TE: 711-718, 719-721
CC.9-12.S.ID.3 Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).*	AR.9-12.DA.S.4.1 (DA.4.S.1) Summarize distributions of univariate data by determining and interpreting measures of center, spread, position, boxplot, and effects of changing units on summary measures.	Algebra 1: SE/TE: 753-758 TE: 759A Lesson Resources
	AR.9-12.DS.S.5.2 (DS.1.S.2) Compute and use mean, mode, weighted mean, geometric mean, harmonic mean, range, quartiles, variance, and standard deviation	Algebra 1: SE/TE: 738-744, 746-749 TE: 744A Lesson Resources Algebra 2: SE/TE: 711-718, 719-721

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	AR.9-12.DAP.AII.6.5 (DAP.6.AII.5) Compute and explain measures of spread (range, percentiles, variance, standard deviation)	Algebra 1: SE/TE: 738-744, 746-749 TE: 744A Lesson Resources Algebra 2: SE/TE: 711-718, 719-721
	AR.9-12.DIP.AI.5.5 (DIP.5.AI.5) Use two or more graphs (i.e., box-and-whisker, histograms, scatter plots) to compare data sets	Algebra 1: SE/TE: 336,746-751 Algebra 2: SE/TE: 93, 714-718 TE: 125
	AR.9-12.DIP.AI.5.6 (DIP.5.AI.6) Construct and interpret a cumulative frequency histogram in real life situations	Algebra 1: SE/TE: 732-737 TE: 737A Lesson Resources
(Continued) CC.9-12.S.ID.3 Summarize, represent, and interpret data on a single count or measurement variable. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).*	AR.9-12.DA.TDM.5.4 (DA.5.TDM.4) Investigate and analyze the characteristics of normal and skewed distributions	Algebra 2: SE/TE: 739-744 TE: 745A Lesson Resources
	AR.9-12.DA.TDM.5.5 (DA.5.TDM.5) Determine and interpret the measures of spread of a data set (e.g., standard deviation, range, percentiles, variance)	Algebra 1: SE/TE: 738-744 Algebra 2: SE/TE: 711-718
	AR.9-12.S.TFM.4.2 (S.4.TFM.2) Calculate and interpret statistical problems using measures of central tendencies and graphs: -- histograms, -- normal curve	Algebra 1: SE/TE: 738-744 Algebra 2: SE/TE: 711-718
	AR.9-12.S.TFM.4.4 (S.4.TFM.4) Investigate and analyze the characteristics of normal and skewed distributions	Algebra 2: SE/TE: 739-744 TE: 745A Lesson Resources
CC.9-12.S.ID.4 Summarize, represent, and interpret data on a single count or measurement variable. Use the mean and standard deviation of a data set to fit it to a	AR.9-12.SI.S.10.1 (SI.10.S.1) Explore the characteristics and applications of the normal distribution and standardized scores	Algebra 2: SE/TE: 739-745 TE: 745A-749 Lesson Resources

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<p>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.*</p> <p>(Continued) CC.9-12.S.ID.4 Summarize, represent, and interpret data on a single count or measurement variable. 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.*</p>	<p>AR.9-12.DAP.AII.6.6 (DAP.6.AII.6) Describe the characteristics of a Gaussian normal distribution</p>	<p>Algebra 2: SE/TE: 739-742</p>
	<p>AR.9-12.DA.TDM.5.4 (DA.5.TDM.4) Investigate and analyze the characteristics of normal and skewed distributions</p>	<p>Algebra 2: SE/TE: 739-744 TE: 745A Lesson Resources</p>
	<p>AR.9-12.DA.TDM.5.5 (DA.5.TDM.5) Determine and interpret the measures of spread of a data set (e.g., standard deviation, range, percentiles, variance)</p>	<p>Algebra 1: SE/TE: 738-744</p> <p>Algebra 2: SE/TE: 711-718</p>
	<p>AR.9-12.S.TFM.4.4 (S.4.TFM.4) Investigate and analyze the characteristics of normal and skewed distributions</p>	<p>Algebra 2: SE/TE: 739-744 TE: 745A Lesson Resources</p>
<p>CC.9-12.S.ID.5 Summarize, represent, and interpret data on two categorical and quantitative variables. 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.*</p>	<p>AR.9-12.PS.AC.1.2 (PS.1.AC.2) Conduct and interpret simple probability experiments using: -- manipulatives (spinners, dice, cards, coins), -- simulations (using random number tables, graphing calculators, or computer software)</p>	<p>Algebra 1: TE: 775,782A Lesson Resources</p> <p>Geometry: SE/TE: 824-829, 830-835 TE: 829A, 835A Lesson Resources</p> <p>Algebra 2: TE: 682, 694, 702, 705</p>
<p>CC.9-12.S.ID.6 Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Algebra 1: SE/TE: 336-343</p> <p>Algebra 2: SE/TE: 92-98</p>

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CC.9-12.S.ID.6a 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.*	AR.9-12.DAP.AII.6.1 (DAP.6.AII.1) Find regression line for scatter plot, using appropriate technology, and interpret the correlation coefficient	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98, TE: 98A Lesson Resources
	AR.9-12.DAP.AII.6.3 (DAP.6.AII.3) Find the quadratic curve of best fit using appropriate technology	Algebra 2: SE/TE: 211
(Continued) CC.9-12.S.ID.6a 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.*	AR.9-12.DIP.AI.5.1 (DIP.5.AI.1) Construct and use scatter plots and line of best fit to make inferences in real life situations	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
	AR.9-12.DIP.AI.5.7 (DIP.5.AI.7) Recognize linear functions and non-linear functions by using a table or a graph	Algebra 1: SE/TE: 247-250 Algebra 2: SE/TE: 284
	AR.9-12.PS.AC.1.5 (PS.1.AC.5) Interpret and evaluate, with and without appropriate technology, graphical and tabular data displays for: -- consistency with the data, -- appropriateness of type of graph or data display, -- scale, -- overall message	Algebra 1: SE/TE: 726-731, 732-737, 738-744, 746-751, 753-759 TE: 731A Lesson Resources, 737A Lesson Resources, 751A Lesson Resources, 759A Lesson Resources Geometry: SE/TE: 83,111-112, 658, 660, 748 Algebra 2: SE/TE: 711-718 TE: 718A Lesson Resources
	AR.9-12.LF.TM.1.3 (LF.1.TM.3) Make inferences and predictions using: -- recursion on the table, -- inspection on the graph, -- algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566

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CC.9-12.S.ID.6a 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.*	AR.9-12.EF.TM.2.4 (EF.2.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566
	AR.9-12.MM.TM.3.3 (MM.3.TM.3) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, - - algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566
	AR.9-12.DAP.AII.6.4 (DAP.6.AII.4) Identify strengths and weaknesses of using regression equations to approximate data	Algebra 1: SE/TE: 336-337, 339, 340 Algebra 2: SE/TE: 94
CC.9-12.S.ID.6b Informally assess the fit of a function by plotting and analyzing residuals.*	AR.9-12.DA.S.5.5 (DA.5.S.5) Develop, use, and explain application and limitations of linear models and line of best fit (linear regression) in a variety of contexts	Algebra 1: SE/TE: 336-343 Algebra 2: SE/TE: 92-98
	AR.9-12.DIP.AI.5.1 (DIP.5.AI.1) Construct and use scatter plots and line of best fit to make inferences in real life situations	Algebra 1: SE/TE: 336-343 Algebra 2: SE/TE: 92-98
	AR.9-12.DAP.AII.6.4 (DAP.6.AII.4) Identify strengths and weaknesses of using regression equations to approximate data	Algebra 1: SE/TE: 336-337, 339, 340 Algebra 2: SE/TE: 94
CC.9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.*	AR.9-12.DA.S.5.5 (DA.5.S.5) Develop, use, and explain application and limitations of linear models and line of best fit (linear regression) in a variety of contexts	Algebra 1: SE/TE: 336-343 Algebra 2: SE/TE: 92-98

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(Continued) CC.9-12.S.ID.6c Fit a linear function for a scatter plot that suggests a linear association.*	AR.9-12.DAP.AII.6.1 (DAP.6.AII.1) Find regression line for scatter plot, using appropriate technology, and interpret the correlation coefficient	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
	AR.9-12.DIP.AI.5.1 (DIP.5.AI.1) Construct and use scatter plots and line of best fit to make inferences in real life situations	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
CC.9-12.S.ID.7 Interpret linear models. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.*	AR.9-12.DA.S.5.5 (DA.5.S.5) Develop, use, and explain application and limitations of linear models and line of best fit (linear regression) in a variety of contexts	Algebra 1: SE/TE: 336-343 Algebra 2: SE/TE: 92-98
	AR.9-12.LF.AI.3.5 (LF.3.AI.5) Interpret the rate of change/slope and intercepts within the context of everyday life	Algebra 1: SE/TE: 294-300 TE: 300A Lesson Resources Algebra 2: SE/TE: 74-80, 81-88 TE: 80A Lesson Resources, 88A Lesson Resources
	AR.9-12.LF.AI.3.9 (LF.3.AI.9) Describe the effects of parameter changes, slope and/or y-intercept, on graphs of linear functions and vice versa	Algebra 1: SE/TE: 308-312 Geometry: SE/TE: 189-195 TE: 196A Lesson Resources. Algebra 2: SE/TE: 77-80, 81-88 TE: 88A Lesson Resources, 80A Lesson Resources.

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	AR.9-12.LF.AC.2.4 (LF.2.AC.4) Interpret the rate of change (slope) and intercepts within the context of everyday life	Algebra 1: SE/TE: 294-300 Geometry: SE/TE: 189-196 TE: 196A Lesson Resources. Algebra 2: SE/TE: 447, 437, 500-504
CC.9-12.S.ID.8 Interpret linear models. Compute (using technology) and interpret the correlation coefficient of a linear fit.*	AR.9-12.DA.S.5.4 (DA.5.S.4) Identify possible correlations between variables in a data set	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
	AR.9-12.SI.S.11.4 (SI.11.S.4) Calculate and interpret the correlation coefficient of a set of data	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
	AR.9-12.DAP.AII.6.2 (DAP.6.AII.2) Interpret and use the correlation coefficient to assess the strength of the linear relationship between two variables	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources

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	AR.9-12.DAP.AII.6.4 (DAP.6.AII.4) Identify strengths and weaknesses of using regression equations to approximate data	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
CC.9-12.S.ID.9 Interpret linear models. Distinguish between correlation and causation.*	AR.9-12.DA.S.5.4 (DA.5.S.4) Identify possible correlations between variables in a data set	Algebra 1: SE/TE: 336-343 TE: 343A Lesson Resources Algebra 2: SE/TE: 92-98 TE: 98A Lesson Resources
	AR.9-12.DA.S.5.6 (DA.5.S.6) Use data from samples to make inferences about a population and determine whether claims are reasonable or unreasonable	Algebra 1: SE/TE: 753-759 Algebra 2: SE/TE: 725-730
	AR.9-12.DIP.AI.5.12 (DIP.5.AI.12) *Recognize when arguments based on data confuse correlation with causation	Algebra 1: SE/TE: 339-340

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	AR.9-12.PS.AC.1.2 (PS.1.AC.2) Conduct and interpret simple probability experiments using: -- manipulatives (spinners, dice, cards, coins), -- simulations (using random number tables, graphing calculators, or computer software)	Algebra 1: TE: 782A Geometry: SE/TE: 824-829, 830-835 TE: 829A, 835A Lesson Resources. Algebra 2: TE: 682, 694, 702, 705
	AR.9-12.PS.TM.4.1 (PS.4.TM.1) Formulate questions that can be addressed with data and, with appropriate technology, collect, organize, and display relevant data to answer the questions	Algebra 1: SE/TE: 785 Geometry: SE/TE: 864-867 TE: 867A Lesson Resources. Algebra 2: SE/TE: 739-745 TE: 745A-745B Lesson Resources.
CC.9-12.S.IC.3 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.* (Continued) CC.9-12.S.IC.3 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.*	AR.9-12.DC.S.2.4 (DC.2.S.4) Describe simple random sampling	Algebra 1: SE/TE: 755 Algebra 2: SE/TE: 725
	AR.9-12.PS.TM.4.4 (PS.4.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566
	AR.9-12.DA.TDM.5.2 (DA.5.TDM.2) Identify biases that affect the validity of a data set	Algebra 1: SE/TE: 755 Algebra 2: SE/TE: 726

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CC.9-12.S.IC.4 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. 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.*	AR.9-12.DC.S.2.8 (DC.2.S.8) Plan and conduct a survey to answer a question or address an issue, identify possible sources of bias, and describe ways to reduce bias	Algebra 1: SE/TE: 753-756 Algebra 2: SE/TE: 725-727
	AR.9-12.PS.TM.4.4 (PS.4.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566
CC.9-12.S.IC.5 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.*	AR.9-12.DC.S.3.5 (DC.3.S.5) Use simulations to develop an understanding of the Central Limit Theorem and its importance in confidence intervals and tests of significance	Algebra 1 SE/TE: 775 Algebra 2: SE/TE: 748-749
	AR.9-12.PS.TM.4.4 (PS.4.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566
CC.9-12.S.IC.6 Make inferences and justify conclusions from sample surveys, experiments, and observational studies. Evaluate reports based on data.*	AR.9-12.DC.S.3.3 (DC.3.S.3) Apply statistical principles and methods in sample surveys; identify difficulties	Algebra 1: SE/TE: 755 Algebra 2: SE/TE: 725
	AR.9-12.PS.TM.4.4 (PS.4.TM.4) Make inferences and predictions using: -- recursion on the table, -- inspection of the graph, -- algebraic manipulation on the model	Algebra 1: SE/TE: 253-255 Algebra 2: SE/TE: 92-98, 209-213, 331-334, 434-441, 565-566

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<p>CC.9-12.S.CP.1 Understand independence and conditional probability and use them to interpret data. 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”).*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources</p> <p>Algebra 2: SE/TE: 696702</p>
	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.3) Compute and display theoretical and experimental probability including the use of Venn diagrams: -- simple, -- complementary, -- compound (mutually exclusive, inclusive, independent and dependent events)</p>	<p>Algebra 1: SE/TE: 769-772, 776-779,</p> <p>Geometry: SE/TE: 844-849, 856-861</p> <p>Algebra 2: SE/TE: 681-684, 688-690</p>
	<p>AR.9-12.ST.TFM.2.1 (ST.2.TFM.1) Define sets using set-builder notation</p>	<p>Algebra 1: SE/TE: 194</p>
<p>CC.9-12.S.CP.1 Understand independence and conditional probability and use them to interpret data. 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”).*</p>	<p>AR.9-12.CT.TFM.3.5 (CT.3.TFM.5) Calculate probabilities of mutually exclusive events, independent events, and dependent events</p>	<p>Algebra 1: SE/TE: 776-777</p> <p>Geometry: SE/TE: 844-849 TE: 849A Lesson Resources.</p> <p>Algebra 2: SE/TE: 688-690</p>
	<p>AR.9-12.ST.TFM.2.3 (ST.2.TFM.3) Perform set operations such as union and intersection, complement, and Cartesian product</p>	<p>Geometry: SE/TE: 826</p>

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<p>CC.9-12.S.CP.2 Understand independence and conditional probability and use them to interpret data. 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.*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources</p> <p>Algebra 2: SE/TE: 696,702</p>
	<p>AR.9-12.CT.TFM.3.5 (CT.3.TFM.5) Calculate probabilities of mutually exclusive events, independent events, and dependent events</p>	<p>Algebra 1: SE/TE: 776-777</p> <p>Geometry: SE/TE: 844-849 TE: 849A Lesson Resources</p> <p>Algebra 2: SE/TE: 688-690</p>
<p>CC.9-12.S.CP.3 Understand independence and conditional probability and use them to interpret data. 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</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources</p> <p>Algebra 2: SE/TE: 696,702</p>

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<p>probability of A, and the conditional probability of B given A is the same as the probability of B.*</p>	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.3) Compute and display theoretical and experimental probability including the use of Venn diagrams: -- simple, -- complementary, -- compound (mutually exclusive, inclusive, independent and dependent events)</p>	<p>Algebra 1: SE/TE: 769-772, 776-779</p> <p>Geometry: SE/TE: 844-849, 856-861</p> <p>Algebra 2: SE/TE: 681-684, 688-690</p>
	<p>AR.9-12.CT.TFM.3.5 (CT.3.TFM.5) Calculate probabilities of mutually exclusive events, independent events, and dependent events</p>	<p>Algebra 1: SE/TE: 776-777</p> <p>Geometry: SE/TE: 844-849 TE: 849A Lesson Resources</p> <p>Algebra 2: SE/TE: 688-690</p>

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<p>CC.9-12.S.CP.4 Understand independence and conditional probability and use them to interpret data. 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.*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources</p> <p>Algebra 2: SE/TE: 696, 702</p>

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<p>CC.9-12.S.CP.5 Understand independence and conditional probability and use them to interpret data. 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.*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources</p> <p>Algebra 2: SE/TE: 696, 702</p>
	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.3) Compute and display theoretical and experimental probability including the use of Venn diagrams: -- simple, -- complementary, -- compound (mutually exclusive, inclusive, independent and dependent events)</p>	<p>Algebra 1: SE/TE: 769-772, 776-779</p> <p>Geometry: SE/TE: 844-849, 856-861</p> <p>Algebra 2: SE/TE: 681-684, 688-690</p>
	<p>AR.9-12.CT.TFM.3.5 (CT.3.TFM.5) Calculate probabilities of mutually exclusive events, independent events, and dependent events</p>	<p>Algebra 1: SE/TE: 776-777</p> <p>Geometry: SE/TE: 844-849 TE: 849A Lesson Resources</p> <p>Algebra 2: SE/TE: 688-690</p>
<p>CC.9-12.S.CP.6 Use the rules of probability to compute probabilities of compound events in a uniform probability model. 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.*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources.</p> <p>Algebra 2: SE/TE: 696, 702</p>

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<p>CC.9-12.S.CP.7 Use the rules of probability to compute probabilities of compound events in a uniform probability model. 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.*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A Lesson Resources</p> <p>Algebra 2: SE/TE: 696, 702</p>
	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.3) Compute and display theoretical and experimental probability including the use of Venn diagrams: -- simple, -- complementary, -- compound (mutually exclusive, inclusive, independent and dependent events)</p>	<p>Algebra 1: SE/TE: 769-772, 776-779,</p> <p>Geometry: SE/TE: 844-849, 856-861</p> <p>Algebra 2: SE/TE: 681-684, 688-690</p>
	<p>AR.9-12.CT.TFM.3.1 (CT.3.TFM.1) Use fundamental counting principles of addition and multiplication to solve problems</p>	<p>Algebra 1: SE/TE: 763</p> <p>Geometry: SE/TE: 836</p> <p>Algebra 2: SE/TE: 674</p>

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<p>CC.9-12.S.CP.8 (+) Use the rules of probability to compute probabilities of compound events in a uniform probability model. Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = [P(A)] \times [P(B A)] = [P(B)] \times [P(A B)]$, and interpret the answer in terms of the model.*</p>	<p>AR.9-12.P.S.6.6 (P.6.S.6) Find conditional probabilities for dependent, independent, and mutually exclusive events</p>	<p>Algebra 1: TE: 783</p> <p>Geometry: SE/TE: 844-849, 856-861 TE: 861A</p> <p>Algebra 2: SE/TE: 696,702</p>
	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.3) Compute and display theoretical and experimental probability including the use of Venn diagrams: -- simple, -- complementary, -- compound (mutually exclusive, inclusive, independent and dependent events)</p>	<p>Algebra 1: SE/TE: 769-772, 776-779,</p> <p>Geometry: SE/TE: 844-849, 856-861</p> <p>Algebra 2: SE/TE: 681-684, 688-690</p>
	<p>AR.9-12.CT.TFM.3.1 (CT.3.TFM.1) Use fundamental counting principles of addition and multiplication to solve problems</p>	<p>Algebra 1: SE/TE: 763</p> <p>Geometry: SE/TE: 836</p> <p>Algebra 2: SE/TE: 674</p>

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CC.9-12.S.CP.9 (+) Use the rules of probability to compute probabilities of compound events in a uniform probability model. Use permutations and combinations to compute probabilities of compound events and solve problems.*	AR.9-12.P.S.6.1 (P.6.S.1) Understand the counting principle, permutations and combinations and use them to solve problems	Algebra 1: SE/TE: 762-768 TE: 768A Lesson Resources Algebra 2: SE/TE: 674-680 TE: 680A Lesson Resources
	AR.9-12.P.S.6.2 (P.6.S.2) Compare and contrast permutations and combinations	Algebra 1: SE/TE: 764-765 Algebra 2: SE/TE: 676-677
	AR.9-12.P.S.6.3 (P.6.S.3) Calculate the number of permutations of n objects taken r at a time	Algebra 1: SE/TE: 764 Algebra 2: SE/TE: 676
	AR.9-12.P.S.6.4 (P.6.S.4) Calculate the number of combinations of n objects taken r at a time	Algebra 1: SE/TE: 765 Algebra 2: SE/TE: 676
	AR.9-12.PS.AC.1.1 (PS.1.AC.1) Apply counting techniques to determine the number of outcomes: -- tree diagram, -- fundamental Counting Principle, -- permutations (with and without repetition), -- combinations	Algebra 1: SE/TE: 762-768 Algebra 2: SE/TE: 676-677

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<p>(Continued) CC.9-12.S.CP.9 (+) Use the rules of probability to compute probabilities of compound events in a uniform probability model. Use permutations and combinations to compute probabilities of compound events and solve problems.*</p>	<p>AR.9-12.PS.TM.4.3 (PS.4.TM.3) Use counting methods, permutations, and combinations to evaluate the likelihood of events occurring</p>	<p>Algebra 2: SE/TE: 683</p>
	<p>AR.9-12.CT.TFM.3.2 (CT.3.TFM.2) Evaluate expressions indicating permutations or combinations, with and without technology</p>	<p>Algebra 2: SE/TE: 676</p>
	<p>AR.9-12.CT.TFM.3.3 (CT.3.TFM.3) Evaluate expressions involving distinguishable permutations</p>	<p>Studied in 4th year course</p>
	<p>AR.9-12.CT.TFM.3.4 (CT.3.TFM.4) Distinguish between and use permutations and combinations to solve problems</p>	<p>Studied in 4th year course</p>
<p>CC.9-12.S.MD.1 (+) Calculate expected values and use them to solve problems. Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.*</p>	<p>AR.9-12.P.S.7.1 (P.7.S.1) Compare and contrast independent and dependent random variables</p>	<p>Algebra 1: SE/TE: 777-782 TE: 782A Lesson Resources</p> <p>Algebra 2: SE/TE: 688-691 TE: 753</p>
	<p>AR.9-12.P.S.7.1 (P.7.S.1) Compare and contrast independent and dependent random variables</p>	<p>Algebra 1: SE/TE: 777-782</p> <p>Algebra 2: SE/TE: 687,538-691 TE: 753</p>
	<p>AR.9-12.P.S.7.2 (P.7.S.2) Find the standard deviation for sums and differences of independent random variables</p>	<p>Algebra 1: TE:745</p> <p>Algebra 2: SE/TE: 719-724 TE: 724A Lesson Resources</p>

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<p>CC.9-12.S.MD.2 (+) Calculate expected values and use them to solve problems. Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.*</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Algebra 2: SE/TE: 739-742 TE: 694</p>
<p>CC.9-12.S.MD.3 (+) Calculate expected values and use them to solve problems. Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.*</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Geometry: SE/TE: 564-867 TE: 867A Lesson Resources</p> <p>Algebra 2: SE/TE: 739-742 TE: 694</p>

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<p>CC.9-12.S.MD.4 (+) Calculate expected values and use them to solve problems. Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?*</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Geometry: SE/TE: 864-865</p> <p>Algebra 2: SE/TE: 739-742 TE: 694</p>
<p>CC.9-12.S.MD.5 (+) Use probability to evaluate outcomes of decisions. Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.*</p>	<p>AR.9-12.PS.TM.4.1 (PS.4.TM.1) Formulate questions that can be addressed with data and, with appropriate technology, collect, organize, and display relevant data to answer the questions</p>	<p>Algebra 1: SE/TE: 785</p> <p>Geometry: SE/TE: 864-867 TE: 867A</p> <p>Algebra 2: SE/TE: 739-745 TE: 745A-745B</p>
<p>CC.9-12.S.MD.5a (+) Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.*</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Geometry: SE/TE: 864-867 TE: 867A Lesson Resources</p>

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<p>CC.9-12.S.MD.5b (+) Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.*</p>	<p>No Matches in Arkansas Frameworks</p>	<p>Geometry: SE/TE: 864-867 TE: 867A Lesson Resources</p>
<p>CC.9-12.S.MD.6 (+) Use probability to evaluate outcomes of decisions. Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).*</p>	<p>AR.9-12.PS.TM.4.1 (PS.4.TM.1) Formulate questions that can be addressed with data and, with appropriate technology, collect, organize, and display relevant data to answer the questions</p>	<p>Algebra 1: TE: 783, 784</p> <p>Algebra 2: SE/TE: 703-708</p>
	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.4) Apply probability to real-world situations such as weather prediction, game theory, fair division, insurance tables, and election theory.</p>	<p>Algebra 1: SE/TE: 681-686, 729, 736, 786 TE: 787A-787B Lesson Resources</p> <p>Algebra 2: SE/TE: 759, 775, 778-781 TE: 782A Lesson Resources</p>
<p>CC.9-12.S.MD.7 (+) Use probability to evaluate outcomes of decisions. Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).*</p>	<p>AR.9-12.PS.TM.4.1 (PS.4.TM.1) Formulate questions that can be addressed with data and, with appropriate technology, collect, organize, and display relevant data to answer the questions</p>	<p>Algebra 1: TE: 783, 784</p> <p>Algebra 2: SE/TE: 703-708</p>
	<p>AR.9-12.PS.AC.1.3 (PS.1.AC.4) Apply probability to real-world situations such as weather prediction, game theory, fair division, insurance tables, and election theory.</p>	<p>Algebra 1: SE/TE: 681-686, 729, 736, 786 TE: 787A-787B Lesson Resources</p> <p>Algebra 2: SE/TE: 759, 775, 778-781 TE: 782A Lesson Resources</p>