2021 - 2022, HS, Algebra I

The following Practice Standards and Literacy Skills will be used throughout the course:

Standards for Mathematical Practice	***Literacy Skills for Mathematical Proficiency***
1. Make sense of problems and persevere in solving them.	*1. Use multiple reading strategies.*
2. Reason abstractly and quantitatively.	*2. Understand and use correct mathematical vocabulary.*
3. Construct viable arguments and critique the reasoning of others.	*3. Discuss and articulate mathematical ideas.*
4. Model with mathematics. ★	*4. Write mathematical arguments.*
5. Use appropriate tools strategically.	
6. Attend to precision.	
7. Look for and make use of structure.	
8. Look for and express regularity in repeated reasoning.	

Quarter 1

Standards	Evidence of Learning Statements from Instructional Focus Document
A1.A.REI.A.1 Explain each step in solving an equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. *Scope and Clarifications:* *Tasks are limited to linear, quadratic, and absolute value equations with integer exponents.*	Solve linear, ~~quadratic~~, ~~and absolute value~~ equations using multiple solution strategies and explain each step in the solution path. Construct a viable argument to justify a chosen solution path used to solve a linear, ~~quadratic, and absolute value~~ equation. Compare the steps in each and determine which solution path is most efficient, given an equation with multiple solution paths. Explain when an equation has no solution or infinitely many solutions.

Standards	Evidence of Learning Statements from Instructional Focus Document
A1.N.Q.A.1★ Use units as a way to understand problems and to guide the solution of multi- step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Use units to understand problems and to guide the solution path for a multi-step problem. Choose and interpret units appropriately when solving a multistep problem, including problems that contain real-world formulas. Recognize the relationship between the units for all variables in a formula. Choose and interpret the scale and the origin in graphs and data displays. Determine the most appropriate data display based on the units given in a problem.
A1.N.Q.A.2 ★Identify, Interpret, and justify appropriate quantities for the purpose of descriptive modeling. *Scope and Clarifications:* *Descriptive modeling refers to understanding and interpreting graphs; identifying extraneous information; choosing appropriate units; etc.*	Identify and interpret necessary information in order to select or create a quantity that models a real-world problem. Explain the meaning of individual quantities in the context of the real-world problem. Attend to precision when defining quantities and their units embedded in context. Explain and justify the relationship between solutions to contextual problems and the values used to compute the solutions. Appropriately interpret, explain the meaning of, and draw conclusions about the quantities in real-world problems. Make observations about quantities given a graph or model. Explain why information is extraneous in a real-world problem.
A1.N.Q.A.3 ★Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	Report a quantity with precision and accuracy.

Standards	Evidence of Learning Statements from Instructional Focus Document
	Choose an appropriate level of accuracy that reflects the limitations on measurement. Explain the reasonableness of answers with respect to the context of the problem when reporting quantities as a result of solving the contextual problem. Describe the most common causes of inaccuracies in contextual problems (e.g., when using measurement tools).
A1.A.SSE.A.1 ★ Interpret expressions that represent a quantity in terms of its context. **a.** Interpret parts of an expression, such as terms, factors, and coefficients. *Scope and Clarifications:* *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.*	Interpret parts of an expression (i.e. term, factor, coefficient) embedded in a real-world situation and explain each part in terms of the context. Interpret parts of an expression (i.e. term, factor, and coefficient) and explain each part in terms of the function the expression defines. Explain the structure of an expression and how each term is related to the other terms by interpreting the arithmetic meaning of each term in the expression and recognizing when combining like terms is appropriate. Interpret an expression by describing each individual term as a single entity and the relationship to the expression.
A1.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. *Scope and Clarifications:* *Tasks are limited to linear, quadratic, or exponential equations with integer exponents.*	Create and solve a one variable linear, ~~quadratic, or exponential~~ equation that represents a real-world situation. Create and solve a one-variable linear inequality that represents a real-world situation. ~~Create and solve a one-variable quadratic or exponential inequality that represents a simple real-world situation.~~
A1.A.REI.B.2 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	Solve linear equations in one variable with coefficients represented by letters. Solve multi-step linear equations.

Standards	Evidence of Learning Statements from Instructional Focus Document
	Solve multi-step linear inequalities in one variable.
A1.A.CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *Scope and Clarifications:* *i) Tasks are limited to linear, quadratic, and exponential equations with integer exponents.* *ii) Tasks have a real-world context.*	Rearrange real-world quadratic formulas to highlight a quantity of interest. Rearrange real-world exponential formulas to highlight a quantity of interest.
A1.A.CED.A.3 Represent constraints by equations or inequalities, ~~and by systems of equations and/or inequalities~~, and interpret solutions as viable or nonviable options in a modeling context. *Scope and Clarifications:* *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	Write an equation or inequality that models the constraint on a variable given a contextual problem. Explain constraints on a variable in context of a real-world problem and interpret solutions to determine the viability by using a graph, table, and equation. Justify solutions that model real-world problems when there are limitations on a variable. Interpret solutions as viable or nonviable options in a modeling context using multiple representations (i.e. table, graph, equation).
A1.F.IF.B.3 ★For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Scope and Clarifications:* *Key features include intercepts, intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.*	Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with domain in the integers. Identify all evident key features when provided a table of values representing a linear, quadratic, or absolute value equation. Identify key features of the graph or table and interpret the meaning of the key features in relationship to the context of the problem, given a graph or table of values representing a quadratic function embedded in a real-world context.

Standards	Evidence of Learning Statements from Instructional Focus Document
	identify key features of the graph or table and interpret the meaning of the key features in relationship to the context of the problem, given a graph or table of values representing an absolute value function embedded in a real-world context. Identify key features of the graph and interpret the meaning of the key features in relation to the context of the problem, given a graph of an exponential function with domain in the integers embedded in a real-world context. Sketch a graph of the function, given a verbal description of the key features of a quadratic or absolute value function.
A1.F.IF.A.1 Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(x) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation *y* = *f*(x).	Create an example of a function using a set of ordered pairs, a graph, and a table of values to show the correspondence between one input value (domain) and one output value (range). Explain the meaning of a function using correct mathematical vocabulary.
A1.F.IF.A.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Given a function that represents a real-world problem, determine what each variable represents. Given a function that represents a real-world problem, interpret the meaning of output values when given input values and vice versa. Use multiple representations to model a function in a real-world situation.
A1.F.IF.B.4 ★Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *Scope and Clarifications:* *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*	Explain how the domain relates to the graph of a function. Explain why a function is continuous or discrete given an equation. Describe how a function's domain is affected when situated within a context. Explain if a function is continuous or discrete, given a context.

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Standards	Evidence of Learning Statements from Instructional Focus Document
A1.F.LE.A.2★ Construct linear ~~and exponential~~ functions, including arithmetic ~~and geometric~~ sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table.) *Scope and Clarifications:* *Tasks are limited to constructing linear and exponential functions in simple context (not multi-step).*	Construct a linear function given a graph. Construct a linear function given a table of values. Construct a linear function given a description of a simple real-world relationship. Construct a linear function given a set of input-output pairs (ordered pairs). Construct a linear ~~or exponential function~~ given an arithmetic ~~or geometric sequence~~ or a description of one.
A1.F.BF.A.1★Write a function that describes a relationship between two quantities. **a.** Determine an explicit expression, a recursive process, or steps for calculation from a context. *Scope and Clarifications:* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, quadratic functions, and exponential functions with domains in the integers.*	Write a function defined by an expression to model a linear relationship, given a real-world context. ~~Write a function defined by an expression to model a quadratic relationship, given a real-world context.~~ ~~Write a function defined by an expression to model an exponential relationship with domain in the integers, given a real-world context.~~ Compare key characteristics of real-world contexts that can be described by various types of functions.

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Standards	Evidence of Learning Statements from Instructional Focus Document
A1.F.LE.A.1 ★Distinguish between situations that can be modeled with linear functions and with exponential functions. **a**. Recognize that linear functions grow by equal differences over equal intervals, ~~and that exponential functions grow by equal factors over equal intervals.~~ **b.** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. **c.** ~~Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.~~	Recognize that linear functions have a constant rate of change, while exponential functions do not. Informally show or explain that linear functions grow by adding the same number per unit. This should be done algebraically, graphically, and using words in context of a real-world application. Determine if a given real-world situation has a constant rate of change and can be modeled by a linear function.
A1.F.LE.B.4 ★Interpret the parameters in a linear ~~or exponential~~ function in terms of a context. *Scope and Clarifications:* *For example, the total cost of an electrician who charges 35 dollars for a house call and 50 dollars per hour would be expressed as the function y = 50x + 35. If the rate were raised to 65 dollars per hour, describe how the function would change.* *i) Tasks have a real-world context.*	Explain the meaning of the slope and y-intercept in context of the real-world situation, given a linear function. Predict and determine how a linear function is affected by a change in the slope or y-intercept. Explain this change in context.
A1.F.IF.C.6 Graph functions expressed symbolically and show key features of the graph, by hand and using technology. **a.** Graph linear ~~and quadratic~~ functions and show intercepts, ~~maxima, and minima~~.	Graph a linear function by hand and using technology and identify the slope and intercepts. Attend to precision when illustrating intercepts, ~~maxima, and minima~~ and determine the domain and range of the function.
A1.A.REI.D.5 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	Find a set of solutions that can be used to create the graph, given an equation.

Standards	Evidence of Learning Statements from Instructional Focus Document
	Interpret the graph of an equation as the solution set to the equation with two variables. Explain why the points on a curve (or line) would be continuous. Explain the relationship between the graphical representation and the solutions (ordered pairs) to the equation, given a real-world situation.
A1.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.	Create and graph a two-variable linear, ~~quadratic, exponential, absolute value, step, or piecewise~~ equation that represents a mathematical situation.
A1.F.BF.B.2 Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x), f(kx)*, 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. *Scope and Clarifications:* *i) Identifying the effect on the graph of replacing f(x) by f(x) + k, k f(x), and f(x+k) for specific values of k (both positive and negative) is limited to linear, quadratic, and absolute value functions.* *ii) f(kx) will not be included in Algebra 1. It is addressed in Algebra 2.* *iii) Experimenting with cases and illustrating an explanation of the effects on the graph using technology is limited to linear functions, quadratic functions, absolute value, and exponential functions with domains in the integers.* *iv) Tasks do not involve recognizing even and odd functions.*	Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$. Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $k(x)$. Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$. Determine the value of k for a specific vertical or horizontal translation or vertical stretch or compression, given two graphs, the image and pre-image. Describe multiple effects on a graph for specific values of a, h, and k given two functions, $f(x)$ and $a(x + h) + k$.
A1.F.IF.B.4 ★Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *Scope and Clarifications:*	Explain how the domain relates to the graph of a function. Explain why a function is continuous or discrete given an equation.

Standards	Evidence of Learning Statements from Instructional Focus Document
For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.	Describe how a function's domain is affected when situated within a context. Explain if a function is continuous or discrete, given a context.
A1.F.IF.C.8 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *Scope and Clarifications:* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, ~~quadratic functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.~~*	Compare properties of two exponential functions each represented in a different way. Compare properties of two piecewise-defined functions each represented in a different way. Compare properties of two quadratic functions each represented in a different way. Compare properties of two functions from different function families each represented in a different way.
A1.S.ID.C.5 Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	Interpret the slope of a linear model in the context of the data. Interpret the y-intercept of a linear model in the context of the data.
A1.A.CED.A.3 Represent constraints by equations or inequalities, ~~and by systems of equations and/or inequalities~~, and interpret solutions as viable or nonviable options in a modeling context. *Scope and Clarifications:* *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	Write an equation or inequality that models the constraint on a variable given a contextual problem. Explain constraints on a variable in context of a real-world problem and interpret solutions to determine the viability by using a graph, table, and equation. Justify solutions that model real-world problems when there are limitations on a variable. Interpret solutions as viable or nonviable options in a modeling context using multiple representations (i.e. table, graph, equation).
A1.N.Q.A.1 Use units as a way to understand problems and to guide the solution of multi- step problems; choose and interpret units consistently in	Use units to understand problems and to guide the solution path for a multi-step problem.

Standards	Evidence of Learning Statements from Instructional Focus Document
formulas; choose and interpret the scale and the origin in graphs and data displays.	Choose and interpret units appropriately when solving a multistep problem, including problems that contain real-world formulas. Recognize the relationship between the units for all variables in a formula. Choose and interpret the scale and the origin in graphs and data displays. Determine the most appropriate data display based on the units given in a problem.
A1.A.REI.D.6 ★Explain why the x-coordinates of the points where the graphs of the equations *y = f(x)* and *y = g(x)* intersect are the solutions of the equation *f(x) = g(x)*; find the approximate solutions using technology. *Scope and Clarifications:* *Include cases where f(x) and/or g(x) are linear, quadratic, absolute value, and exponential functions. For example, f(x) = 3x + 5 and* $g(x) = x^2 + 1$*. Exponential functions are limited to domains in the integers.*	Approximate the solution(s) for f(x) = g(x) using technology when f(x) and g(x) are linear, quadratic, absolute value or exponential, given two equations f(x) and g(x) embedded in a real-world situation. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x).
A1.A.REI.D.7 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.~~	Graph the solutions to a linear inequality in two variables as a half-plane.
A1.WCE.1 Classify graphs and equations into the appropriate function families, limited to linear, quadratic, absolute value, square root, cube root, exponential, and cubic. **A1.F.IF.C.8** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *Scope and Clarifications:* *i) Tasks have a real-world context.*	Classify graphs and equations into the appropriate function families, limited to linear, quadratic, absolute value, square root, cube root, exponential, and cubic. Compare properties of two exponential functions each represented in a different way. Compare properties of two piecewise-defined functions each represented in a different way.

Standards	Evidence of Learning Statements from Instructional Focus Document
ii) Tasks are limited to linear functions, quadratic functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.	Compare properties of two quadratic functions each represented in a different way. Compare properties of two functions from different function families each represented in a different way.

Quarter 2

Standards	Evidence of Learning Statements from Instructional Focus Document
A1.S.ID.A.1 Represent single or multiple data sets with dot plots, histograms, stem plots (stem and leaf), and box plots.	Create parallel or side-by-side box plots or histograms with the same scale. Determine which type of data plot would be most appropriate for a set of data. Use real-world data (represented in a table) to create dot plots, histograms, stem plots, or box plots. Use technology to represent single or multiple data sets with dot plots, histograms, stem plots (stem and leaf), and box plots.
A1.S.ID.A.2 Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	Explain similarities and differences using specific measures of central tendency and measures of dispersion, given two or more data sets. Determine within how many standard deviations above or below the mean a data value is.
A1.S.ID.A.3 Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	Choose which measure(s) are most appropriate for comparison based on the shape of the distribution. Describe the impact of an outlier on the center and spread of a data set.
A1.N.Q.A.1★ Use units as a way to understand problems and to guide the solution of multi- step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	Use units to understand problems and to guide the solution path for a multi-step problem. Choose and interpret units appropriately when solving a multistep problem, including problems that contain real-world formulas. Recognize the relationship between the units for all variables in a formula. Choose and interpret the scale and the origin in graphs and data displays.

Standards	Evidence of Learning Statements from Instructional Focus Document
	Determine the most appropriate data display based on the units given in a problem.
A1.S.ID.B.4 Represent data on two quantitative variables on a scatter plot and describe how the variables are related. **a.** Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. **b.** Fit a linear function for a scatter plot that suggests a linear association.	Fit an exponential function to a given set of data, where exponential functions are limited to domains in the integers. Solve problems using a linear or exponential function in the context of the data, where exponential functions are limited to domains in the integers. Describe the similarities and differences between their chosen line of best fit and the line of best fit created using technology, given a scatter plot.
A1.S.ID.C.6 Use technology to compute and interpret the correlation coefficient of a linear fit.	Using technology to calculate the correlation coefficient of a linear fit in mathematical problems. Interpret the correlation coefficient of a linear fit in mathematical problems.
A1.S.ID.C.7 Distinguish between correlation and causation.	Explain why a strong correlation does not imply causation. Distinguish variables that are correlated because one is a cause of another and justify their reasoning.
A1.A.REI.C.4 Write and solve a system of linear equations in context. *Scope and Clarifications:* *Solve systems both algebraically and graphically.* *Systems are limited to at most two equations in two variables.*	Solve a system of linear equations in two variables algebraically using the substitution method. Solve a system of linear equations in two variables algebraically using the elimination method. Write a system of linear equations in two variables given a real-world context. Interpret the solution of a system of linear equations in two variables in relationship to a context. Justify why a system of linear equations in two variables may have one solution, no solutions, or infinitely many solutions.

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Standards	Evidence of Learning Statements from Instructional Focus Document
A1.A.CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. *Scope and Clarifications:* *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	Write an equation or inequality that models the constraint on a variable given a contextual problem. Write a system of equations or inequalities that models the constraint on a variable given a contextual problem. Explain constraints on a variable in context of a real-world problem and interpret solutions to determine the viability by using a graph, table, and equation. Justify solutions that model real-world problems when there are limitations on a variable. Interpret solutions as viable or nonviable options in a modeling context using multiple representations (i.e. table, graph, equation).
A1.A.REI.D.7 ~~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.	Graph the solution set to a system of two linear inequalities in two variables as the intersection of the corresponding half-planes
A1.F.IF.C.6 Graph functions expressed symbolically and show key features of the graph, by hand and using technology. **b.** Graph ~~square root, cube root, and~~ piecewise-defined functions, including step functions and absolute value functions.	Graph a piecewise-defined functions, including step functions and absolute value functions by hand and using technology. Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.
A1.F.BF.B.2 Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x), f(kx)*, 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. *Scope and Clarifications:* *i) Identifying the effect on the graph of replacing f(x) by f(x) + k, k f(x), and f(x+k) for specific values of k (both positive and negative) is limited to linear, quadratic, and absolute value functions.*	Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$. Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and kf(x). Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$.

Standards	Evidence of Learning Statements from Instructional Focus Document
ii) f(kx) will not be included in Algebra 1. It is addressed in Algebra 2. *iii) Experimenting with cases and illustrating an explanation of the effects on the graph using technology is limited to linear functions, quadratic functions, absolute value, and exponential functions with domains in the integers.* *iv) Tasks do not involve recognizing even and odd functions.*	Determine the value of k for a specific vertical or horizontal translation or vertical stretch or compression, given two graphs, the image and pre-image. Describe multiple effects on a graph for specific values of a, h, and k given two functions, $f(x)$ and $af(x + k)$. $+ k$.
A1.F.IF.B.3 For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Scope and Clarifications:* *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; and end behavior.* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, quadratic functions, absolute value functions, and exponential functions with domains in the integers.*	Identify all evident key features when provided a table of values representing a ~~linear, quadratic~~, or absolute value equation. Identify key features of the graph or table and interpret the meaning of the key features in relationship to the context of the problem, given a graph or table of values representing an absolute value function embedded in a real-world context. Sketch a graph of the function, given a verbal description of the key features of ~~a quadratic or~~ absolute value function.
A1.A.REI.D.6 Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the approximate solutions using technology. *Scope and Clarifications:* *Include cases where f(x) and/or g(x) are linear, quadratic, absolute value, and exponential functions. For example, $f(x) = 3x + 5$ and $g(x) = x^2 + 1$. Exponential functions are limited to domains in the integers.*	Approximate the solution(s) for f(x) = g(x) using technology when f(x) and g(x) are linear, quadratic, absolute value or exponential, given two equations f(x) and g(x) embedded in a real-world situation. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x).
A1.A.REI.A.1 Explain each step in solving an equation as following from the equality of numbers asserted at the previous step, starting from the	Solve ~~linear, quadratic~~, and absolute value equations using multiple solution strategies and explain each step in the solution path.

Standards	Evidence of Learning Statements from Instructional Focus Document
assumption that the original equation has a solution. Construct a viable argument to justify a solution method. *Scope and Clarifications:* *Tasks are limited to linear, quadratic, and absolute value equations with integer exponents.*	Construct a viable argument to justify a chosen solution path used to solve a linear, quadratic, and absolute value equation. Compare the steps in each and determine which solution path is most efficient, given an equation with multiple solution paths. Explain when an equation has no solution or infinitely many solutions.
A1.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.	Create and graph a two-variable linear, ~~quadratic, exponential,~~ absolute value, step, or piecewise equation that represents a mathematical situation.
A1.WCE.2 Informally assess the fit of a function by plotting and analyzing residuals. *This standard can be embedded with **A1.S.ID.B.4***	Assess the line of fit for the function based on the residual plot. Compute the residuals (observed value minus predicted value) for the set of data and the function of best fit. Construct a scatter plot of the residuals.
A1.WCE.3 Write the equation of piecewise functions given the graph.	Construct the equation of piecewise functions given the graph of the function.

Quarter 3

Standards	Evidence of Learning Statements from Instructional Focus Document
A1.F.LE.A.2 ★Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). *Scope and Clarifications:* *Tasks are limited to constructing linear and exponential functions in simple context (not multi-step).*	Construct an exponential function given a graph. Construct an exponential function given a table of values. Construct an exponential function given a description of a simple real-world relationship Construct an exponential function given a set of input-output pairs (ordered pairs). Construct a function given an arithmetic or geometric sequence or a description of one.
A1.F.LE.A.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	Compare the end behavior of graphs of lines, quadratics, polynomials, and exponentials to determine which increases faster. Find and compare the average rate of change of lines, quadratics, polynomials, and exponentials over equal intervals and make conclusions. Defend why a quantity increasing exponentially will eventually exceed a linear, quadratic, or polynomial function and justify their conclusion by testing values.
A1.F.BF.A.1 Write a function that describes a relationship between two quantities. **a.** Determine an explicit expression, a recursive process, or steps for calculation from a context. *Scope and Clarifications:* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, quadratic functions, and exponential functions with domains in the integers.*	~~Write a function defined by an expression to model a linear relationship, given a real-world context.~~ Write a function defined by an expression to model an exponential relationship with domain in the integers, given a real-world context. Compare key characteristics of real-world contexts that can be described by various types of

Standards	Evidence of Learning Statements from Instructional Focus Document
	functions.
A1.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.	Create and graph a two-variable linear, ~~quadratic~~, exponential, absolute value, step, or piecewise equation that represents a mathematical situation.
A1.F.BF.B.2 Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x), f(kx)*, 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. *Scope and Clarifications:* *i) Identifying the effect on the graph of replacing f(x) by f(x) + k, k f(x), and f(x+k) for specific values of k (both positive and negative) is limited to linear, quadratic, and absolute value functions.* *ii) f(kx) will not be included in Algebra 1. It is addressed in Algebra 2.* *iii) Experimenting with cases and illustrating an explanation of the effects on the graph using technology is limited to linear functions, quadratic functions, absolute value, and exponential functions with domains in the integers.* *iv) Tasks do not involve recognizing even and odd functions.*	Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$. Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and kf(x). Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$. Determine the value of k for a specific vertical or horizontal translation or vertical stretch or compression, given two graphs, the image and pre-image. Describe multiple effects on a graph for specific values of a, h, and k given two functions, $f(x)$ and $af(x + k)$. $+ k$.
A1.A.SSE.B.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. **c.** Use the properties of exponents to rewrite exponential expressions. *Scope and Clarifications:* *For example, the growth of bacteria can be modeled by either $f(t) = 3^{(t+2)}$ or $g(t) = 9(3^t)$ because the expression $3^{(t+2)}$ can be rewritten as $(3^t)(3^2) = 9(3^t)$.*	Generate an equivalent form of the exponential expression and identify the properties of exponents used to generate the equivalent expression, for an exponential expression embedded in a real-world context.

Standards	Evidence of Learning Statements from Instructional Focus Document
i) Tasks have a real-world context. As described in the standard, there is an interplay between the mathematical structure of the expression and the structure of the situation such that choosing and producing an equivalent form of the expression reveals something about the situation. *ii) Tasks are limited to exponential expressions with integer exponents.*	
A1.F.LE.A.1 ★Distinguish between situations that can be modeled with linear functions and with exponential functions. **a.** Recognize that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. **b.** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. **c.** Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.	Informally show or explain that exponential functions grow by multiplying the same factor per unit. This should be done algebraically, graphically, and using words in context of a real-world application. Determine if a given real-world situation can be modeled by an exponential function. Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay.
A1.F.LE.B.4 Interpret the parameters in a linear or exponential function in terms of a context. *Scope and Clarifications:* *For example, the total cost of an electrician who charges 35 dollars for a house call and 50 dollars per hour would be expressed as the function y = 50x +35. If the rate were raised to 65 dollars per hour, describe how the function would change.* *i) Tasks have a real-world context.* *ii) Exponential functions are limited to those with domains in the integers*	Given an exponential function with a domain in the integers, explain the meaning of the coefficient, the base, and the exponent in context of the real-world situation. Predict and determine how an exponential function is affected by a change in the coefficient, base, or exponent. Explain this change in context.
A1.A.SSE.A.1 ★Interpret expressions that represent a quantity in terms of its context.	Interpret parts of an expression (i.e. term, factor, coefficient) embedded in a real-world situation and explain each part in terms of the context.

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Standards	Evidence of Learning Statements from Instructional Focus Document
a. Interpret parts of an expression, such as terms, factors, and coefficients. **b.** Interpret complicated expressions by viewing one or more of their parts as a single entity. *Scope and Clarifications:* *For example, interpret $P\ (1+r)^n$ as the product of P and a factor not depending on P.*	Interpret parts of an expression (i.e. term, factor, and coefficient) and explain each part in terms of the function the expression defines. Explain the structure of an expression and how each term is related to the other terms by interpreting the arithmetic meaning of each term in the expression and recognizing when combining like terms is appropriate. Interpret an expression by describing each individual term as a single entity and the relationship to the expression.
A1.A.APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	Add polynomial expressions. Subtract two polynomial expressions. Multiply polynomial expressions. Explain what it means for polynomials to be closed under the operations of addition, subtraction, and multiplication.
A1.A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it. *Scope and Clarifications:* *For example, recognize $53^2 - 47^2$ as a difference of squares and see an opportunity to rewrite it in the easier-to-evaluate form (53 + 47) (53 – 47).* *See an opportunity to rewrite $a^2 + 9a + 14$ as $(a+7)(a+2)$.*	Rewrite numerical and polynomial expressions in a different form and explain why rewriting the expression in that form is beneficial. For clarification, refer to Level 1 and Level 2 Evidence of Learning Statements here to see the progression of what we want our students to know.
A1.F.IF.B.3 ★For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Scope and Clarifications:*	Identify all evident key features when provided a table of values representing a ~~linear~~, quadratic~~, or absolute value equation.~~ Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with domain in the integers.

Standards	Evidence of Learning Statements from Instructional Focus Document
Key features include intercepts, intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	Identify key features of the graph or table and interpret the meaning of the key features in relationship to the context of the problem, given a graph or table of values representing a quadratic function embedded in a real-world context. Identify key features of the graph or table and interpret the meaning of the key features in relationship to the context of the problem, given a graph or table of values representing an absolute value function embedded in a real-world context. Identify key features of the graph and interpret the meaning of the key features in relationship to the context of the problem, given a graph of an exponential function with domain in the integers embedded in a real-world context. Sketch a graph of the function, given a verbal description of the key features of a quadratic or ~~absolute value~~ function.
A1.A.CED.A.2 Create equations in two or more variables to represent relationships between quantities; graph equations with two variables on coordinate axes with labels and scales.	Create and graph a two variable linear, quadratic, exponential, absolute value, step, or piecewise equation that represents a mathematical situation.
A1.F.BF.B.2 Identify the effect on the graph of replacing *f(x)* by *f(x) + k, k f(x), f(kx)*, 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. *Scope and Clarifications:* *i) Identifying the effect on the graph of replacing f(x) by f(x) + k, k f(x), and f(x+k) for specific values of k (both positive and negative) is limited to linear, quadratic, and absolute value functions.* *ii) f(kx) will not be included in Algebra 1. It is addressed in Algebra 2.*	Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$. Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $k(x)$. Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$. Determine the value of k for a specific vertical or horizontal translation or vertical stretch or compression, given two graphs, the image and pre-image.

Standards	Evidence of Learning Statements from Instructional Focus Document
iii) Experimenting with cases and illustrating an explanation of the effects on the graph using technology is limited to linear functions, quadratic functions, absolute value, and exponential functions with domains in the integers. *iv) Tasks do not involve recognizing even and odd functions.*	Describe multiple effects on a graph for specific values of a, h, and k given two functions, $f(x)$ and $a(x + h) + k$.
A1.F.IF.A.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	Given a function that represents a real-world problem, determine what each variable represents. Given a function that represents a real-world problem, interpret the meaning of output values when given input values and vice versa. Use multiple representations to model a function in a real-world situation.
A1.F.BF.A.1 Write a function that describes a relationship between two quantities. **a.** Determine an explicit expression, a recursive process, or steps for calculation from a context. *Scope and Clarifications:* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, quadratic functions, and exponential functions with domains in the integers.*	Write a function defined by an expression to model a linear relationship, given a real-world context. Write a function defined by an expression to model a quadratic relationship, given a real-world context. Write a function defined by an expression to model an exponential relationship with domain in the integers, given a real-world context. Compare key characteristics of real-world contexts that can be described by various types of functions.
A1.F.IF.C.7 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	Interpret the meaning of zeros, y-intercept, extreme value, and the axis of symmetry in the context of a real-word problem. Recognize which form of a quadratic function is most appropriate for revealing certain properties, when given a real-world problem.

Standards	Evidence of Learning Statements from Instructional Focus Document
a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	
A1.F.IF.C.6 Graph functions expressed symbolically and show key features of the graph, by hand and using technology. **a.** Graph linear and quadratic functions and show intercepts, maxima, and minima.	Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima. Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.
A1.A.APR.B.2 Identify zeros of polynomials when suitable factorizations are available and use the zeros to construct a rough graph of the function defined by the polynomial. *Scope and Clarifications:* *Graphing is limited to linear and quadratic polynomials.*	Identify the zeros of a polynomial equation of degree 3 or greater when the factorization is provided. Find the zeros of a quadratic equation and use them to graph the quadratic equation.
A1.A.REI.B.3 Solve quadratic equations and ~~inequalities~~ in one variable. **b.** Solve quadratic equations by inspection *(e.g., for $x^2 = 49$)*, taking square roots, ~~completing the square, knowing and applying the quadratic formula~~, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions.	Solve quadratic equations in one variable using multiple strategies. Determine if a quadratic equation in one-variable has real solutions or complex solutions.
A1.A.SSE.B.3 ★Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. **a.** Factor a quadratic expression to reveal the zeros of the function it defines. **b.** Complete the square in a quadratic expression in the form $Ax^2 + Bx + C$ to reveal the maximum or minimum value of the function it defines.	Factor a quadratic expression to reveal the zeros of the function it defines. Identify equivalent forms of quadratic expressions. Determine the maximum or minimum value of a function defined by a quadratic expression in the form $Ax^2 + Bx + C$ by completing the square.
A1.A.SSE.A.2 Use the structure of an expression to identify ways to rewrite it. *Scope and Clarifications:*	Rewrite numerical and polynomial expressions in a different form and explain why rewriting the expression in that form is beneficial.

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Standards	Evidence of Learning Statements from Instructional Focus Document
For example, recognize $53^2 - 47^2$ as a difference of squares and see an opportunity to rewrite it in the easier-to-evaluate form (53 + 47) (53 – 47). See an opportunity to rewrite $a^2 + 9a + 14$ as $(a + 7)(a + 2)$.	
A1.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. *Scope and Clarifications:* *Tasks are limited to linear, quadratic, or exponential equations with integer exponents.*	Create and solve a one variable ~~linear~~, quadratic, ~~or exponential~~ equation that represents a real-world situation. Create and solve a one-variable linear inequality that represents a real-world situation. Create and solve a one-variable quadratic or exponential inequality that represents a simple real-world situation.
A1.A.REI.B.3 Solve quadratic equations and inequalities in one variable. **a.** Use the method of completing the square to rewrite any quadratic equation in *x* into an equation of the form *$(x – p)^2 = q$* that has the same solutions. Derive the quadratic formula from this form. **b.** Solve quadratic equations by inspection *(e.g., for $x^2 = 49$)*, taking square roots, completing the square, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions.	Use the method of completing the square to rewrite a quadratic equation when $a = 1$, in the form of $(x – p)^2 = q$. Use the method of completing the square to rewrite a quadratic equation when $a \neq 1$, in the form of $(x – p)^2 = q$. Derive the quadratic formula from standard form using the method of completing the square and explain the steps. Solve quadratic equations in one variable using multiple strategies. Determine if a quadratic equation in one-variable has real solutions or complex solutions. Solve a simple quadratic inequality when a =1 in one variable.
A1.A.SSE.B.3 ★Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. **a.** Factor a quadratic expression to reveal the zeros of the function it defines.	Factor a quadratic expression to reveal the zeros of the function it defines. Identify equivalent forms of quadratic expressions. Determine the maximum or minimum value of a function defined by a quadratic expression in the form $Ax^2 + Bx + C$ by completing the square

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Standards	Evidence of Learning Statements from Instructional Focus Document
b. Complete the square in a quadratic expression in the form $Ax^2 + Bx + C$ to reveal the maximum or minimum value of the function it defines.	
A1.F.IF.C.7 Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. **a.** Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	Interpret the meaning of zeros, y-intercept, extreme value, and the axis of symmetry in the context of a real-word problem. Recognize which form of a quadratic function is most appropriate for revealing certain properties, when given a real-world problem.
A1.WCE.4 Graph exponential functions showing intercepts and end behavior.	Graph exponential functions by hand and using technology and identify the intercepts and end behavior. Graph exponential functions by hand using transformations from the parent function.
A1.WCE.5 Complete the square to solve quadratic equations. **This extends learning objectives from **A1.A.REI.B.3.***	Use the method of completing the square to rewrite a quadratic equation when $a \neq 1$, in the form of $(x - p)^2 = q$.
A1.WCE.6 Model real-world scenarios with quadratic equations, using the projectile motion equation.	Write projectile motion equations using the equation $h(t)=-16t^2+vt+s$ Determine when a projectile will reach its maximum height, the maximum height a projectile will reach, and how long it will take the projectile to land back on the ground. Explain why a projectile might reach a specific height at two different times. Identify extraneous solutions when modeling projectiles.

Quarter 4

Standards	Evidence of Learning Statements from Instructional Focus Document
A1.F.IF.B.4 ★Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *Scope and Clarifications:* *For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*	Explain how the domain relates to the graph of a function. Explain why a function is continuous or discrete given an equation. Describe how a function's domain is affected when situated within a context. Explain if a function is continuous or discrete, given a context.
A1.F.LE.A.1 Distinguish between situations that can be modeled with linear functions and with exponential functions. **a.** Recognize that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. **b.** Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. **c.** Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.	Recognize that linear functions have a constant rate of change, while exponential functions do not. Informally show or explain that linear functions grow by adding the same number per unit. This should be done algebraically, graphically, and using words in context of a real-world application. Determine if a given real-world situation has a constant rate of change and can be modeled by a linear function. Informally show or explain that exponential functions grow by multiplying the same factor per unit. This should be done algebraically, graphically, and using words in context of a real-world application. Given an exponential function with a domain in the integers, explain the meaning of the coefficient, the base, and the exponent in context of the real-world situation. Determine if a given real-world situation can be modeled by an exponential function.

Standards	Evidence of Learning Statements from Instructional Focus Document
	Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay.
A1.F.IF.C.8 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *Scope and Clarifications:* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, quadratic functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers*	Compare properties of two exponential functions each represented in a different way. Compare properties of two piecewise-defined functions each represented in a different way. Compare properties of two quadratic functions each represented in a different way. Compare properties of two functions from different function families each represented in a different way.
A1.F.LE.A.3 Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	Compare the end behavior of graphs of lines, quadratics, polynomials, and exponentials to determine which increases faster. Find and compare the average rate of change of lines, quadratics, polynomials, and exponentials over equal intervals and make conclusions. Defend why a quantity increasing exponentially will eventually exceed a linear, quadratic, or polynomial function and justify their conclusion by testing values.
A1.F.LE.B.4 Interpret the parameters in a linear or exponential function in terms of a context. *Scope and Clarifications:* *For example, the total cost of an electrician who charges 35 dollars for a house call and 50 dollars per hour would be expressed as the function y = 50x +35. If the rate were raised to 65 dollars per hour, describe how the function would change.* *i) Tasks have a real-world context.*	Explain the meaning of the slope and y-intercept in context of the real-world situation, given a linear function. Given an exponential function with a domain in the integers, explain the meaning of the coefficient, the base, and the exponent in context of the real-world situation. Predict and determine how a linear function is affected by a change in the slope or y-intercept.

Standards	Evidence of Learning Statements from Instructional Focus Document
ii) Exponential functions are limited to those with domains in the integers.	Explain this change in context. Predict and determine how an exponential function is affected by a change in the coefficient, base, or exponent. Explain this change in context.
A1.F.IF.B.5 Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. *Scope and Clarifications:* *i) Tasks have a real-world context.* *ii) Tasks are limited to linear functions, quadratic functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.*	Calculate average rate of change when given an equation or table of a quadratic, absolute value, piecewise, or exponential functions, where exponential functions are limited to domains in the integers. Interpret the average rate of change of a quadratic, absolute value, piece-wise, or exponential functions, where exponential functions are limited to domains in the integers. Estimate the average rate of change for a specific interval of a quadratic, absolute value, piece-wise, or exponential function when given a graph, where exponential functions are limited to domains in the integers.
A1.A.CED.A.1 Create equations and inequalities in one variable and use them to solve problems. *Scope and Clarifications:* *Tasks are limited to linear, quadratic, or exponential equations with integer exponents.*	Create and solve a one variable linear, quadratic, or exponential equation that represents a real-world situation. Create and solve a one-variable linear inequality that represents a real-world situation. Create and solve a one-variable quadratic or exponential inequality that represents a simple real-world situation.
A1.F.IF.C.6 Graph functions expressed symbolically and show key features of the graph, by hand and using technology. **b.** Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	Graph a linear function by hand and using technology and identify the slope and intercepts. Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima. Graph a piecewise-defined functions, including step functions and absolute value functions by hand and using technology.

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Standards	Evidence of Learning Statements from Instructional Focus Document
***Revisiting this standard here allows students to graph all function types by hand and review the different functions learned in Algebra I. This standard appears in Quarters 1, 2, and 3 also.	Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.
A1.WCE.7 Operate (add, subtract, multiply, divide, simplify, powers) with radicals and radical expressions including radicands involving rational numbers and algebraic expressions.	Model with radical expressions. Simplify, multiply, divide, add, subtract with radical expressions. Rationalize the denominator.
A1.WCE.8 (A1.A.APR.6) Rewrite simple rational expressions in different forms; write *a(x) / b(x)* in the form *q(x)+r(x) / b(x)*, where *a(x)* , *b(x)* , *q(x)* , and *r(x)* are polynomials with the degree of *r(x)* less than the degree of *b(x)*, using inspection, long division, or, for the more complicated examples, a computer algebra system.	Compare rational expressions by writing them in different but equivalent forms. Perform operations, such as, add, subtract, multiply and divide, with rational expressions and simplify using equivalent forms.
A1.WCE.9 Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	