



2023-2024 Jackson County Schools Algebra I w/ Probability Mathematics Pacing Guide

1st Quarter

Functions and Relations: Linear & Precise Functions

Standard 5 - Recognize Structure in Expressions [Proficiency Scale](#)

Use the structure of an expression to identify ways to rewrite it. Example: See $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.

Standard 15 - Domain and Range [Proficiency Scale](#)

Define a function as a mapping from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range.

Standard 15a - Use function notation, evaluate functions for inputs in their domains and interpret statements that use function notation in terms of a context.

Standard 12 - Two Variable Equations (Linear) [Proficiency Scale](#)

Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions.

Standard 21 - Function Representation (Piecewise) [Proficiency Scale](#)

Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Standard 23 - Graphical Transformations (Linear) [Proficiency Scale](#)

Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $k \cdot f(x)$, $f(k \cdot x)$, 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 explain the effects on the graph, using technology as appropriate.

2nd Quarter

Quadratic Functions

Standard 13- Systems of Equations and Inequalities [Proficiency Scale](#)

Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context.

Standard 20- Graphing Solutions to Linear Inequalities [Proficiency Scale](#)

Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes, using technology where appropriate.

Standard 6a - Factoring to Reveal Zeros

a. Factor quadratic expressions with leading coefficients of one, and use the factored form to reveal the zeros of the function it defines.

Standard 6b- Using the Vertex Form [Proficiency Scale \(6a,6b\)](#)

b. Use the vertex form of a quadratic expression to reveal the maximum or minimum value and the axis of symmetry of the function it defines; complete the square to find the vertex form of quadratics with a leading coefficient of one.

Standard 12 - Two Variable Equations (Quadratics) [Proficiency Scale](#)

Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions.

Standard 21- Properties of Functions (Quadratics) [Proficiency Scale](#)

Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Standard 23- Graphical Transformations (Quadratics) [Proficiency Scale](#)

Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $k \cdot f(x)$, $f(k \cdot x)$, 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 explain the effects on the graph, using technology as appropriate.

Standard 9- Solving Quadratic Equations

Select an appropriate method to solve a quadratic equation in one variable.

Standard 9a- 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. Explain how the quadratic formula is derived from this form.

[Proficiency Scale](#)

Standard 9b- Solve quadratic equations by inspection (such as $x^2 = 49$), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation, and recognize that some solutions may not be real.

3rd Quarter

Radical, Exponential, and Polynomial Functions

Standard 2- Properties of Exponents [Proficiency Scale](#)

Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Standard 6c-Expressions for Exponential Functions [Proficiency Scale](#)

Use the properties of exponents to transform expressions for exponential functions

Standard 7- Polynomial Expressions [Proficiency Scale](#)

Add, subtract, and multiply polynomials, showing that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication.

Standard 12- Two Variable Equations [Proficiency Scale](#)

Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions.

Standard 21 - Function Representation (Exponential) [Proficiency Scale](#)

Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).

Standard 23 - Graphical Transformations (Exponential) [Proficiency Scale](#)

Identify the effect on the graph of replacing $f(x)$ by $f(x)+k$, $k \cdot f(x)$, $f(k \cdot x)$, 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 explain the effects on the graph, using technology as appropriate.

4th Quarter

Probability and Statistics

Standard 35- Association between Categorical Variables [Proficiency Scale](#)

Analyze the possible association between two categorical variables.

Standard 35a- Summarize categorical data for two categories in two-way frequency tables and represent using segmented bar graphs.

Standard 35b- Interpret relative frequencies in the context of categorical data (including joint, marginal, and conditional relative frequencies).

Standard 35c- Identify possible associations and trends in categorical data.

Standard 36- Two-Way Tables [Proficiency Scale](#)

Generate a two-way categorical table in order to find and evaluate solutions to real-world problems.

Standard 36a- Aggregate data from several groups to find an overall association between two categorical variables.

Standard 36b- Recognize and explore situations where the association between two categorical variables is reversed when a third variable is considered (Simpson's Paradox)

Standard 38- Independence [Proficiency Scale](#)

Explain whether two events, A and B, are independent, using two-way tables or tree diagrams.

Standard 40- Describing Conditional Probability [Proficiency Scale](#)

Recognize and describe the concepts of conditional probability and independence in everyday situations and explain them using everyday language.