WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA ESSENTIALS

The Number System

I can compare values of irrational numbers.

I can label the approximate location of irrational numbers on a number line.

I can estimate the value of an irrational expression.

I can describe situations that have opposite quantities combining to make zero.

I can show p + q on a number line with |q| being the distance from p, in a positive or negative direction.

I can show that the sum of a number and its opposite is 0.

I can identify additive inverses.

I can place a number and its opposite value on a horizontal and vertical number line.

I can find sums of rational numbers in real-world contexts.

I can subtract rational numbers using additive inverses.

I can show that the distance between two points on a number line is the absolute value of their difference.

I can demonstrate using real-world examples that absolute value is always positive.

I can apply the associative property of addition using rational numbers.

I can apply the commutative property of addition using rational numbers.

I can apply the additive identity property using rational numbers.

I can apply the additive inverse property using rational numbers.

I can multiply rational numbers.

I can use the distributive property with rational numbers.

I can multiply signed numbers.

I can multiply rational numbers in real-world context.

I can divide positive and negative rational numbers with non-zero divisors.

I can interpret quotients of rational numbers by describing real-world contexts.

I can explain that a negative fraction must have either a negative numerator or negative denominator.

I can explain and apply the associative property of multiplication using rational numbers.

I can explain and apply the commutative property of multiplication using rational numbers.

I can explain and apply the multiplicative identity property using rational numbers.

I can explain and apply the multiplicative inverse property using rational numbers.

I can convert a rational number to a decimal (by hand) and explain that the decimal form of a rational number either terminates in zero or repeats.

I can recognize the difference between a repeating decimal and terminating decimal.

I can solve mathematical rational number problems.

I can solve real world rational number problems.

I can create mathematical rational number problems.

I can create real world rational number problems.

Algebra Essentials – First Marking Period

Expressions & Equations

I can convert between standard form and scientific notation.

I can compare numbers written in scientific notation.

I can use scientific notation to estimate very large or very small quantities.

I can simplify expressions where numbers are written in both decimal and scientific notation.

I can use scientific notation and choose appropriate units for very large and very small quantities.

I can interpret scientific notation that has been generated by technology.

Statistics & Probability

I can construct a scatter plot for data comparing two variables.

I can interpret the data from a scatter plot.

I can identify clustering and outliers from scatter plots for bivariate data.

I can identify positive or negative associations, linear associations, and nonlinear associations from bivariate data.

Geometry

I can explain why the Pythagorean Theorem is true.

I can explain why the converse of the Pythagorean Theorem is true.

I can apply the Pythagorean Theorem to find the missing side lengths in right triangles.

I can apply my knowledge of the Pythagorean Theorem to real-world situations involving right triangles.

I can calculate the distance between two points in a coordinate system using the Pythagorean Theorem.

Ratios and Proportional Relationships

Functions

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA ESSENTIALS

Ratios and Proportional Relationships

I can *find the unit rate given a ratio of fractions in a variety of real-world situations.*

I can *accurately identify unit rates.*

I can *identify that two quantities are in a proportional relationship.*

I can *use a table to determine if two quantities are in a proportional relationship.*

I can *recognize that two quantities are proportional if their ordered pairs form a straight line through the origin.*

I can *determine the constant of proportionality (rate of change) given a table.*

I can *determine the constant of proportionality (rate of change) given a graph.*

I can *determine the constant of proportionality (rate of change) given a diagram.*

I can *identify the constant of proportionality (rate of change) given an equation.*

I can *determine the constant of proportionality (rate of change) given a verbal description.*

I can *translate a real world situation into an equation to demonstrate proportionality.*

I can *create a table to demonstrate proportionality.*

I can *identify the unit rate as the y-coordinate when the x-coordinate is one (1) when given a graph.*

I can *identify the unit rate as the y-coordinate when the x-coordinate is one (1) when given a table.*

I can *convert a percent into a proportional relationship out of 100.*

I can *convert a percent to a fraction or decimal when used in calculations.*

I can *convert between fractions, decimals and percents.*

I can *solve real-world multi-step ratio and percent problems.*

Geometry

I can *use a scale factor (ratios) to determine the coordinates of a dilated figure.*

I can *use coordinates to describe the effects of translation, rotation, and reflections on two-dimensional figures.*

I can *use two similar two-dimensional figures to find the scale factor between them.*

I can *describe the sequence of rotations, reflections, translations, or dilations that exhibits the similarity between two-dimensional figures using words and/or symbols.*

I can *use proportions to find unknown lengths of geometric figures.*

I can *use scale drawings to find areas of geometric figures.*

I can *reproduce a scale drawing at a different scale.*

Algebra Essentials – Second Marking Period

Expressions & Equations

I can identify the properties of exponents.

I can apply the properties of integer exponents to produce equivalent numerical expressions.

I can identify small perfect squares and cubes.

I can identify small square roots and cube roots.

I can use small perfect square and cube roots symbols to represent solutions to equations.

I can apply the distributive property to linear expressions with rational coefficients.

I can identify and combine like terms utilizing commutative and associative properties for addition to linear expressions with rational coefficients.

I can expand linear expressions with rational coefficients using the properties of operations.

I can identify a common factor to find an equivalent linear expression with rational coefficients.

I can rewrite an expression in an equivalent form in order to see how quantities are related in a problem context.

I can solve multi-step word problems with positive and negative rational numbers using tools strategically.

I can solve multi-step real-world problems with positive and negative rational numbers.

I can use properties of operations to calculate with numbers in any form (decimal, fraction, and integer).

I can determine if my answers are reasonable using mental math and estimation.

I can convert between forms of rational numbers as appropriate to solve multi-step problems.

The Number System

Statistics & Probability

Functions

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA ESSENTIALS

Geometry

I can use a formula to find the sum of the interior angles of a triangle.

I can use a formula to find the measurements of the interior angles of a triangle.

I can determine the measurements of the angles formed by parallel lines that are cut by a transversal (corresponding angles, interior angles, alternate interior angles, alternate exterior angles, interior angles on same side of the transversal).

I can use a formula to determine the measure of an exterior angle of a triangle.

I can recall the formulas for volumes of cones, cylinders, and spheres.

I can determine and apply the appropriate formulas in order to solve real-world problems for cones, cylinders, and spheres.

I can use equation-solving steps to find the volume of cones, cylinders and spheres in real-world and mathematical volume problems.

I can identify the formulas for circumference and area of a circle.

I can find the area and circumference of a circle using the appropriate formula.

I can find the circumference of circle or the area of a circle given the other value.

I can show that π can be derived from the circumference and diameter of a circle.

I can determine unknown angles' measures by using multi-step equations based on angle pairs.

I can write and solve an equation involving angle pair measures.

I can substitute into formulas and solve for unknown quantities.

I can find the area of triangles, quadrilaterals, and other polygons using formulas that are in real-world or mathematical problems.

I can find the volume of cubes and right prisms that are in real-world or mathematical problems.

I can find the surface area of cubes and right prisms that are in real world or mathematical problems.

Algebra Essentials – Third Marking Period

Expressions & Equations

I can graph proportional relationships. (y = kx)

I can determine the unit rate as the slope of the graph of a proportional relationship.

I can compare two different proportional relationships represented as graphs, tables, etc.

I can use similar triangles to explain why the slope of a line is the same all along the line.

I can find an equation (y=mx) for a line through the origin.

I can find an equation (y=mx+b) for a line intercepting the y-axis (vertical axis) at point (0, b).

I can give examples of equations with one variable with one solution.

I can give examples of equations with infinitely many solutions.

I can give examples of equations with no solutions.

I can find the number of solutions to an equation by simplifying the equation until an equivalent equation of the form x = a, a=a, or a=b results.

I can solve linear equations with rational coefficients.

I can solve linear equations with rational coefficients that require the use of the distributive property.

The Number System

Statistics & Probability

Functions

Ratios and Proportional Relationships

WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA ESSENTIALS

Expressions & Equations – Creating Equations

I can recognize that the solution to a system of linear equations is their point of intersection.

I can use the point of intersection of two linear equations to solve the equations simultaneously.

I can solve systems of two linear equations in two variables algebraically.

I can estimate the solution to a system of two linear equations in two variables by graphing the equations.

I can use technology to determine the solution to a system of two linear equations in two variables.

I can apply my knowledge of equations to create a system of two linear equations in two variables in real-world problems.

I can apply my knowledge of equations to create a system of two linear equations in two variables in mathematical problems.

I can solve multi-step equations using rational numbers.

I can create multi-step equations from real-world situations using rational numbers.

I can solve multi-step equations using rational numbers fluently.

I can compare an algebraic solution to an arithmetic solution.

I can solve multi-step inequalities using rational numbers.

I can create multi-step inequalities from real-world situations using rational numbers.

I can graph the solution set of an inequality using rational numbers.

I can interpret the solution of the problem involving inequalities by using its graph.

I can create linear equations in one variable to solve problems.

I can create linear inequalities in one variable to solve problems.

I can create equations in two or more variables to solve problems showing the relationship between the quantities.

I can graph equations on coordinate axes with correct labels and scales.

I can represent reasonable limits by equations and inequalities based on the context of a problem.

I can interpret solutions as reasonable or not possible based on the context of a problem.

I can rearrange a formula to correctly solve for a variable.

Algebra Essentials – Fourth Marking Period

Functions

I can define a function as a rule that has exactly one output for each input.

I can define a graph of a function as the set of ordered pairs created by an input and its corresponding output.

I can compare the properties of two functions algebraically.

I can compare the properties of two functions in a table.

I can compare the properties of two functions by verbal descriptions.

I can compare the properties of two functions in a graph.

I can give examples of non-linear functions.

I can identify a linear function by an equation in slope-intercept form (y = mx +b).

I can identify a linear function by the graph of the function.

I can determine the initial value of a function from a description of the relationship.

I can determine the rate of change of a function from a description of the relationship.

I can construct a function that models a linear relationship between two quantities.

I can determine the rate of change of a function from two (x,y) values found in a table.

I can determine the rate of change of a function from two (x,y) values found on a graph.

I can determine the initial value of a function from two (x,y) values found in a table.

I can determine the initial value of a function from two (x,y) values found on a graph.

I can interpret the rate of change and initial value of a linear function from a situation it models

I can sketch a graph that shows the number features of a function that has been described verbally.

I can describe the functional relationship between two quantities by analyzing its graph.

Statistics & Probability

I can identify from a model relationship between two data sets a pattern showing a straight line.

I can construct a line of best fit to represent the data in a scatter plot suggesting a linear association.

I can interpret the meaning of the slope and intercept of a linear equation in terms of the situation.

I can solve problems using the equation of a linear model.

I can interpret the data in the two-way table to recognize patterns.

I can construct a two-way table from data to determine a relationship between the variables.

I can use relative frequencies of the data to describe relationships (positive, negative, or no correlation).

The Number System

Geometry

Ratios and Proportional Relationships