**WHCSD Scope and Sequence** **Algebra I** **2021-2022**

Algebra I Scope and Sequence

| **Domain** | **Quarter 1** | **Quarter 2** | **Quarter 3** | **Quarter 4** |
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| | **46 Days** | **42 Days** | **46 Days** | **47 Days** |
| | **Standard** | **Standard** | **Standard** | **Standard** |
| **SEEING STRUCTURE IN EXPRESSIONS**<br>**A.SSE** Interpret the structure of expressions.<br><br>**ARITHMETIC WITH POLYNOMIALS AND RATIONAL EXPRESSIONS**<br>**A.APR** Perform arithmetic operations on polynomials.<br><br>**REASONING WITH EQUATIONS AND INEQUALITIES**<br>**A.REI** Understand solving equations as a process of reasoning and explain the reasoning.<br><br>**INTERPRETING FUNCTIONS**<br>**F.IF** Understand the concept of a function, and use function notation. Analyze | F-IF.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*).<br><br>F-IF.2. Use function notation, evaluates functions for inputs in their domains, and interpret statements that use function notation in terms of a context.<br><br>F-IF.4. 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. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* (A2, M3) a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2)<br><br>F-IF.5. Relate the domain of a | N-Q.1. Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.<br><br>*N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.*<br><br>N-Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br><br>A-SSE.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1 + r)^n$ as the product of P and a factor not depending on P.<br><br>A-CED.1. Create equations and inequalities in one variable [including ones with absolute value (California Addition)] and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. a. Focus on applying linear and simple exponential expressions. (A1, M1) b. Focus on applying | F-IF.4. 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. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* (A2, M3) a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2)<br><br>F-IF.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. 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. a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and | A-SSE.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret P(1+r)n as the product of P and a factor not depending on P.*<br><br>A-SSE.3a. Factor a quadratic expression to reveal the zeros of the function it defines.<br><br>A-SSE.3c. Use the properties of exponents to transform expressions for exponential functions. *For example,* $8^t$ *can be written as* $2^{3t}$<br><br>A-REI.1. Explain each step in solving a simple 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.<br><br>A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.<br><br>A-REI.4a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p) 2 = q that has the same solutions. b. Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for $x^2 = 49$; taking |

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| ent representations.<br>**BUILDING FUNCTIONS**<br>**F.BF** Build a function that models a relationship between two quantities. Build new functions from existing functions.<br><br>**LINEAR, QUADRATIC, AND EXPONENTIAL MODELS**<br>**F.LE** Construct and compare linear, quadratic, and exponential models, and solve problems. | function to its graph and, where applicable, to the quantitative relationship it describes. 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. a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2) c. Emphasize the selection of a type of function for a model based on behavior of data and context. (A2, M3)<br><br>F-IF.6. 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.<br><br>F.IF.7 Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. (A1, M1) b. Graph quadratic functions and indicate intercepts, maxima, and minima. (A1, M2) c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (A2, | simple quadratic expressions. (A1, M2) c. Extend to include more complicated function situations with the option to solve with technology. (A2, M3)<br><br>A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.<br><br>A-CED.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. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. a. While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.<br><br>A-REI.5. Verify that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.<br><br>A.REI.6 Solve systems of linear equations algebraically and graphically. a. Limit to pairs of linear equations in two variables. (A1, M1) b. Extend to include solving systems of linear equations in three variables, but only algebraically. (A2, M3) | exponential functions. (A1, M2) c. Emphasize the selection of a type of function for a model based on behavior of data and context. (A2, M3)<br><br>F-IF.6. 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.<br><br>F.IF.7 Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. (A1, M1) b. Graph quadratic functions and indicate intercepts, maxima, and minima. (A1, M2) c. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. (A2, M3) d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior. (A2, M3) e. Graph simple exponential functions, | square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring. (+) c. Derive the quadratic formula using the method of completing the square.<br><br>A-REI.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. *For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.*<br><br>A-REI.11. 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 solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★<br><br>F-IF.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).<br><br>F-IF.4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and |

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| | M3) d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior. (A2, M3) e. Graph simple exponential functions, indicating intercepts and end behavior. (A1, M1) f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (A2, M3) g. (+) Graph rational functions, identifying zeros and asymptotes, when factoring is reasonable, and indicating end behavior. h. (+) Graph logarithmic functions, indicating intercepts and end behavior.<br><br>F-IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum. (A2, M3) a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2)<br><br>F-LE.1a. Show that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.<br><br>F-LE.1b. Recognize situations in which one quantity changes at a constant rate per unit interval | A-REI.10. 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).<br><br>F-LE.1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.<br><br>F-LE.1c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.<br><br>F-LE.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).<br><br>F-LE.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.<br><br>F-BF.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★<br><br>F-IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a | indicating intercepts and end behavior. (A1, M1) f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (A2, M3) g. (+) Graph rational functions, identifying zeros and asymptotes, when factoring is reasonable, and indicating end behavior. h. (+) Graph logarithmic functions, indicating intercepts and end behavior.<br><br>F.IF.8 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. (A2, M3) i. Focus on completing the square to quadratic functions with the leading coefficient of 1. (A1) b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02) t , and y = (0.97) t and classify them as representing exponential growth or decay. (A2, M3) i. Focus on exponential functions evaluated at | sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.** (A2, M3) a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2)<br><br>F-IF.5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. *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.** a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2) c. Emphasize the selection of a type of function for a model based on behavior of data and context. (A2, M3)<br><br>F.IF.7 Graph functions expressed symbolically and indicate key features of the graph, by hand in simple cases and using technology for more complicated cases. Include applications and how key features relate to characteristics of a situation, making selection of a particular type of function model appropriate.★ a. Graph linear functions and indicate intercepts. (A1, M1) b. Graph quadratic functions and indicate intercepts, maxima, and minima. (A1, M2) c. Graph square root, cube root, and |

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| | relative to another.<br><br>F-LE.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).<br><br>F-LE.5. Interpret the parameters in a linear or exponential function in terms of a context. F-BF.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context.<br><br>A-SSE.1a. Interpret parts of an expression, such as terms, factors, and coefficients.<br><br>A-SSE.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1 + r)^n$ as the product of P and a factor not depending on P.<br><br>A-SSE.3a. Factor a quadratic expression to reveal the zeros of the function it defines.<br><br>A-SSE.3c. Use the properties of exponents to transform expressions for exponential functions. *For example,* $8^t$ *can be written as* $2^{3t}$<br><br>F-BF.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context. i. Focus on linear and exponential functions. (A1, M1) | subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1. N-Q.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.<br><br>F-IF. 7f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (A2, M3)<br><br>S-ID.6a. 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. Emphasize linear and exponential models.<br><br>S-ID.6b. Informally assess the fit of a function by plotting and analyzing residuals.<br><br>S-ID.6c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>S-ID.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.<br><br>S-ID.8. Compute (using technology) and interpret the correlation coefficient of a linear | integer inputs. (A1, M2)<br><br>F-IF.9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum. (A2, M3) a. Focus on linear and exponential functions. (M1) b. Focus on linear, quadratic, and exponential functions. (A1, M2)<br><br>F-LE.1a. Show that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.<br><br>F-LE.1c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.<br><br>F-LE.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). | piecewise-defined functions, including step functions and absolute value functions. (A2, M3) d. Graph polynomial functions, identifying zeros, when factoring is reasonable, and indicating end behavior. (A2, M3) e. Graph simple exponential functions, indicating intercepts and end behavior. (A1, M1) f. Graph exponential functions, indicating intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. (A2, M3) g. (+) Graph rational functions, identifying zeros and asymptotes, when factoring is reasonable, and indicating end behavior. h. (+) Graph logarithmic functions, indicating intercepts and end behavior.<br><br>F.IF.8 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. (A2, M3) i. Focus on completing the square to quadratic functions with the leading coefficient of 1. (A1) b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as y = (1.02) t , and y = (0.97) t and classify them as representing exponential growth or decay. (A2, M3) i. Focus on exponential functions evaluated at integer inputs. (A1, M2)<br><br>F-BF.3. Identify the effect on the graph of replacing f(x) by f(x) + k, k |

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| | ii. Focus on situations that exhibit quadratic or exponential relationships. (A1, M2)<br><br>A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. a. Focus on applying linear and simple exponential expressions. (A1, M1) b. Focus on applying simple quadratic expressions. (A1, M2) c. Extend to include more complicated function situations with the option to graph with technology. (A2, M3)<br><br>A-CED.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V =IR to highlight resistance R.<br>a. Focus on formulas in which the variable of interest is linear or square. For example, rearrange Ohm's law V=IR to highlight resistance R, or rearrange the formula for the area of a circle A=(π)$r^2$ to highlight radius r. (A1) b. Focus on formulas in which the variable of interest is linear. For example, rearrange Ohm's law V=IR to highlight resistance R. (M1) c. Focus on formulas in which the variable of interest is linear or square. For example, rearrange the formula for the area of a circle A=(π)$r^2$ to highlight radius r. (M2) d. While functions will often be linear, exponential, or quadratic, the | fit.<br><br>S-ID.9. Distinguish between correlation and causation. | F-LE.5. Interpret the parameters in a linear or exponential function in terms of a context.<br><br>F-BF.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context. i. Focus on linear and exponential functions. (A1, M1) ii. Focus on situations that exhibit quadratic or exponential relationships. (A1, M2)<br><br>A-CED.1. Create equations and inequalities in one variable [including ones with absolute value (California Addition)] and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.<br>a. Focus on applying linear and simple exponential expressions. (A1, M1) b. Focus on applying simple quadratic expressions. (A1, M2) c. Extend to include more complicated function situations with the option to solve with technology. (A2, M3)<br><br>A-CED.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. a. Focus on applying linear | 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. *Include recognizing even and odd functions from their graphs and algebraic expressions for them.* (A2, M3) a. Focus on transformations of graphs of quadratic functions, except for f (kx ). (A1, M2)<br><br>F.BF.4 Find inverse functions. a. Informally determine the input of a function when the output is known. (A1, M1) b. (+) Read values of an inverse function from a graph or a table, given that the function has an inverse. (A2, M3) c. (+) Verify by composition that one function is the inverse of another. (A2, M3) d. (+) Find the inverse of a function algebraically, given that the function has an inverse. (A2, M3) e. (+) Produce an invertible function from a non-invertible function by restricting the domain.<br><br>F-LE.1a. Show that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.<br><br>F-LE.1c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.<br><br>F-LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a |

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| | types of problems should draw from more complicated situations. (A2, M3)<br><br>N-Q.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.<br><br>N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.<br><br>A-REI.1. Explain each step in solving a simple 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.<br><br>A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.<br><br>A-REI.10. *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).*<br><br>A-APR.1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, | | and simple exponential expressions. (A1, M1) b. Focus on applying simple quadratic expressions. (A1, M2) c. Extend to include more complicated function situations with the option to graph with technology. (A2, M3)<br><br>A-CED.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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*<br>a. While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations.<br><br>A-SSE.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1 + r)^n$ as the product of P and a factor not depending on P.<br><br>A.SSE.2 Use the structure of an expression to identify ways to rewrite it. *For example, to factor 3x(x – 5) + 2(x – 5), students should recognize that the "x – 5" is* | relationship, or two input-output pairs (include reading these from a table).<br><br>F-LE.5. Interpret the parameters in a linear or exponential function in terms of a context.<br><br>S-ID.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).<br><br>S-ID.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.<br><br>S-ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).<br><br>S-ID.5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.<br><br>S-ID.6a. 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. Emphasize linear, quadratic, and exponential models.*<br><br>S-ID.6b. Informally assess the fit of a function by plotting and analyzing residuals. |

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| | subtraction, and multiplication; add, subtract, and multiply polynomials.<br>a. Focus on polynomial expressions that simplify to forms that are linear or quadratic. (A1, M2) b. Extend to polynomial expressions beyond those expressions that simplify to forms that are linear or quadratic. (A2, M3) | | *common to both expressions being added, so it simplifies to (3x+2)(x – 5);* or see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.<br><br>A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★<br>3a. Factor a quadratic expression to reveal the zeros of the function it defines.<br>3b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.<br>3c. Use the properties of exponents to transform expressions for exponential functions. *For example, $8^t$ can be written as $2^{3t}$*<br><br>A-REI.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.<br><br>A-REI.4a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form (x – p) 2 = q that has the same | S-ID.6c. Fit a linear function for a scatter plot that suggests a linear association.<br><br>S-ID.7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.<br><br>S-ID.8. Compute (using technology) and interpret the correlation coefficient of a linear fit.<br><br>N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.<br><br>N-Q.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.<br><br>A-CED.1. Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*<br>a. Focus on applying linear and simple exponential expressions. (A1, M1) b. Focus on applying simple quadratic expressions. (A1, M2) c. Extend to include more complicated function situations with the option to solve with technology. (A2, M3)<br><br>A-CED.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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.* |

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| | | | solutions. b. Solve quadratic equations as appropriate to the initial form of the equation by inspection, e.g., for $x^2 = 49$; taking square roots; completing the square; applying the quadratic formula; or utilizing the Zero-Product Property after factoring. (+) c. Derive the quadratic formula using the method of completing the square.<br><br>A-REI.7. Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = –3x and the circle x2 + y2 = 3.<br><br>A-REI.10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the | a. While functions will often be linear, exponential, or quadratic, the types of problems should draw from more complicated situations. |

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| | | | coordinate plane, often forming a curve (which could be a line).<br><br>A.REI.12 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.<br><br>N-Q.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.<br><br>N-Q.2. Define appropriate quantities for the purpose of descriptive modeling. | |
| **Resources** | CPM (College Preparatory Math) Chapters 1-3<br>ODE Model Curriculum<br>GAISE model framework | CPM (College Preparatory Math) Chapters 4-6<br>ODE Model Curriculum<br>GAISE model framework | CPM (College Preparatory Math) Chapters 7-9<br>ODE Model Curriculum<br>GAISE model framework | CPM (College Preparatory Math) Chapters 10-11<br>ODE Model Curriculum<br>GAISE model framework |
| **Notes:** | **Mathematical Practices**<br>**1.** Make sense of problems and persevere in solving them.<br>2. Reason abstractly and quantitatively.<br>3. Construct viable arguments and critique the reasoning of others.<br>4. Model with mathematics.<br>5. Use appropriate tools strategically.<br>6. Attend to precision.<br>7. Look for and make use of structure.<br>8. Look for and express regularity in repeated reasoning. | | | |

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