Mathematics Domains

Heart of Algebra Domain

- ► Create, solve, or interpret linear expressions or equations and linear inequalities in one variable that represent a context.
- ► Build a linear function that models a linear relationship between two quantities.
- ► Create, solve, and interpret systems of linear inequalities in two variables and systems of two linear equations in two variables.
- ► Solve linear equations or inequalities in one variable. The equation may yield no solution, one solution, or infinitely many solutions. Determine the value of a constant or coefficient for an equation with no solution or infinitely many solutions.
- ► Interpret the variables and constants in expressions for linear functions within the context presented.
- ► Select a graph described by a given linear equation, select a linear equation that describes a given graph, determine the equation of a line given a verbal description of its graph, determine key features of the graph of a linear function from its equation, or determine how a graph may be impacted by a change in its equation.

Problem Solving and Data Analysis Domain

- ► Use ratios, rates, proportional relationships, and scale drawings to solve single and multistep problems.
- ► Solve single and multistep problems involving percentages.
- ► Solve single and multistep problems involving measurement quantities, units, and unit conversion.
- ► Given a scatterplot, select the equation of a line or curve of best fit; interpret the line in the context of the situation; use the line or curve of best fit to make a prediction.
- ► Make connections between the graphical representation of a relationship and properties of the graph by selecting the graph that represents the properties described; using the graph to identify a value or set of values.
- ► Compare linear growth with exponential growth. Infer the connection between two variables given a context in order to determine what type of model fits best.
- ► Use two-way tables to summarize categorical data and relative frequencies, and calculate conditional probability.
- ► Make inferences about population parameters based on sample data.
- ► Use statistics to investigate measures of center of data and analyze shape, center, and spread.

- ► Evaluate reports to make inferences, justify conclusions, and determine appropriateness of data collection methods.

Passport to Advanced Math Domain

- ► Create a quadratic or exponential function or equation that models a context.
- ► Choose and produce equivalent forms of expressions to reveal and explain properties of a quantity.
- ► Create equivalent expressions involving radicals and rational exponents.
- ► Create an equivalent form of an algebraic expression by using structure and fluency with operations.
- ► Solve a quadratic equation having rational coefficients.
- ► Perform arithmetic operations on polynomials.
- ► Solve radical and rational equations in one variable, including examples where there are extraneous solutions.
- ► Solve a system of equations consisting of one linear and one quadratic equation in two variables.
- ► Add, subtract, multiply, or divide two rational expressions or divide two polynomial expressions and simplify the result.
- ► Interpret parts of nonlinear expressions in terms of their context.
- ► Understanding the relationship between zeros and factors of polynomials; use it to sketch graphs.
- ► Understand a nonlinear relationship between two variables by making connections between their algebraic and graphical representations.
- ► Use function notation to solve problems related to transformations and compositions of functions.
- ► Rearrange an equation or formula to isolate a single variable or a quantity of interest.

Additional Topics in Math Domain

- ► Solve problems using the volume formulas.
- ► Use trigonometric ratios and the Pythagorean Theorem to solve applied problems involving right triangles.
- ► Add, subtract, multiply, divide, and simplify complex numbers.
- ► Convert between degrees and radians and use radians to determine arc lengths; use trigonometric functions of radian measure.
- ► Apply theorems about circles to find arc lengths, angle measures, chord lengths, and areas of sectors.
- ► Use concepts and theorems about congruence and similarity to solve problems about lines, angles, and triangles.

- Use the relationship between similarity, right triangles, and trigonometric ratios; use the relationship between sine and cosine of complementary angles.
- Create an equation or use properties of an equation of a circle to demonstrate or determine a property of the circle's graph.