2023-2024
Jackson County Schools
Algebra II w/ Statistics Mathematics Pacing Guide

1st Quarter

Piecewise, Radical, Quadrilateral, and the Square Root Functions

***Focus Standard 13- Two Variable Equations (Radical & Piecewise)** Proficiency Scale
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales and use them to make predictions. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 11- Solving Quadratic Equations** Proficiency Scale
Solve quadratic equations with real coefficients that have complex solutions.

***Focus Standards 16- Parent Functions and Transformations (Radical & Piecewise)** Proficiency Scale
Identify the effect on the graph of replacing f(x) by f(x) + k, k*f(x), f(k*x), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 20f- Characteristics of Graphs (Square Root & Quadrilateral)** Proficiency Scale
Compare the graphs of inverse functions and the relationships between their key features, including but not limited to quadratic, square root, exponential, and logarithmic.

***Focus Standard 1- Complex Numbers** Proficiency Scale
Identify numbers written in the form a + bi, where a and b are real numbers and $i^2 = -1$, as complex numbers.

Standard 12- Solving Equations (Radical)
Solve simple equations involving exponential, radical, logarithmic, and trigonometric functions using inverse functions.

Standard 8- Explaining extraneous solutions
Explain why extraneous solutions to an equation may arise and how to check to be sure that a candidate solution satisfies an equation.

2nd Quarter

Polynomial, Exponential, and Logarithmic Functions

***Focus Standard 13- Two Variable Equations (Polynomial & Logs)** Proficiency Scale
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales and use them to make predictions. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 9- Exponential Models and Logarithms** Proficiency Scale
For exponential models, express as a logarithm the solution to $ab^{ct} = d$, where a, c, and d are real numbers and the base b is 2 or 10; evaluate the logarithm using technology to solve an exponential equation.

***Focus Standard 6- Factoring Polynomials** Proficiency Scale
Factor polynomials using common factoring techniques, and use the factored form of a polynomial to reveal the zeros of the function it defines.

***Focus Standard 16- Parent Functions and Transformations (Polynomial & Logs)** Proficiency Scale
Identify the effect on the graph of replacing f(x) by f(x) + k, k*f(x), f(k*x), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 20- Characteristics of Graphs** Proficiency Scale (a,e) Proficiency Scale (c)
Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Extend to polynomials, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

Standard 20a- Graph polynomial functions expressed symbolically, identifying zeros when suitable factorizations are available, and showing end behavior.
Standard 20e- Graph square root and cube root functions expressed symbolically.
Standard 20c- Graph logarithmic functions expressed symbolically, showing intercepts and end behavior.

***Focus Standard 20f- Characteristics of Graphs (Exponential & Logs)** Proficiency Scale
Compare the graphs of inverse functions and the relationships between their key features, including but not limited to quadratic, square root, exponential, and logarithmic.

Standard 12- Solving Equations (Exponential & Logs)
Solve simple equations involving exponential, radical, logarithmic, and trigonometric functions using inverse functions.

Standard 8- Explaining extraneous solutions
Explain why extraneous solutions to an equation may arise and how to check to be sure that a candidate solution satisfies an equation.

3rd Quarter

Trigonometric Functions

***Focus Standard 13- Two Variable Equations (Trig)** Proficiency Scale
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales and use them to make predictions. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 16- Parent Functions and Transformations (Trig)** Proficiency Scale
Identify the effect on the graph of replacing f(x) by f(x) + k, k*f(x), f(k*x), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 20b- Characteristics of Graphs** Proficiency Scale
Graph sine and cosine functions expressed symbolically, showing period, midline and amplitude.

***Focus Standard 34- Radian Definition** Proficiency Scale
Define the radian measure of an angle as the constant of proportionality of the length of an arc it intercepts to the radius of the circle; in particular, it is the length of the arc intercepted on the unit circle.

***Focus Standard 38- Law of Sines and Cosines** Proficiency Scale
Derive and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles. Extend the domain of sine and cosine to include right and obtuse angles.

Standard 35- Sine and Cosine
Choose trigonometric functions (sine and cosine) to model periodic phenomena with specified amplitude, frequency, and midline.

Standard 36- Pythagorean Identity
Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to calculate trigonometric ratios.

Standard 12- Solving Equations (Trig)
Solve simple equations involving exponential, radical, logarithmic, and trigonometric functions using inverse functions.

4th Quarter

Reciprocal Functions, Matrices, and Data Analysis

***Focus Standard 13- Two Variable Equations (Reciprocal)** Proficiency Scale
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales and use them to make predictions. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 16- Parent Functions and Transformations (Reciprocal)** Proficiency Scale
Identify the effect on the graph of replacing f(x) by f(x) + k, k*f(x), f(k*x), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Extend to polynomial, trigonometric (sine and cosine), logarithmic, reciprocal, radical, and general piecewise functions.

***Focus Standard 20d- Characteristics of Graphs** Proficiency Scale
Graph reciprocal functions expressed symbolically, identifying horizontal and vertical asymptotes.

***Focus Standard 33- Compare Treatments** Proficiency Scale
Use data from a randomized experiment to compare two treatments; limit to informal use of simulations to decide if an observed difference in the responses of the two treatment groups is unlikely to have occurred due to randomization alone, thus implying that the difference between the treatment groups is meaningful.

***Focus Standard 4- Matrix Operations** Proficiency Scale
Add, subtract, multiply matrices of appropriate dimensions.

Standard 25- Standard Deviation Proficiency Scale
From a normal distribution, use technology to find the mean and standard deviation and estimate population percentages by applying the empirical rule.

Standard 2- Manipulating Data
Use matrices to represent and manipulate data.

Standard 3- Scalar Multiplications
Multiply matrices by scalars to produce new matrices.

Standard 5- Determinants and Inverses
Describe the roles that zero and identity matrices play in matrix addition and multiplication, recognizing that they are similar to the roles of 0 and 1 in the real numbers.