Oklahoma Academic Standards Alignment

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 ex- create a new matrix to solve problems. 7.2 Rational Exponents and radicals to solve problems. A2.N.1.4 Understand and apply the relationship of rational ex- complexing the equater, and the quadratic formula. Find non-real roots when they exist. 7.2 Rational Exponents 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 A2.A.1.3 Olve one-wariable rational equations with real roots using var- riate technology. 6.4 Rational Equations A2.A.1.5 Solve solutions. 5.4 Polynomial Division A2.A.1.5 Solve real-world and mathematical problems that can be modeled using arithmetic or finite geometric sequences or se- rise given the thet terms and sum formulas. Craphing calculators or other appropriate technology. 7.3 Square Root Equations A2.A.1.5 Solve common and natural logarithmic equations 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	A2.N.1.1 Find the value of i^n for any whole number n .	4.1 Complex Numbers
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mial and rational expressions.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 mathematical5.4 Polynomial Division	A2.A.2.2 Add, subtract, multiply, divide, and simplify polyno-	5.1 Polynomial Concepts
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equivalent representations $[f(x) = ax^2 + bx + c, f(x) = a(x-h)^2 + Address$ "real-world" through tasks, not notes. k and $f(x) = (x-h)(x-k)$]. Identify and use the representation that is most appropriate to solve real-world and mathematical	A2.A.2.3 Recognize that a quadratic function has different	Chap. 3 Quadratic Functions and Equations
k and $f(x) = (x-h)(x-k)$]. Identify and use the representation that is most appropriate to solve real-world and mathematical	equivalent representations $[f(x) = ax^2 + bx + c, f(x) = a(x-h)^2 + bx + c$	Address "real-world" through tasks. not notes.
that is most appropriate to solve real-world and mathematical	k and $f(x) = (x-h)(x-k)$. Identify and use the representation	
	that is most appropriate to solve real-world and mathematical	
problems.	problems.	
A2.A.2.4 Rewrite expressions involving radicals and rational 7.1 Radical Expression Concepts	A2.A.2.4 Rewrite expressions involving radicals and rational	7.1 Radical Expression Concepts
exponents using the properties of exponents. 7.2 Rational Exponents	exponents using the properties of exponents.	7.2 Rational Exponents

A2.F.1.1 Use algebraic, interval, and set notations to specify	1.1 Sets
the domain and range of functions of various types and evaluate	1.2 Introduction to Functions
a function at a given point in its domain.	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	1.4 Transformations
root and cube root only), quadratic, and logarithmic functions.	3.1 Quadratics in Vertex Form
Predict the effects of transformations $[f(x+c), f(x) + c, f(cx)]$	7.4 Square Root Functions
and $cf(x)$, where c is a positive or negative real-valued constant	7.5 Cube Root Functions
algebraically and graphically, using various methods and tools	8.1 Exponential Functions
that may include graphing calculators or other appropriate tech-	8.3 Logarithmic Functions
nology.	9.1 Identifying Functions
A2.F.1.3 Graph a quadratic function. Identify the x- and y-	Chap. 3 Quadratic Functions and Equations
intercepts, maximum or minimum value, axis of symmetry, and	
vertex using various methods and tools that may include a graph-	
ing calculator or appropriate technology.	
A2.F.1.4 Graph exponential and logarithmic functions. Identify	8.1 Exponential Functions
asymptotes and x- and y-intercepts using various methods and	8.3 Logarithmic Functions
tools that may include graphing calculators or other appropriate	8.4 Natural Exponents and Logarithms
technology. Recognize exponential decay and growth graphically	
and algebraically.	
A2.F.1.5 Analyze the graph of a polynomial function by iden-	5.6 Graphs of Polynomial Functions
tifying the domain, range, intercepts, zeros, relative maxima,	
relative minima, and intervals of increase and decrease.	
A2.F.1.6 Graph a rational function and identify the x- and	6.5 Simple Rational Functions
y-intercepts, vertical and horizontal asymptotes, using vari-	6.6 Functions with Quadratic Denominators
ous methods and tools that may include a graphing calculator	
or other appropriate technology. (Excluding slant or oblique	
asymptotes and holes.)	
A2.F.1.7 Graph a radical function (square root and cube root	7.4 Square Root Functions
only) and identify the x- and y-intercepts using various meth-	7.5 Cube Root Functions
ods and tools that may include a graphing calculator or other	
appropriate technology.	
A2.F.1.8 Graph piecewise functions with no more than three	2.5 Piecewise Linear Functions
branches (including linear, quadratic, or exponential branches)	9.4 Piecewise Functions
and analyze the function by identifying the domain, range, in-	
tercepts, and intervals for which it is increasing, decreasing, and	
constant.	
A2.F.2.1 Add, subtract, multiply, and divide functions using	9.2 Algebraic Combinations of Functions
function notation and recognize domain restrictions.	
A2.F.2.2 Combine functions by composition and recognize that	9.3 Function Composition
$g(x) = f^{-1}(x)$, the inverse function of $f(x)$, if and only if	
f(g(x)) = g(f(x)) = x.	
A2.F.2.3 Find and graph the inverse of a function, if it exists, in	1.3 Inverse Functions and Solving Equations
real-world and mathematical situations. Know that the domain	2.2 Inverses of Linear Functions
of a function f is the range of the inverse function f^{-1} , and the	6.5 Simple Linear Functions
range of the function f is the domain of the inverse function f^{-1} .	7.6 Quadratics, Cubics and Roots as Inverses
A2.F.2.4 Apply the inverse relationship between exponential	8.2 Logarithms
and logarithmic functions to convert from one form to another.	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	12.1 Statistical Concepts
fit it to a normal distribution (bell-shaped curve).	12.2 Normal Distributions

A 2 D 1 2 Collect data and use scatterplots to analyze patterns	2.4 Linear Begression
and describe linear exponential or quadratic relationships be	4.4 Quedretia Regression
and describe linear, exponential or quadratic relationships be-	4.4 Quadratic Regression
tween two variables. Using graphing calculators or other appro-	8.6 Exponential Regression
priate technology, determine regression equation and correlation	12.3 Bivariate Data
coefficients; use regression equations to make predictions and cor-	
relation coefficients to assess the reliability of those predictions.	
A2.D.1.3 Based upon a real-world context, recognize whether	12.1 Statistical Concepts
a discrete or continuous graphical representation is appropriate	12.4 Collecting and Presenting Data
and then create the graph.	
A2.D.2.1 Evaluate reports based on data published in the me-	12.4 Collecting and Presenting Data
dia by identifying the source of the data, the design of the study,	
and the way the data are analyzed and displayed. Given spread-	
sheets, tables, or graphs, recognize and analyze distortions in	
data displays. Show how graphs and data can be distorted to	
support different points of view.	
A2.D.2.2 Identify and explain misleading uses of data. Rec-	12.3 Bivariate Data
ognize when arguments based on data confuse correlation and	12.4 Collecting and Presenting Data
causation.	

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.