Oklahoma Academic Standards Alignment

A2.N.1.1 Find the value of i^n for any whole number n.	4.1 Complex Numbers
A2.N.1.2 Simplify, add, subtract, multiply, and divide complex numbers.	4.1 Complex Numbers
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.	10.1 Matrix Operations
A2.N.1.4 Understand and apply the relationship of rational exponents to integer exponents and radicals to solve problems.	7.2 Rational Exponents
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.	Chap. 3 Quadratic Functions and Equations 4.2 Quadratic Equations with Complex Solutions *Address "real-world" through tasks, not notes.*
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.	8.1, 8.3, 8.4, 8.5 *Address "real-world" through tasks, not notes.*
A2.A.1.3 Solve one-variable rational equations and check for extraneous solutions.	6.4 Rational Equations
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.	5.4 Polynomial Division 5.5 Factoring Polynomials
A2.A.1.5 Solve square root equations with one variable and check for extraneous solutions.	7.3 Square Root Equations
A2.A.1.6 Solve common and natural logarithmic equations using the properties of logarithms.	8.2 Logarithms 8.5 Exponential and Logarithmic Equations
A2.A.1.7 Solve real-world and mathematical problems that can be modeled using arithmetic or finite geometric sequences or series given the nth terms and sum formulas. Graphing calculators or other appropriate technology may be used.	Chap. 11 Sequences and Series *Address "real-world" through tasks, not notes.*
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).	2.3 Systems of Linear Equations *Address "real-world" through tasks, not notes.*
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.	4.3 Systems Involving Quadratic Equations
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.	3.4, 3.5, 5.3, 5.5 *Factoring by grouping not included, will add to 5.5 in future.*
A2.A.2.2 Add, subtract, multiply, divide, and simplify polynomial and rational expressions.	5.1 Polynomial Concepts 5.4 Polynomial Division
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.	Chap. 3 Quadratic Functions and Equations *Address "real-world" through tasks, not notes.*
A2.A.2.4 Rewrite expressions involving radicals and rational exponents using the properties of exponents.	7.1 Radical Expression Concepts 7.2 Rational Exponents

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.	1.1 Sets 1.2 Introduction to Functions Reinforced in 1.3, 1.4, 2.1, 2.2, 2.5, 3.1, 3.7, 5.2, 5.6, 6.5, 6.6, 7.4, 7.5, 7.6, 8.1, 8.3, 8.4, 9.2, 9.3, 9.4
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.	1.4 Transformations 3.1 Quadratics in Vertex Form 7.4 Square Root Functions 7.5 Cube Root Functions 8.1 Exponential Functions 8.3 Logarithmic Functions 9.1 Identifying Functions
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.	Chap. 3 Quadratic Functions and Equations
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.	8.1 Exponential Functions 8.3 Logarithmic Functions 8.4 Natural Exponents and Logarithms
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.	5.6 Graphs of Polynomial Functions
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.)	6.5 Simple Rational Functions 6.6 Functions with Quadratic Denominators
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.	7.4 Square Root Functions 7.5 Cube Root Functions
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.	2.5 Piecewise Linear Functions 9.4 Piecewise Functions
A2.F.2.1 Add, subtract, multiply, and divide functions using function notation and recognize domain restrictions.	9.2 Algebraic Combinations of Functions
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 $f(g(x)) = g(f(x)) = x$.	9.3 Function Composition
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}.	1.3 Inverse Functions and Solving Equations 2.2 Inverses of Linear Functions 6.5 Simple Linear Functions 7.6 Quadratics, Cubics and Roots as Inverses
A2.F.2.4 Apply the inverse relationship between exponential and logarithmic functions to convert from one form to another.	8.2 Logarithms 8.4 Natural Exponents and Logarithms 8.5 Exponential and Logarithmic Equations
A2.D.1.1 Use the mean and standard deviation of a data set to fit it to a normal distribution (bell-shaped curve).	12.1 Statistical Concepts 12.2 Normal Distributions

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.	2.4 Linear Regression 4.4 Quadratic Regression 8.6 Exponential Regression 12.3 Bivariate Data
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.	12.1 Statistical Concepts 12.4 Collecting and Presenting Data
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.	12.4 Collecting and Presenting Data
A2.D.2.2 Identify and explain misleading uses of data. Recognize when arguments based on data confuse correlation and causation.	12.3 Bivariate Data 12.4 Collecting and Presenting Data

Orphaned Topics are not explicitly required by the standards, but are included to improve the cohesiveness of the course:

2.1 Linear Functions is a conceptual link between the content of Chap. 1: Functions, and previous knowledge of linear functions from Algebra 1, in preparation for the new families of functions in the rest of the course.

2.5 Piecewise Linear Functions explains absolute value functions in the context of domain, range and transformations. While absolute value functions are not required in the standards, they are part of Algebra 1. Presenting them here allows an exploration of a many-to-one function with which students are familiar, before introducing quadratic functions in the next chapter.

5.2 Cubic Functions are included as the inverses of cube root functions, which are required in the standards, and as an additional example of a function family which can be analyzed using transformations, extending the pattern of behavior established for linear and quadratic functions.

10.2 Solving Linear Systems with Matrices provides an important application of matrices by linking them to systems of linear equations from earlier in the course. Teachers may safely ignore this section.