

## WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA I

### Number and Quantity

- I can add or multiply any rational numbers and get a rational answer.*
- I can show that adding any rational and irrational number will be irrational.*
- I can show that multiplying any rational and irrational number will be irrational.*
- I can interpret and use the correct units when solving a problem.*
- I can interpret and use a correct scale when graphing.*
- I can interpret and use a correct scale when displaying data.*
- I can use the correct quantities when modeling a problem.*
- I can determine an appropriate level of accuracy to assign to a quantity.*

### Algebra

- I can identify separate terms in an expression.*
- I can identify the factors in an expression.*
- I can identify the coefficients in an expression.*
- I can split up a complicated problem into smaller expressions.*
- I can combine smaller parts into a more complicated expression.*
- 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.*
- I can graph equations on coordinate axes with correct labels and scales.*
- I can demonstrate the correct steps used to solve a simple problem.*
- I can demonstrate why the steps taken to solve a problem are correct.*
- I can demonstrate that a graph of any equation in two variables is the set of all of its solutions.*

### Statistics & Probability

Continued. . .

## Algebra I – First Marking Period



### Functions

*I can demonstrate that a function must have exactly one y-value for every x -value.*

*I can show that x-values are the domain and the y-values are the range.*

*I can show that the x-values are the input and the y-values are the output.*

*I can show that y is the same as  $f(x)$ .*

*I can evaluate a function using different inputs (x-values).*

*I can interpret statements that use function notation.*

*I can interpret key features of graphs from their tables.*

*I can sketch a graph from a table that shows its key features.*

*I can sketch a graph from a verbal description of the relationship of the points.*

*I can determine an appropriate domain of a function based on the relationship it describes.*

*I can interpret and calculate the average rate of change of a function from a table.*

*I can interpret and calculate the average rate of change of a function from a graph.*

*I can estimate the rate of change from a graph.*

*I can graph linear functions showing key features by hand.*

*I can graph linear functions showing key features using technology.*

*I can compare two functions that are represented in different ways and identify key features.*

*I can determine an explicit expression from a context.*

*I can determine a recursive process from a context.*

*I can determine the steps needed to solve a problem from a context.*

*I can determine how changes to an original function will change the graph of the functions.*

*I can identify what factor affects the shape of the graph of a function.*

*I can use technology to show how changes to an original function change the shape of a graph.*

*I can prove that linear functions grow by adding or subtracting a constant rate of change.*

*I can recognize when a quantity changes by a constant rate of change.*

*I can write a linear function from a graph.*

*I can write a linear function from a description.*

*I can write a linear function from two points.*

*I can determine a linear relationship in a real life context.*

## WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA I

### Number and Quantity

- I can convert rational exponents into radical notation.*
- I can use the rules of exponents even when the exponents are rational.*
- I can use the correct quantities when modeling a problem.*
- I can determine an appropriate level of accuracy to assign to a quantity.*

### Algebra

- I can identify separate terms in an expression.*
- I can identify the factors in an expression.*
- I can identify the coefficients in an expression.*
- I can split up a complicated problem into smaller expressions.*
- I can combine smaller parts into a more complicated expression.*
- I can interpret and correctly rewrite an expression based on its structure.*
- I can rewrite a complicated expression into smaller parts to simplify it in easier ways.*
- I can use the properties of exponents to rewrite exponential functions.*
- I can create rational and exponential function to solve problems.*
- I can rearrange a formula to correctly solve for a variable.*
- I can demonstrate the correct steps used to solve a simple problem.*
- I can demonstrate why the steps taken to solve a problem are correct.*
- I can solve linear equations in one variable including equations with coefficients that are letters.*
- I can solve inequalities in one variable.*
- I can add two equations in two variables to solve a system.*
- I can multiply one or both equations in two variables in order to solve a system.*
- I can solve systems of two equations in two variables using a graph.*
- I can solve systems of two equations, one linear and one quadratic, in two variables using a graph.*
- I can solve a simple system of two equations, one linear and one quadratic, in two variables algebraically.*
- I can demonstrate that a graph of any equation in two variables is the set of all of its solutions.*
- I can explain why the x-coordinates where two graphs meet are the result of setting the two equations equal to each other.*
- I can make tables of two equations to approximate the intersection points.*
- I can make tables of two equations to approximate the intersection points.*
- I can graph a linear inequality in two variables as a half-plane of solution points.*
- I can graph two linear inequalities in two variables as two half-planes that intersect where all points are the solutions for both inequalities.*

Continued. . .

## Algebra I – Second Marking Period



### Functions

*I can identify sequences as functions.*

*I can recognize sequences that are recursive.*

*I can interpret key features of graphs from their tables.*

*I can sketch a graph from a table that shows its key features.*

*I can sketch a graph from a verbal description of the relationship of the points.*

*I can determine an appropriate domain of a function based on the relationship it describes.*

*I can interpret and calculate the average rate of change of a function from a table.*

*I can interpret and calculate the average rate of change of a function from a graph.*

*I can estimate the rate of change from a graph.*

*I can graph a square root function.*

*I can graph a piecewise function.*

*I can graph an absolute value function.*

*I can use the properties of exponents in exponential functions to determine growth or decay.*

*I can compare two functions that are represented in different ways and identify key features.*

*I can write arithmetic sequences recursively to model situations.*

*I can write geometric sequences explicitly to model situations.*

*I can show how explicit formulas can be written as recursive formulas and vice versa.*

*I can prove that exponential functions grow by a multiplying by a constant factor.*

*I can recognize when a quantity grows at a constant percent rate of change.*

*I can recognize when a quantity decays at a constant percent rate of change.*

*I can write an exponential function from a graph.*

*I can write an exponential function from a description.*

*I can write an exponential function from a table.*

*I can show how an exponential function will increase faster than a linear function.*

*I can show how an exponential function will increase faster than a quadratic function.*

*I can show how an exponential function will increase faster than any polynomial function.*

*I can determine an exponential function in a real-life context.*

### Statistics and Probability

## WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA I

### Number and Quantity

*I can identify a complex number as a number of the form  $a + bi$ .*

*I can define  $i$  as a complex number such that  $i^2 = -1$ .*

*I can solve quadratic equations with real coefficients that have complex number solutions.*

### Functions

*I can show that  $y$  is the same as  $f(x)$ .*

*I can evaluate a function using different inputs ( $x$ -values).*

*I can interpret statements that use function notation.*

*I can interpret key features of graphs from their tables.*

*I can sketch a graph from a table that shows its key features.*

*I can sketch a graph from a verbal description of the relationship of the points.*

*I can determine an appropriate domain of a function based on the relationship it describes.*

*I can graph quadratic functions showing key features by hand.*

*I can graph quadratic functions showing key features using technology.*

*I can graph a cube root function.*

*I can graph a polynomial function.*

*I can identify the zeros of a polynomial function using factoring when possible.*

*I can describe the end behaviors of a function.*

*I can factor a quadratic to find zeros.*

*I can complete the square to find zeros.*

*I can show the extreme values of a function.*

*I can identify the symmetry of a graph.*

*I can compare two functions that are represented in different ways and identify key features.*

*I can determine an explicit expression from a context.*

*I can determine a recursive process from a context.*

*I can determine the steps needed to solve a problem from a context.*

*I can combine standard functions using arithmetic operations.*

*I can determine how changes to an original function will change the graph of the functions.*

*I can identify what factor affects the shape of the graph of a function.*

*I can use technology to show how changes to an original function change the shape of a graph.*

*I can determine a quadratic relationship in a real-life context.*

Continued. . .



## Algebra I – Third Marking Period

### Algebra

- I can split up a complicated problem into smaller expressions.*
- I can combine smaller parts into a more complicated expression.*
- I can interpret and correctly rewrite an expression based on its structure.*
- I can rewrite a complicated expression into smaller parts to simplify it in easier ways.*
- I can factor a quadratic to find its zeros.*
- I can complete the square in a quadratic to find the maximum value of the function.*
- I can complete the square in a quadratic to find the minimum value of the function.*
- I can use the rules for integers to add polynomials.*
- I can use the rules for integers to subtract polynomials.*
- I can use the rules for integers to multiply polynomials.*
- I can create quadratic equations in one variable to solve problems.*
- I can create rational and exponential function to solve problems.*
- I can create quadratic inequalities in one variable to solve problems.*
- 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 demonstrate the correct steps used to solve a simple problem.*
- I can demonstrate why the steps taken to solve a problem are correct.*
- I can complete the square to transform any quadratic in  $x$  into a squared binomial.*
- I can show how to derive the quadratic formula from a squared binomial.*
- I can solve a quadratic by taking square roots.*
- I can solve a quadratic by completing the square.*
- I can solve a quadratic by using the quadratic formula.*
- I can solve a quadratic by factoring.*
- I can see when the quadratic formula will give a complex number solution and write it as  $a + bi$ .*
- I can solve systems of two equations in two variables using a graph.*
- I can solve systems of two equations, one linear and one quadratic, in two variables using a graph.*
- I can solve a simple system of two equations, one linear and one quadratic, in two variables algebraically.*
- I can demonstrate that a graph of any equation in two variables is the set of all of its solutions.*
- I can explain why the  $x$ -coordinates where two graphs meet are the result of setting the two equations equal to each other.*
- I can make tables of two equations to approximate the intersection points.*
- I can graph two equations to approximate the intersection points.*

### Statistics & Probability

## WHAT STUDENTS NEED TO KNOW AND BE ABLE TO DO IN ALGEBRA I

### Algebra

- I can use the rules for integers to add polynomials.*
- I can use the rules for integers to subtract polynomials.*
- I can use the rules for integers to multiply polynomials.*
- I can identify the zeros of a polynomial by correctly factoring when possible.*
- I can construct a rough graph from the zeros of the polynomial.*
- I can expand a polynomial using the Binomial Theorem.*
- I can use Pascal's Triangle to find the value of the combinations in each term in the Binomial Theorem.*
- 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 demonstrate the correct steps used to solve a simple problem.*
- I can demonstrate why the steps taken to solve a problem are correct.*
- I can demonstrate that a graph of any equation in two variables is the set of all of its solutions.*

### Functions

- I can show that  $y$  is the same as  $f(x)$ .*
- I can evaluate a function using different inputs ( $x$ -values).*
- I can interpret statements that use function notation.*
- I can graph a polynomial function.*
- I can identify the zeros of a polynomial function using factoring when possible.*
- I can describe the end behaviors of a function.*
- I can combine standard functions using arithmetic operations.*

### Statistics & Probability

- I can make a dot plot on the real number line.*
- I can construct a histogram on the real number line.*
- I can construct a box plot on a real number line.*
- I can compare the central tendencies of two or more sets of data.*
- I can compare the interquartile range of two or more sets of data.*
- I can compare the standard deviation of two or more sets of data.*
- I can interpret the differences in the shape (skewness) of different data sets.*
- I can interpret the differences in the central tendencies of different data sets.*
- I can interpret the differences in the spreads of different data sets.*
- I can interpret how an outlier would affect the shape of a normal curve distribution.*
- I can interpret how an outlier would affect the spread of a data set.*

### Numbers and Quantity