Arkansas Algebra I Standards Correlated to Amsco Algebra 1 Lessons

	Arkansas Standard	Amsco Lesson
HSN.RN.B.3	Explain why • The sum/difference or product/quotient (where defined) of two rational numbers is rational; • The sum/difference of a rational number and an irrational number is irrational; • The product/quotient of a nonzero rational number and an irrational number is irrational; and • The product/quotient of two nonzero rationals is a nonzero rational.	9.1
HSN.RN.B.4	• Simplify radical expressions • Perform operations (add, subtract, multiply, and divide) with radical expressions • Rationalize denominators and/or numerators	1.7
HSN.Q.A.1	• 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.	2.3
HSN.Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (I.E., Use units appropriate to the problem being solved.)	3.8
HSN.Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	9.3
SA.SSE.A.1	Interpret expressions that represent a quantity in terms of its context.* • Interpret parts of an expression using appropriate vocabulary, such as terms, factors, and coefficients. • Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example: Interpret* $P(1 \pm r)^n$ *as the product of P and a factor not depending on P.*	8.9,9.3
HSA.SSE.A.2	Use the structure of an expression to identify ways to rewrite it. *For example: See that (x + 3)(x + 3) is the same as (x + 3)2 OR x4 - y4 as (x2)2 - (y2)2, thus recognizing it as a difference of squares that can be factored as* $(x^2 - y^2)(x^2 + y^2)$	6.1,6.6,6.7,7.1,7.3,7.3,7.4,8.1, 8.7
HSA.SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.* • Factor a quadratic expression to reveal the zeros of the function it defines. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. Note: Students should be able to identify and use various forms of a quadratic expression to solve problems. o Standard Form: $ax^2 + bx + c$ o Factored Form: $a(x - r1)(x - r2)$ o Vertex Form: $a\,(x - h\,)^2 + k$	8.2,8.9,9.2,9.3
	• Add, subtract, and multiply polynomials • Understand that polynomials, like the integers, are **closed** under addition, subtraction, and multiplication	6.1,6.2,6.3,6.4, 6.5,6.7
HSA.APR.B.3	• Identify zeros of polynomials (linear, quadratic only) when suitable factorizations are available • Use the zeros to construct a rough graph of the function defined by the polynomial.	8.4,8.5, 8.11
HSA.APR.C.4	Prove polynomial identities and use them to describe numerical relationships. *Note: Examples of Polynomial Identities may include but are not limited to the following:* • $(a + b)^2 = a^2 + 2ab + b^2$ *(Algebra 1)* • $a^2 - b^2 = (a - b)(a + b)$ *(Algebra 1)*	6.5,7.3
HSA.APR.D.7	• Add, subtract, multiply, and divide by nonzero rational expressions • Understand that rational expressions, like the integers, are closed under addition, subtraction, and multiplication	Covered in Amsco Algebra 2

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HSA.CED.A.1	Create equations and inequalities in one variable and use them to solve problems	2.4,2.6,8.9
HSA.CED.A.2	• Create equations in two or more variables to represent relationships between quantities • Graph equations, in two variables, on a coordinate plane.	3.8,8.2,8.9,9.3
HSA.CED.A.3	• Represent and interpret constraints by equations or inequalities, and by systems of equations and/or inequalities. • Interpret solutions as viable or nonviable options in a modeling and/or real-world context.	4.1,4.2,5.4,8.9, 9.3
HSA.CED.A.4	Rearrange literal equations using the properties of equality.	2.2
HSA.REI.A.1	Assuming that equations have a solution, construct a solution and justify the reasoning used.	2.1,8.2
HSA.REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. *For example: The area of a square equals 49 square inches. The length of the side is 7 inches. Although -7 is a solution to the equation, $x^2 = 49$, -7 is an extraneous solution.*	1.7,9.1
HSA.REI.B.3	Solve linear equations, inequalities and absolute value equations in one variable, including equations with coefficients represented by letters.	2.1,2.2,2.4,2.5, 2.6,4.2,4.5
HSA.REI.B.4	Solve quadratic equations in one variable. • 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.	8.2,8.3,8.6,8.8, 8.9
HSA.REI.C.5	• Solve systems of equations in two variables using substitution and elimination. • Understand that the solution to a system of equations will be the same when using substitution and elimination.	5.2,5.3
HSA.REI.C.6	Solve systems of equations algebraically and graphically.	5.1,5.2,5.3
HSA.REI.C.7	Solve systems of equations consisting of linear equations and nonlinear equations in two variables algebraically and graphically. *For example: Find the points of intersection between $y = -3x$ and $y = x^2 + 2$.*	8.10
HSA.REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.	3.5,8.4,8.11,9.2
HSA.REI.D.11	Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; Find the solutions approximately by • Using technology to graph the functions • Making tables of values • Finding successive approximations Include cases (but not limited to) where $f(x)$ and/or $g(x)$ are • Linear • Polynomial • Absolute value • Exponential (Introduction in Algebra 1, Mastery in Algebra 2)	5.1,8.10,9.3
HSA.REI.D.12	Solve linear inequalities and systems of linear inequalities in two variables by graphing.	4.1,5.4

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HSF.IF.A.1	• Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. • Understand that 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. • Understand that the graph of f is the graph of the equation $y = f(x)$.	3.5,8.11
HSF.IF.A.2	In terms of a real-world context: • Use function notation, • Evaluate functions for inputs in their domains, and • Interpret statements that use function notation.	3.5
HSF.IF.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example: The Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1$, $f(n + 1) = f(n) + (n - 1)$ *for* $n \geq 1$.	9.4,9.5
HSF.IF.B.4	For a function that models a relationship between two quantities: • Interpret key features of graphs and tables in terms of the quantities, and • Sketch graphs showing key features given a verbal description of the relationship.	3.8,8.9,9.3
HSF.IF.B.5	• Relate the domain of a function to its graph. • Relate the domain of a function to the quantitative relationship it describes.	3.8,8.9,9.3
HSF.IF.B.6	• Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. * • Estimate the rate of change from a graph.*	3.8,8.9,9.2,9.3
HSF.IF.C.7	Graph functions expressed algebraically and show key features of the graph, with and without technology. • Graph linear and quadratic functions and, when applicable, show intercepts, maxima, and minima. • Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. • Graph exponential functions, showing intercepts and end behavior.	3.8,4.3,4.4,8.9, 8.11,9.2,9.3
HSF.IF.C.8	Write expressions for functions in different but equivalent forms to reveal key features of the function. • Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values (vertex), and symmetry of the graph, and interpret these in terms of a context.	8.6,8.9,9.2,9.3
HSF.IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	9.2
HSF.BF.A.1	Write a function that describes a relationship between two quantities. * • From a context, determine an explicit expression, a recursive process, or steps for calculation.	3.6,3.8,9.4,9.5
HSF.BF.B.3	• Identify the effect on the graph of replacing $f(x)$ *by* $f(x) + k, k\,f(x), f(kx),$ and $f(x + k)$ for specific values of k (k, a constant both positive and negative); • Find the value of k given the graphs of the transformed functions. • Experiment with multiple transformations and illustrate an explanation of the effects on the graph with or without technology. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.*	4.4,8.7,9.2

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HSF.LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions. • Show that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. • Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. • Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	3.8,9.2,9.5
HSF.LE.A.2	Construct linear and exponential equations, including arithmetic and geometric sequences, • given a graph, • a description of a relationship, or • two input-output pairs (include reading these from a table).	3.8,9.4,9.5
HSF.LE.A.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or any polynomial function.	9.2
HSF.LE.B.5	In terms of a context, interpret the parameters (rates of growth or decay, domain and range restrictions where applicable, etc.) in a function.	3.8,9.3
HSS.ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).	10.1,10.3
HSS.ID.A.2	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.	10.2,10.3
HSS.ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). *For example: Be able to explain the effects of extremes or outliers on the measures of center and spread.*	10.1,10.2,10.3
HSS.ID.B.5	• 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.	10.6
HSS.ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. • Fit a function to the data; use functions fitted to data to solve problems in the context of the data.	10.4,10.5
HSS.ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	10.4
HSS.ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.	10.4
HSS.ID.C.9	Distinguish between correlation and causation.	10.4