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HMH

Algebra 2

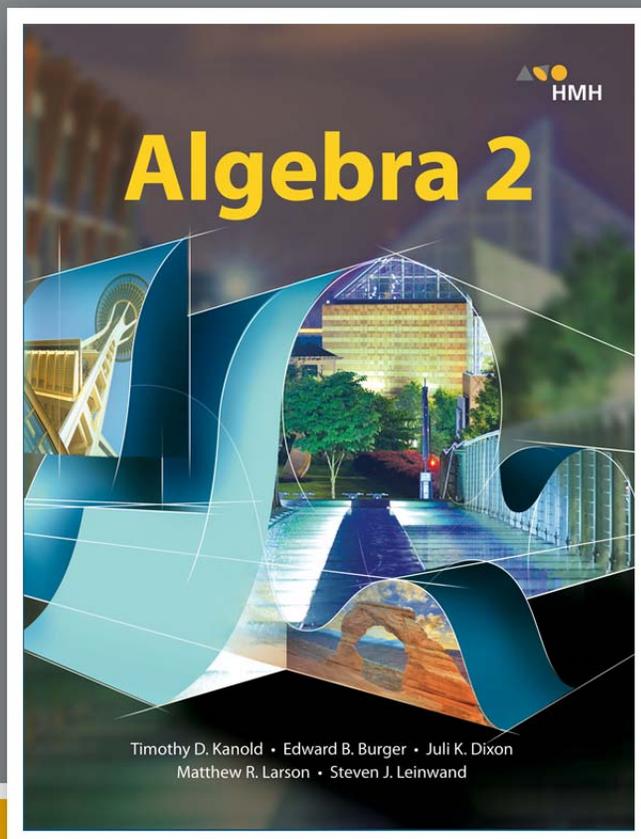Timothy D. Kanold · Edward B. Burger · Juli K. Dixon
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Correlation to the
Oklahoma Academic Standards
for Mathematics
Algebra 2

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Citations	Standard	Descriptor
Number & Operations (N)		
A2.N.1 Extend the understanding of number and operations to include complex numbers, matrices, radical expressions, and expressions written with rational exponents.		
OK Planning Guide: 98A-98C	A2.N.1.1	Find the value of i^n for any whole number n.
SE: 91-98 OK Planning Guide: 98A-98C	A2.N.1.2	Simplify, add, subtract, multiply, and divide complex numbers.
OK Planning Guide: 25.2A-25.2G	A2.N.1.3	Use matrices to organize and represent data. Identify the order (dimension) of a matrix, add and subtract matrices of appropriate dimensions, and multiply a matrix by a scalar to create a new matrix to solve problems.
SE: 381-388, 389-400	A2.N.1.4	Understand and apply the relationship of rational exponents to integer exponents and radicals to solve problems.
Algebraic Reasoning & Algebra (A)		
A2.A.1 Represent and solve mathematical and real-world problems using nonlinear equations and systems of linear equations; interpret the solutions in the original context.		
SE: 83-90, 99-108 OK Planning Guide: 0.3A-0.3J, 0.4A-J, 0.5A-0.5H, 0.6A-0.6L, 0.7A-0.7H	A2.A.1.1	Represent real-world or mathematical problems using quadratic equations and solve using various methods (including graphing calculator or other appropriate technology), factoring, completing the square, and the quadratic formula. Find non-real roots when they exist.
SE: 463-472, 473-484, 485-494, 495-504	A2.A.1.2	Represent real-world or mathematical problems using exponential equations, such as compound interest, depreciation, and population growth, and solve these equations graphically (including graphing calculator or other appropriate technology) or algebraically.

Citations	Standard	Descriptor
SE: 325-332	A2.A.1.3	Solve one-variable rational equations and check for extraneous solutions.
SE: 247-254, 255-264	A2.A.1.4	Solve polynomial equations with real roots using various methods and tools that may include factoring, polynomial division, synthetic division, graphing calculators or other appropriate technology.
SE: 401-410	A2.A.1.5	Solve square root equations with one variable and check for extraneous solutions.
OK Planning Guide: 578A-578C	A2.A.1.6	Solve common and natural logarithmic equations using the properties of logarithms.
SE: 423-432, 433-444, 445-456 OK Planning Guide: 432A-432C	A2.A.1.7	Solve real-world and mathematical problems that can be modeled using arithmetic or finite geometric sequences or series given the *n*th terms and sum formulas. Graphing calculators or other appropriate technology may be used.
SE: 145-158	A2.A.1.8	Represent real-world or mathematical problems using systems of linear equations with a maximum of three variables and solve using various methods that may include substitution, elimination, and graphing (may include graphing calculators or other appropriate technology)
SE: 135-144	A2.A.1.9	Solve systems of equations containing one linear equation and one quadratic equation using tools that may include graphing calculators or other appropriate technology.
A2.A.2 Represent and analyze mathematical situations and structures using algebraic symbols using various strategies to write equivalent forms of expressions.		
SE: 223-230	A2.A.2.1	Factor polynomial expressions including but not limited to trinomials, differences of squares, sum and difference of cubes, and factoring by grouping using a variety of tools and strategies.
SE: 199-206, 207-214, 231-240, 309-316, 317-324	A2.A.2.2	Add, subtract, multiply, divide, and simplify polynomial and rational expressions.

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The Oklahoma Academic Standards for Mathematics, Algebra 2

Citations	Standard	Descriptor
SE: 23-34 OK Planning Guide: 0.1A-0.1I, 0.2A-0.2G	A2.A.2.3	Recognize that a quadratic function has different equivalent representations $[f(x) = ax^2 + bx + c, f(x) = a(x - h)^2 + k$, and $f(x) = (x - h)(x - k)]$. Identify and use the representation that is most appropriate to solve real-world and mathematical problems.
SE: 389-400	A2.A.2.4	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
Functions (F)		
A2.F.1 Understand functions as descriptions of covariation (how related quantities vary together) in real-world and mathematical problems.		
SE: 5-12, 23-34, 171-180, 181-192, 277-290, 291-302, 345-354, 355-364, 365-374, 463-472, 473-484, 485-494, 541-553, 553-654	A2.F.1.1	Use algebraic, interval, and set notations to specify the domain and range of functions of various types and evaluate a function at a given point in its domain.
SE: 23-34, 345-354, 355-364, 365-374, 463-472, 473-484, 485-494, 523-534, 541-552, 553-564	A2.F.1.2	Recognize the graphs of exponential, radical (square root and cube root only), quadratic, and logarithmic functions. Predict the effects of transformations $[f(x + c), f(x) + c, f(cx)$, and $cf(x)$, where c is a positive or negative real-valued constant] algebraically and graphically, using various methods and tools that may include graphing calculators or other appropriate technology.
SE: 23-34, 523-534 OK Planning Guide: 0.1A-0.1I, 0.2A-0.2G	A2.F.1.3	Graph a quadratic function. Identify the x- and y-intercepts, maximum or minimum value, axis of symmetry, and vertex using various methods and tools that may include a graphing calculator or appropriate technology.
SE: 463-472, 473-484, 485-494, 541-552, 553-564	A2.F.1.4	Graph exponential and logarithmic functions. Identify asymptotes and x- and y-intercepts using various methods and tools that may include graphing calculators or other appropriate technology. Recognize exponential decay and growth graphically and algebraically.
SE: 171-180, 181-192	A2.F.1.5	Analyze the graph of a polynomial function by identifying the domain, range, intercepts, zeros, relative maxima, relative minima, and intervals of increase and decrease.

Citations	Standard	Descriptor
SE: 277-290, 291-302	A2.F.1.6	Graph a rational function and identify the *x*- and *y*-intercepts, vertical and horizontal asymptotes, using various methods and tools that may include a graphing calculator or other appropriate technology. (Excluding slant or oblique asymptotes and holes.)
SE: 345-354, 355-364, 365-374	A2.F.1.7	Graph a radical function (square root and cube root only) and identify the *x*- and *y*-intercepts using various methods and tools that may include a graphing calculator or other appropriate technology.
OK Planning Guide: 534A-534D	A2.F.1.8	Graph piecewise functions with no more than three branches (including linear, quadratic, or exponential branches) and analyze the function by identifying the domain, range, intercepts, and intervals for which it is increasing, decreasing, and constant.
A2.F.2 Analyze functions through algebraic combinations, compositions, and inverses, if they exist.		
SE: 199-206, 207-214, 231-240, 309-316, 317-324	A2.F.2.1	Add, subtract, multiply, and divide functions using function notation and recognize domain restrictions.
SE: 35-42 OK Planning Guide: 42A-42C	A2.F.2.2	Combine functions by composition and recognize that $g(x) = f^{-1}(x)$, the inverse function of $f(x)$, if and only if $f(g(x)) = g(f(x)) = x$.
SE: 35-42, 345-354, 541-552	A2.F.2.3	Find and graph the inverse of a function, if it exists, in real-world and mathematical situations. Know that the domain of a function f is the range of the inverse function f^{-1}, and the range of the function f is the domain of the inverse function f^{-1}.
SE: 541-552, 571-578	A2.F.2.4	Apply the inverse relationship between exponential and logarithmic functions to convert from one form to another.

Citations	Standard	Descriptor
Data & Probability (D)		
A2.D.1 Display, describe, and compare data. For linear and nonlinear relationships, make predictions and assess the reliability of those predictions.		
SE: 829-836, OK Planning Guide: 25.3A-25.3E, 25.4A-25.4F	A2.D.1.1	Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve).
SE: 13-22, 511-522, 523-534	A2.D.1.2	Collect data and use scatterplots to analyze patterns and describe linear, exponential or quadratic relationships between two variables. Using graphing calculators or other appropriate technology, determine regression equation and correlation coefficients; use regression equations to make predictions and correlation coefficients to assess the reliability of those predictions.
OK Planning Guide: 484A-484D	A2.D.1.3	Based upon a real-world context, recognize whether a discrete or continuous graphical representation is appropriate and then create the graph.
A2.D.2 Analyze statistical thinking to draw inferences, make predictions, and justify conclusions.		
SE: 865-874 OK Planning Guide: 25.1A-25.1F	A2.D.2.1	Evaluate reports based on data published in the media by identifying the source of the data, the design of the study, and the way the data are analyzed and displayed. Given spreadsheets, tables, or graphs, recognize and analyze distortions in data displays. Show how graphs and data can be distorted to support different points of view.
OK Planning Guide: 22A-22D, 25.3A-25.3E	A2.D.2.2	Identify and explain misleading uses of data. Recognize when arguments based on data confuse correlation and causation.