

Arkansas Algebra II Standards correlated to Amsco Algebra 2 Lessons

Arkansas Standard		Amsco Lesson
HSN.RN.A.1	Explain how extending the properties of integer exponents to rational exponents provides an alternative notation for radicals.	5.3
HSN.RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	5.1,5.2,5.3
HSN.RN.B.4	Simplify radical expressions Perform operations (add, subtract, multiply, and divide) with radical expressions Rationalize denominators and/or numerators	5.1,5.2
HSN.Q.A.2	Define appropriate quantities for the purpose of descriptive modeling. (I.E., Use units appropriate to the problem being solved.)	1.3
HSN.CN.A.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.	2.5
HSN.CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.	2.5
HSN.CN.A.3	Find the conjugate of a complex number. Use conjugates to find quotients of complex numbers.	2.5
HSN.CN.C.7	Solve quadratic equations with real coefficients that have real or complex solutions.	2.3,2.4,2.6
HSN.CN.C.8	(+) Extend polynomial identities to the complex numbers. For example: Rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$.	2.5
HSN.CN.C.9	(+) Know the Fundamental Theorem of Algebra (+) Show that it is true for quadratic polynomials.	3.5
HSA.SSE.A.1	Interpret expressions that represent a quantity in terms of its context. <ul style="list-style-type: none"> • 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 .	1.3,1.4,3.4,4.1, 4.2,6.2
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 $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.	R.5,2.1,2.2,2.3, 3.1,4.1,4.2,5.3, 7.6

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HSA.SSE.B.3	<p>Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.</p> <ul style="list-style-type: none"> • Factor a quadratic expression to reveal the zeros of the function it defines. <p>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.</p> <ul style="list-style-type: none"> ○ Standard Form ○ Factored Form ○ Vertex Form <ul style="list-style-type: none"> • Use the properties of exponents to transform expressions for exponential functions. 	2.1,2.2,2.3,2.4, 6.2
HSA.APR.A.1	<ul style="list-style-type: none"> • Add, subtract, and multiply polynomials • Understand that polynomials, like the integers, are closed under addition, subtraction, and multiplication 	R.5
HSA.APR.B.2	<p>Know and apply the Factor and Remainder Theorems: 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>	3.3
HSA.APR.B.3	<ul style="list-style-type: none"> • Identify zeros of polynomials when suitable factorizations are available • Use the zeros to construct a rough graph of the function defined by the polynomial. 	3.4,3.5
HSA.APR.C.4	<p>Prove polynomial identities and use them to describe numerical relationships. $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples (Algebra 2).</p>	2.3
HSA.APR.D.6	<p>Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, (where $a(x)$ is the dividend, $b(x)$ is the divisor, $q(x)$ is the quotient, and $r(x)$ is the remainder) 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.</p>	3.2,4.1,4.2
HSA.APR.D.7	<ul style="list-style-type: none"> • Add, subtract, multiply, and divide by nonzero rational expressions • Understand that rational expressions, like the integers, are closed under addition, subtraction, and multiplication 	4.1,4.2
HSA.CED.A.1	<p>Create equations and inequalities in one variable and use them to solve problems. Note: Including but not limited to equations arising from:</p> <ul style="list-style-type: none"> • Linear functions • Quadratic functions • Simple rational functions • Exponential functions • Absolute value functions 	R.1,4.3,7.5
HSA.CED.A.2	<ul style="list-style-type: none"> • Create equations in two or more variables to represent relationships between quantities • Graph equations, in two variables, on a coordinate plane. 	2.7,3.8

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HSA.CED.A.3	<ul style="list-style-type: none"> • 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. 	R.4,1.3,3.8
HSA.CED.A.4	Rearrange literal equations using the properties of equality	R.1
HSA.REI.A.1	Assuming that equations have a solution, construct a solution and justify the reasoning used.	4.3,5.4
HSA.REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	4.3,5.4
HSA.REI.B.4	<p>Solve quadratic equations in one variable.</p> <ul style="list-style-type: none"> • 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. • Solve quadratic equations (as appropriate to the initial form of the equation) by: <ul style="list-style-type: none"> ○ Inspection of a graph ○ Taking square roots ○ Completing the square <ul style="list-style-type: none"> ○ Using the quadratic formula ○ Factoring <p>Recognize complex solutions and write them as $a \pm bi$ for real numbers a and b.</p>	2.4,2.6
HSA.REI.C.5	<ul style="list-style-type: none"> • 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. 	R.4
HSA.REI.C.6	Solve systems of equations algebraically and graphically.	R.4, 1.4
HSA.REI.C.7	Solve systems of equations consisting of linear equations and nonlinear equations in two variables algebraically and graphically.	3.9
HSA.REI.C.8	(+) Represent a system of linear equations as a single matrix equation in a vector variable.	Covered in Amsco Pre-Calculus
HSA.REI.C.9	(+) 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).	

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HSA.REI.D.11	<p>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 $f(x) = g(x)$;</p> <p>Find the solutions approximately by</p> <ul style="list-style-type: none"> • Using technology to graph the functions • Making tables of values • Finding successive approximations <p>Include cases (but not limited to) where $f(x)$ and/or $g(x)$ are</p> <ul style="list-style-type: none"> • Linear • Polynomial • Rational • Exponential • Logarithmic functions 	R.4,3.9,4.4,7.2
HSA.REI.D.12	Solve linear inequalities and systems of linear inequalities in two variables by graphing.	R.4
HSF.IF.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	8.1,8.3
HSF.IF.B.4	<p>For a function that models a relationship between two quantities:</p> <ul style="list-style-type: none"> • 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. 	2.7,2.8,3.8,4.4, 6.2,7.5,9.5
HSF.IF.B.6	<ul style="list-style-type: none"> • 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. 	3.8,6.1,7.5
HSF.IF.C.7	<p>Graph functions expressed algebraically and show key features of the graph, with and without technology.</p> <ul style="list-style-type: none"> • Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. • (+) Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. • Graph exponential and logarithmic functions, showing intercepts and end behavior. • (+) Graph trigonometric functions, showing period, midline, and amplitude. 	3.5,3.8,5.5,6.2, 7.5,9.5
HSF.IF.C.8	<p>Write expressions for functions in different but equivalent forms to reveal key features of the function.</p> <ul style="list-style-type: none"> • Use the properties of exponents to interpret expressions for exponential functions. 	2.6,6.1

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HSF.BF.A.1	<p>Write a function that describes a relationship between two quantities.</p> <ul style="list-style-type: none"> From a context, determine an explicit expression, a recursive process, or steps for calculation. Combine standard function types using arithmetic operations. (e.g., given that $f(x)$ and $g(x)$ are functions developed from a context, find $(f + g)(x)$, $(f - g)(x)$, $(fg)(x)$, $(f/g)(x)$, and any combination thereof, given $g(x) \neq 0$.) Compose functions. 	1.3,6.3,8.1,8.3
HSF.BF.A.2	<ul style="list-style-type: none"> Write arithmetic and geometric sequences both recursively and with an explicit formula, and translate between the two forms. Use arithmetic and geometric sequences to model situations 	8.1,8.3
HSF.BF.B.3	<ul style="list-style-type: none"> 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. 	R.6,3.7,4.4,5.5, 6.1,7.2,9.5
HSF.BF.B.4	<ul style="list-style-type: none"> Find inverse functions. Solve an equation for a simple function f that has an inverse and write an expression for the inverse. Verify by composition that one function is the inverse of another. Read values of an inverse function from a graph or a table, given that the function has an inverse. (+) Produce an invertible function from a non-invertible function by restricting the domain. 	6.4
HSF.IF.B.5	<ul style="list-style-type: none"> Relate the domain of a function to its graph. Relate the domain of a function to the quantitative relationship it describes 	1.1
HSF.LE.A.2	<p>Construct linear and exponential equations, including arithmetic and geometric sequences,</p> <ul style="list-style-type: none"> given a graph, a description of a relationship two input-output pairs (include reading these from a table). 	R.2,1.2,6.2,8.1, 8.3
HSF.LE.A.4	<ul style="list-style-type: none"> Express exponential models as logarithms Express logarithmic models as exponentials Use properties of logarithms to simplify and evaluate logarithmic expressions (expanding and/or condensing logarithms as appropriate) Evaluate logarithms with or without technology 	7.1,7.3,7.4,7.6

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HSS.ID.A.4	<ul style="list-style-type: none"> • 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 and/or spreadsheets to estimate areas under the normal curve. 	10.5
HSS.ID.B.6	<p>Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.</p> <ul style="list-style-type: none"> • Fit a function to the data; use functions fitted to data to solve problems in the context of the data. 	2.7,6.2,9.7
HSS.IC.A.1	Recognize statistics as a process for making inferences about population parameters based on a random sample from that population.	10.6,10.7
HSS.IC.A.2	Compare theoretical and empirical probabilities using simulations (e.g. such as flipping a coin, rolling a number cube, spinning a spinner, and technology).	10.6,10.7
HSS.IC.B.3	<ul style="list-style-type: none"> • Recognize the purposes of and differences among sample surveys, experiments, and observational studies • Explain how randomization relates to sample surveys, experiments, and observational studies 	10.6,10.7
HSS.IC.B.6	<p>Read and explain, in context, the validity of data from outside reports by</p> <ul style="list-style-type: none"> • Identifying the variables as quantitative or categorical. • Describing how the data was collected. • Indicating any potential biases or flaws. • Identifying inferences the author of the report made from sample data. 	10.7