

| Day | SAVVAS Envision Lesson | SAVVAS Envision Objective | TN ALG 1 Standard | TN ALG 1 IFD Level 3 |
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| 1 | 1-1 Operations on Real Numbers | Find the sum or product of two rational numbers and explain why the sum or product is rational. Find the sum or product of rational and irrational numbers and explain when the sum or product is irrational. | A.REI.A.1: Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method. | Solve linear, quadratic, and absolute value equations using multiple solution strategies and explain the solution path. Construct a viable argument to justify a chosen solution path used to solve a linear, quadratic, and absolute value equation. Determine an efficient solution path, given a linear, quadratic, or absolute value equation with multiple solution paths. |
| 2 | 1-2 Solving Linear Equations | Explain that each step in solving a linear equation follows from equality in the previous step. Create and solve linear equation with one variable using the properties of equality. | A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-world context.* A.REI.A.1: Understand solving equations as a process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method. A.REI.B.2.a: Solve linear and absolute value equations and inequalities in one variable. a.Solve linear equations and inequalities, including compound inequalities, in one variable. Represent solutions algebraically and graphically. | Create and solve a one-variable linear, quadratic, or absolute value 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 absolute value inequality that represents a simple real-world situation. Solve linear, quadratic, and absolute value equations using multiple solution strategies and explain the solution path. Construct a viable argument to justify a chosen solution path used to solve a linear, quadratic, and absolute value equation. Determine an efficient solution path, given a linear, quadratic, or absolute value equation with multiple solution paths. Solve multi-step linear equations and inequalities in one variable with integer, rational, and/or irrational coefficients. Solve compound inequalities in one variable. Represent solutions algebraically and graphically on a number line. Solve absolute value equations and inequalities in one variable. Represent solutions algebraically and graphically on a number line. Solve linear and absolute value equations with one solution, infinitely many or no solutions. |
| 3 | 1-3 Solving Equations with a Variable on Both Sides | Use the properties of equality to solve linear equations with variables on both sides. Identify whether linear equations have one solution, infinitely many solutions, or no solution. | A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-world context.* A.REI.A.1: Understand solving equations as a | Create and solve a one-variable linear, quadratic, or absolute value 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 absolute value inequality that represents a simple real-world situation. Solve linear, quadratic, and absolute value equations using multiple solution strategies and explain the solution path. |

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| | | | process of reasoning and explain the reasoning. Construct a viable argument to justify a solution method. | Construct a viable argument to justify a chosen solution path used to solve a linear, quadratic, and absolute value equation. Determine an efficient solution path, given a linear, quadratic, or absolute value equation with multiple solution paths. |
| | | | A.REI.B.2.a: Solve linear and absolute value equations and inequalities in one variable. a.Solve linear equations and inequalities, including compound inequalities, in one variable. Represent solutions algebraically and graphically. | Solve multi-step linear equations and inequalities in one variable with integer, rational, and/or irrational coefficients. Solve compound inequalities in one variable. Represent solutions algebraically and graphically on a number line. Solve absolute value equations and inequalities in one variable. Represent solutions algebraically and graphically on a number line. Solve linear and absolute value equations with one solution, infinitely many or no solutions. |
| | | | N.Q.A.1.c: Use units as a way to understand real-world problems. c. Define and justify appropriate quantities within a context for the purpose of modeling.* | Make observations about extraneous information embedded in context and explain why information is extraneous in a real-world problem. Choose an appropriate level of accuracy, including appropriate units, when reporting quantities in a real-world context. 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). |
| 4 | 1-4 Literal Equations and Formulas | Rearrange formulas and equations to highlight a quantity of interest by isolating the variable using the same reasoning used to solve equations. Use formulas and equations to solve problems | A.CED.A.4: Rearrange formulas to isolate a quantity of interest using algebraic reasoning.* | Solve an equation to be written in an equivalent form. Rearrange real-world linear, quadratic, or absolute value formulas to highlight a quantity of interest. |
| 5 | Assessment | | | |
| 6 | 1-5 Solving Inequalities in One Variable | Create and solve inequalities in one variable. Interpret solutions to inequalities within the context. Identify inequalities as true or false based on the number of solutions. | A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-world context.* A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret | Create and solve a one-variable linear, quadratic, or absolute value equation that <u>represents a real-world situation</u> . Create and solve a one-variable linear inequality that represents a real-world situation. Create and solve a one-variable quadratic or absolute value inequality that represents a simple real-world situation. Write an equation or inequality that models the constraint on a variable given a contextual situation. Write a system of equations or inequalities that models the constraint on a variable given a contextual situation. Explain constraints on a variable in context of a real-world situation. |

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| | | | <p>solutions as viable or non-viable.*</p> <p>Justify solutions that model real-world situation when there are limitations on a variable.</p> <p>Interpret solutions as viable or nonviable options in a contextual situation.</p> |
| | | | <p>A.REI.B.2.a: Solve linear and absolute value equations and inequalities in one variable. a.Solve linear equations and inequalities, including compound inequalities, in one variable. Represent solutions algebraically and graphically.</p> <p>Solve multi-step linear equations and inequalities in one variable with integer, rational, and/or irrational coefficients.</p> <p>Solve compound inequalities in one variable. Represent solutions algebraically and graphically on a number line.</p> <p>Solve absolute value equations and inequalities in one variable. Represent solutions algebraically and graphically on a number line.</p> <p>Solve linear and absolute value equations with one solution, infinitely many or no solutions.</p> |
| 7 | 1-6 Compound Inequalities | <p>Create and solve a system of inequalities. Interpret the solution to a compound inequality within a modeling context.</p> | <p>A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-world context.*</p> <p>Create and solve a one-variable linear, quadratic, or absolute value equation that represents a real-world situation.</p> <p>Create and solve a one-variable linear inequality that represents a real-world situation.</p> <p>Create and solve a one-variable quadratic or absolute value inequality that represents a simple real-world situation.</p> <p>A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.*</p> <p>Write an equation or inequality that models the constraint on a variable given a contextual situation.</p> <p>Write a system of equations or inequalities that models the constraint on a variable given a contextual situation.</p> <p>Explain constraints on a variable in context of a real-world situation.</p> <p>Justify solutions that model real-world situation when there are limitations on a variable.</p> <p>Interpret solutions as viable or nonviable options in a contextual situation.</p> <p>A.REI.B.2.a: Solve linear and absolute value equations and inequalities in one variable. a.Solve linear equations and inequalities, including compound inequalities, in one variable. Represent solutions algebraically and graphically.</p> <p>Solve multi-step linear equations and inequalities in one variable with integer, rational, and/or irrational coefficients.</p> <p>Solve compound inequalities in one variable. Represent solutions algebraically and graphically on a number line.</p> <p>Solve absolute value equations and inequalities in one variable. Represent solutions algebraically and graphically on a number line.</p> <p>Solve linear and absolute value equations with one solution, infinitely many or no solutions.</p> |
| 8 | 1-7 Absolute Value Equations and Inequalities | <p>Solve absolute value equations and inequalities. Use absolute value equations and inequalities to solve problems.</p> | <p>A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-</p> <p>Create and solve a one-variable linear, quadratic, or absolute value equation that represents a real-world situation.</p> <p>Create and solve a one-variable linear inequality that represents a real-world situation.</p> |

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| | | | world context.* | Create and solve a one-variable quadratic or absolute value inequality that represents a simple real-world situation. |
| | | | A.REI.B.2.b: A1.A.REI.B.2 Solve linear and absolute value equations and inequalities in one variable. b.Solve absolute value equations and inequalities in one variable. Represent solutions algebraically and graphically. | Solve multi-step linear equations and inequalities in one variable with integer, rational, and/or irrational coefficients. Solve compound inequalities in one variable. Represent solutions algebraically and graphically on a number line. Solve absolute value equations and inequalities in one variable. Represent solutions algebraically and graphically on a number line Solve linear and absolute value equations with one solution, infinitely many or no solutions. |
| 9 | Assessment | | | |
| 10 | 2-1 Slope-Intercept Form | Write linear equations in two variables using slope-intercept form to represent the relationship between two quantities. Interpret the slope and intercept of a linear model. | F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs. * S.ID.C.5: Interpret the rate of change and the constant term of a linear model in the context of data.* | 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 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. Interpret the rate of change of a linear model in the context of the data. Interpret the constant term of a linear model in the context of the data. |
| 11 | 2-2 Point-Slope Form | Write and graph linear equations in point-slope form. Analyze different forms of a line to interpret the slope and y-intercept of a linear model in the context of data. | F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs. * | 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 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). |

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| | | | | Construct a function given an arithmetic or geometric sequence or a description of one. |
| | | | S.ID.C.5: Interpret the rate of change and the constant term of a linear model in the context of data.* | Interpret the rate of change of a linear model in the context of the data. Interpret the constant term of a linear model in the context of the data. |
| 12 | 2-3 Standard Form | Write and graph linear equations in standard form. Use linear equations in standard form to interpret the x- and y-intercepts in the context of given data. | A.CED.A.2: Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.* | Create and solve a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. Graph a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. Make predictions using the graph of a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. |
| | | | A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.* | Write an equation or inequality that models the constraint on a variable given a contextual situation. Write a system of equations or inequalities that models the constraint on a variable given a contextual situation. Explain constraints on a variable in context of a real-world situation. Justify solutions that model real-world situation when there are limitations on a variable. Interpret solutions as viable or nonviable options in a contextual situation. |
| 13 | 2.4 Parallel and Perpendicular Lines | Write equations to represent lines that are parallel or perpendicular to a given line. Graph lines to show an understanding of the relationship between the slopes of parallel and perpendicular lines. Solve real-world problems that involve parallel or perpendicular lines. | A.CED.A.2: Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.* | Create and solve a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. Graph a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. Make predictions using the graph of a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. |
| 14 | Review | | | |
| 15 | Test | | | |
| 16 | 3-1 Relations and Functions | Understand that a relation is a function if each element of the domain is assigned to exactly one element of the range. Determine a reasonable domain and identify constraints on the domain. | F.IF.A.1: Understand that a function from one set (called the domain) to another set (called the | 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). |

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| | | | 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 | Determine a reasonable domain and identify constraints on the domain. |
| 17 | 3-2 Linear Functions | Write and evaluate linear functions using function notation. Graph a linear function and relate the domain of a function to its graph. Interpret function in terms of a context. | <p>N.Q.A.1.b: Use units as a way to understand real-world problems. b. Use appropriate quantities in formulas, converting units as necessary.*</p> <p>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</p> <p>F.IF.A.2.a: Use function notation.* a. Use function notation to evaluate functions for inputs in their domains, including functions of two variables.</p> <p>F.IF.A.2.b: Use function notation.* b. Interpret statements that use function notation in terms of a context.*</p> | <p>Make observations about extraneous information embedded in context and explain why information is extraneous in a real-world problem.</p> <p>Choose an appropriate level of accuracy, including appropriate units, when reporting quantities in a real-world context.</p> <p>Explain the reasonableness of answers with respect to the context of the problem when reporting quantities as a result of solving the contextual problem.</p> <p>Describe the most common causes of inaccuracies in contextual problems (e.g., when using measurement tools).</p> <p>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).</p> <p>Explain the meaning of a function using correct mathematical vocabulary.</p> <p>Given a function that represents a real-world problem, determine what each variable represents.</p> <p>Given a function that represents a real-world problem, interpret the meaning of output values when given input values and vice versa.</p> <p>Use multiple representations to model a function in a real-world situation.</p> <p>Given a function that represents a real-world problem, determine what each variable represents.</p> <p>Given a function that represents a real-world problem, interpret the meaning of output values when given input values and vice versa.</p> <p>Use multiple representations to model a function in a real-world situation.</p> |

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| | | | <p>F.IF.B.5: Relate the domain of a function to its graph and, where applicable, to the context of the function it models. *</p> | <p>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.</p> |
| | | | <p>F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs. *</p> | <p>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 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.</p> |
| | | | <p>F.LE.B.3: Interpret the parameters in a linear or exponential function in terms of a context. *</p> | <p>Explain the meaning of the slope and y-intercept in context of the real-world situation, given a linear function. Explain the meaning of the coefficient, the base, and the exponent in context of the real-world situation, given an exponential function with a domain in the integers. Predict and determine how a linear function is affected by a change in the slope or y-intercept. 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.</p> |
| <p>18</p> | <p>3-3 Transforming Linear Functions</p> | <p>Graph transformations of linear functions by multiplying or adding specific values of k to the input or output. Interpret key features of the graph of a transformation of a linear function.</p> | <p>F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data. *</p> | <p>Graph a linear function by hand and using technology and identify the slope and Graph a quadratic function by hand and using technology identifying intercepts, maxima, and Graph an absolute value function by hand and using technology. Attend to precision when illustrating intercepts, maxima, and minima and</p> |
| | | | <p>F.BF.A.1: Build a function that describes a relationship between two quantities.</p> | <p>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 functions.</p> |

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| | | | <p>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 graphs.</p> | <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(kx)$.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $kf(x)$.</p> <p>Describe the effects on a graph for more than one transformation using specific values of a, h, and k given two functions, $f(x)$ and $af(x + h) + k$.</p> <p>Determine the value of k for vertical and horizontal translations, stretches, and compressions, given the graphs of the image and pre-image.</p> |
| 19 | Test | | | |
| 20 | 3-4 Arithmetic Sequences | Write arithmetic and geometric sequences both recursively and with an explicit formula. Use explicit formulas and recursive formulas to model real-world situations. Translate between explicit and recursive formulas. | <p>F.BF.A.1.a: Build a function that describes a relationship between two quantities.* a. Determine steps for calculation, a recursive process, or an explicit expression from a context.*</p> <p>F.LE.A.1.b: Distinguish between situations that can be modeled with linear functions and with exponential functions.* b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.*</p> <p>F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*</p> | <p>Write a function defined by an expression to model a linear relationship, given a real-world context.</p> <p>Write a function defined by an expression to model an exponential relationship with domain in the integers, given a real-world context.</p> <p>Compare key characteristics of real-world contexts that can be described by various types of functions.</p> <p>Know that linear functions have a constant rate of change, while exponential functions do not.</p> <p>Show informally or explain that linear functions grow by adding the same number per unit.</p> <p>Show informally or explain that exponential functions grow by multiplying by the same factor per unit.</p> <p>Determine if a given real-world situation has a constant rate per unit interval and can be modeled by a linear function.</p> <p>Determine if a given real-world situation has a constant factor per unit interval and can be modeled by an exponential function.</p> <p>Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay.</p> <p>Construct a linear function given a graph.</p> <p>Construct a linear function given a table of values.</p> <p>Construct a linear function given a description of a simple real-world relationship.</p> <p>Construct a linear function given a set of input-output pairs (ordered pairs).</p> <p>Construct an exponential function given a graph.</p> <p>Construct an exponential function given a table of values.</p> |

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| | | | | 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. |
| 21 | 3-5 Scatter Plots and Lines of Fit | Fit a function to linear data shown in a scatter plot and use fitted functions to solve problems in the context of the data. Interpret the slope of a trend line within the context of data. | S.ID.B.4: Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.* S.ID.C.5: Interpret the rate of change and the constant term of a linear model in the context of data.* | Represent data from two quantitative variables on a scatter plot and describe how the variables are related. Fit a function (linear, exponential, quadratic) to a given set of data. Use a linear, quadratic, or exponential function fitted to data to solve problems in the context of the data. Recognize that extrapolation may be unreliable for making predictions. Interpret the rate of change of a linear model in the context of the data. Interpret the constant term of a linear model in the context of the data. |
| 22 | 3-6 Analyzing Lines of Fit | Compute and interpret the correlation coefficient | S.ID.B.4: Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.* S.ID.C.6: Use technology to compute the correlation coefficient of a linear model; interpret the correlation coefficient in the context of the data.* S.ID.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.* | Represent data from two quantitative variables on a scatter plot and describe how the variables are related. Fit a function (linear, exponential, quadratic) to a given set of data. Use a linear, quadratic, or exponential function fitted to data to solve problems in the context of the data. Recognize that extrapolation may be unreliable for making predictions. Calculate the correlation coefficient of a linear model using technology. Interpret the correlation coefficient of a linear model in the context of the data. Explain the differences 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. Recognize situations where an additional factor may be impacting correlated data. |
| 23 | Test | | | |

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| 24 | 4-1 Solving Systems of Equations by Graphing | Graph linear systems of equations in two variables to find and approximate solution. Write a system of linear equations in two variables to represent real-world problems. | <p>A.REI.C.4: Write and solve a system of linear equations in real-world context.*</p> <p>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).</p> | <p>Solve a system of linear equations in two unknowns algebraically using the substitution method.</p> <p>Solve a system of linear equations in two unknowns algebraically using the elimination method.</p> <p>Write and solve a system of linear equations in two unknowns given a real-world context.</p> <p>Interpret the solution of a system of linear equations in two unknowns in relationship to a context.</p> <p>Find a set of solutions that can be used to create the graph, given an equation. Interpret the graph of an equation as the solution set to the equation with two variables.</p> <p>Interpret the graph of an equation as the solution set to the equation with two variables.</p> <p>Understand how the coordinates of the points on a graph are related to a given equation.</p> <p>Explain the relationship between the graphical representation and the solutions (ordered pairs) to the equation, given a real-world situation.</p> |
| 25 | 4-2 Solving Systems of Equations by Substitution | Use the substitution method to solve systems of equations. Represent situations as viable/nonviable options for the situation. | <p>A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.*</p> <p>A.REI.C.4: Write and solve a system of linear equations in real-world context.*</p> | <p>Write an equation or inequality that models the constraint on a variable given a contextual situation.</p> <p>Write a system of equations or inequalities that models the constraint on a variable given a contextual situation.</p> <p>Explain constraints on a variable in context of a real-world situation.</p> <p>Justify solutions that model real-world situation when there are limitations on a variable.</p> <p>Interpret solutions as viable or nonviable options in a contextual situation.</p> <p>Solve a system of linear equations in two unknowns algebraically using the substitution method.</p> <p>Solve a system of linear equations in two unknowns algebraically using the elimination method.</p> <p>Write and solve a system of linear equations in two unknowns given a real-world context.</p> <p>Interpret the solution of a system of linear equations in two unknowns in relationship to a context.</p> |
| 25.5 | 4-3 Solving Systems of Equations by Elimination | Solve systems of linear equations by elimination and prove that the sum of one equation and multiple of the other produces a system with the same solutions as the original system. Represent constraints with a system of equations in a modeling context. | A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.* | <p>Write an equation or inequality that models the constraint on a variable given a contextual situation.</p> <p>Write a system of equations or inequalities that models the constraint on a variable given a contextual situation.</p> <p>Explain constraints on a variable in context of a real-world situation.</p> <p>Justify solutions that model real-world situation when there are limitations on a variable.</p> |

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| | | | | Interpret solutions as viable or nonviable options in a contextual situation. |
| | | | A.REI.C.4: Write and solve a system of linear equations in real-world context.* | Solve a system of linear equations in two unknowns algebraically using the substitution method. Solve a system of linear equations in two unknowns algebraically using the elimination method. Write and solve a system of linear equations in two unknowns given a real-world context. |
| | | | | Interpret the solution of a system of linear equations in two unknowns in relationship to a context. |
| 26 | 4-4 Linear Inequalities in Two Variables | Graph solutions to linear inequalities in two variables. Represent constraints with inequalities and interpret solutions as viable or nonviable options in a modeling context. | A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.* | Write an equation or inequality that models the constraint on a variable given a contextual situation. Write a system of equations or inequalities that models the constraint on a variable given a contextual situation. Explain constraints on a variable in context of a real-world situation. Justify solutions that model real-world situation when there are limitations on a variable. Interpret solutions as viable or nonviable options in a contextual situation. |
| | | | A.REI.D.7: 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. |
| 27 | 4-5 Systems of Linear Inequalities | Graph the solution set of a system of linear inequalities in two variables. Interpret solutions of linear inequalities in a modeling context. | A.CED.A.3: Create individual and systems of equations and/or inequalities to represent constraints in a contextual situation, and interpret solutions as viable or non-viable.* | Write an equation or inequality that models the constraint on a variable given a contextual situation. Write a system of equations or inequalities that models the constraint on a variable given a contextual situation. Explain constraints on a variable in context of a real-world situation. Justify solutions that model real-world situation when there are limitations on a variable. Interpret solutions as viable or nonviable options in a contextual situation. |
| | | | A.REI.D.7: 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. |
| 28 | Test | | | |

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| 29 | 5-1 The Absolute Value Function | Graph an absolute value function and identify the key features of the graph. Calculate and interpret the rate of change of an absolute value function over a specified interval. | <p>F.IF.B.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.*</p> | <p>Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with integer exponents.</p> <p>Identify all evident key features when provided a table of values representing a linear, quadratic, exponential or absolute value function.</p> <p>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.</p> <p>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.</p> <p>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 of an exponential function with domain in the integers embedded in a real-world context.</p> <p>Sketch a graph of the function, given a verbal description of the key features of a quadratic function, absolute value function and an exponential function with integer exponents.</p> |
| | | | <p>F.IF.B.6: Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph.*</p> | <p>Calculate the average rate of change when given an equation or table of a quadratic, absolute value, piecewise, or exponential function, where exponential functions are limited to domains in the integers.</p> <p>Interpret the average rate of change of a quadratic, absolute value, piecewise, or exponential function, where exponential functions are limited to domains in the integers.</p> <p>Estimate the average rate of change for a specific interval of a quadratic, absolute value, piecewise, or exponential function when given a graph, where exponential functions are limited to domains in the integers.</p> |
| | | | <p>F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.*</p> | <p>Graph a linear function by hand and using technology and identify the slope and intercepts.</p> <p>Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima.</p> <p>Graph an absolute value function by hand and using technology.</p> <p>Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.</p> |

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| | | | <p>F.IF.C.9.b: A1.F.IF.C.9 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.* b.Compare properties of the same function on two different intervals or represented in two different ways.*</p> | <p>Compare properties of two exponential functions each represented in a different way.</p> <p>Compare properties of two absolute value functions each represented in a different way.</p> <p>Compare properties of two quadratic functions each represented in a different way.</p> <p>Compare properties of two functions from different function families each represented in a different way.</p> <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> |
| 30 | 8-1 Key Features of Graphs of Quadratic Functions | Identify key features of the graph of a quadratic function using graphs, tables, and equations. Explain the effect of the value of a on the quadratic parent function. | <p>A.CED.A.2: Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.*</p> <p>F.IF.B.6: Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph.*</p> <p>F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.*</p> <p>F.BF.B.2: Identify the effect on the graph of replacing</p> | <p>Create and solve a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context.</p> <p>Graph a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context.</p> <p>Make predictions using the graph of a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context</p> <p>Calculate the average rate of change when given an equation or table of a quadratic, absolute value, piecewise, or exponential function, where exponential functions are limited to domains in the integers.</p> <p>Interpret the average rate of change of a quadratic, absolute value, piecewise, or exponential function, where exponential functions are limited to domains in the integers</p> <p>Estimate the average rate of change for a specific interval of a quadratic, absolute value, piecewise, or exponential function when given a graph, where exponential functions are limited to domains in the integers.</p> <p>Graph a linear function by hand and using technology and identify the slope and intercepts.</p> <p>Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima.</p> <p>Graph an absolute value function by hand and using technology.</p> <p>Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$.</p> |

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| | | | <p>$f(x)$ 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 graphs.</p> | <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$.</p> <p>Describe the effect on the graph for specific values of k, given two $(x)(kx)$.</p> <p>Describe the effect on the graph for specific values of k, given two (x) and $kf(x)$.</p> <p>Describe the effects on a graph for more than one transformation using specific values of a, h, and k given two functions, $f(x)$ and $af(x+h)+k$.</p> <p>Determine the value of k for vertical and horizontal translations, stretches, and compressions, given the graphs of the image and pre-image.</p> |
| 31 | 8-2 Quadratic Functions in Vertex Form | Identify key features of the graph of quadratic functions written in vertex form. Graph quadratic functions in vertex form. | <p>F.IF.C.9.b: A1.F.IF.C.9 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.* b. Compare properties of the same function on two different intervals or represented in two different ways.*</p> <p>F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.*</p> <p>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 graphs.</p> <p>F.IF.C.9.b: A1.F.IF.C.9 Compare properties of functions represented algebraically,</p> | <p>Compare properties of two exponential functions each represented in a different way.</p> <p>Compare properties of two absolute value functions each represented in a different way.</p> <p>Compare properties of two quadratic functions each represented in a different way.</p> <p>Compare properties of two functions from different function families each represented in a different way.</p> <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> <p>Graph a linear function by hand and using technology and identify the slope and</p> <p>Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima.</p> <p>Graph an absolute value function by hand and using technology.</p> <p>Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.</p> <p>Describe the effect on the graph for specific values of k, given two $(x)(x) + k$.</p> <p>Describe the effect on the graph for specific values of k, given two $(x)(x + k)$.</p> <p>Describe the effect on the graph for specific values of k, given two $(x)(kx)$.</p> <p>Describe the effect on the graph for specific values of k, given two (x) and $kf(x)$.</p> <p>Describe the effects on a graph for more than one transformation using specific values of a, two functions, $f(x)(x+h)+k$.</p> <p>Determine the value for vertical and horizontal translations, stretches, and compressions, given the graphs of the image and pre-image.</p> <p>Compare properties of two exponential functions each represented in a different way.</p> <p>Compare properties of two absolute value functions each represented in a different way.</p> |

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| | | | graphically, numerically in tables, or by verbal descriptions.* b.Compare properties of the same function on two different intervals or represented in two different ways.* | <p>Compare properties of two quadratic functions each represented in a different way</p> <p>Compare properties of two functions from different function families each represented in a different way.</p> <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> |
| 32 | 8-3 Quadratic Functions in Standard Form | Graph quadratic functions in standard form and show intercepts, maxima, and minima. Determine how the values of a, b, and c affect the graph of $f(x) = ax^2 + bx + c$. Identify key features of parabolas. Compare properties of quadratic functions presented in different forms (algebraically, in a table, graphically). | F.IF.B.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.* | <p>Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with integer exponents.</p> <p>Identify all evident key features when provided a table of values representing a linear, quadratic, exponential or absolute value function.</p> <p>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.</p> <p>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.</p> <p>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 of an exponential function with domain in the integers embedded in a real-world context.</p> <p>Sketch a graph of the function, given a verbal description of the key features of a quadratic function, absolute value function and an exponential function with integer exponents.</p> |
| | | | F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.* | <p>Graph a linear function by hand and using technology and identify the slope and intercepts.</p> <p>Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima.</p> <p>Graph an absolute value function by hand and using technology.</p> <p>Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.</p> |
| | | | F.IF.C.8.a: Write a function defined by an expression in different but equivalent forms to | <p>Rewrite quadratic functions in different but equivalent forms.</p> <p>Interpret the meaning of zeros, extreme values, and symmetry of the graph in the context of a real-world problem.</p> |

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| | | | <p>reveal and explain different properties of the function. *a. Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a</p> | <p>Recognize which form of a quadratic function is most appropriate for revealing certain properties, when given a real-world problem.</p> |
| | | | <p>F.IF.C.9.a: Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.*</p> | <p>Compare properties of two exponential functions each represented in a different way..</p> |
| | | | <p>a.Compare properties of two different functions. Functions may be of different types and/or represented in different ways.*</p> | <p>Compare properties of two absolute value functions each represented in a different way.</p> |
| | | | <p>F.IF.C.9.b:</p> | <p>Compare properties of two quadratic functions each represented in a different way.</p> |
| | | | <p>A1.F.IF.C.9 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.*</p> | <p>Compare properties of two functions from different function families each represented in a different way.</p> |
| | | | <p>b.Compare properties of the same function on two different intervals or represented in two different ways.*</p> | <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> |
| | | | <p>F.IF.A.2.a:</p> | <p>Compare properties of two exponential functions each represented in a different way..</p> |
| | | | <p>A1.F.IF.A.2 Use function notation.*</p> | <p>Compare properties of two absolute value functions each represented in a different way.</p> |
| | | | <p>a. Use function notation to evaluate functions for inputs in their domains, including functions of two variables.*</p> | <p>Compare properties of two quadratic functions each represented in a different way.</p> |
| | | | <p>F.BF.A.1: Build a function that describes a relationship between two quantities.*</p> | <p>Compare properties of two functions from different function families each represented in a different way.</p> |
| | | | | <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> |
| 33 | 8-4 Modeling with Quadratic Functions | Use quadratic functions fitted to data to model real-world situations. Use the vertical motion model to write an equation. Compare a model to a data set by analyzing and evaluating residuals. | <p>F.IF.A.2.a:</p> | <p>Given a function that represents a real-world problem, determine what each variable represents.</p> |
| | | | <p>A1.F.IF.A.2 Use function notation.*</p> | <p>Given a function that represents a real-world problem, interpret the meaning of output values when given input values and vice versa.</p> |
| | | | <p>a. Use function notation to evaluate functions for inputs in their domains, including functions of two variables.*</p> | <p>Use multiple representations to model a function in a real-world situation.</p> |
| | | | <p>F.BF.A.1: Build a function that describes a relationship between two quantities.*</p> | <p>Write a function defined by an expression to model a linear relationship, given a real-world context.</p> |
| | | | | <p>Write a function defined by an expression to model an exponential relationship with domain in the integers, given a real-world context.</p> |
| | | | | <p>Compare key characteristics of real-world contexts that can be described by various types of functions.</p> |

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| | | | S.ID.B.4: Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data.* | <p>Represent data from two quantitative variables on a scatter plot and describe how the variables are related.</p> <p>Fit a function (linear, exponential, quadratic) to a given set of data.</p> <p>Use a linear, quadratic, or exponential function fitted to data to solve problems in the context of the data.</p> <p>Recognize that extrapolation may be unreliable for making predictions.</p> |
| 34 | 6-2 Exponential Functions | Sketch graphs showing key features of exponential functions. Write exponential functions using tables and graphs. Compare linear and exponential functions. | <p>N.Q.A.1.a: Use units as a way to understand real-world problems.* a. Choose and interpret the scale and the origin in graphs and data displays,</p> <p>F.IF.B.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.*</p> <p>F.IF.B.5: Relate the domain of a</p> | <p>Make observations about extraneous information embedded in context and explain why information is extraneous in a real-world problem.</p> <p>Choose an appropriate level of accuracy, including appropriate units, when reporting quantities in a real-world context.</p> <p>Explain the reasonableness of answers with respect to the context of the problem when reporting quantities as a result of solving the contextual problem.</p> <p>Describe the most common causes of inaccuracies in contextual problems (e.g., when using measurement tools).</p> <p>Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with integer exponents.</p> <p>Identify all evident key features when provided a table of values representing a linear, quadratic, exponential or absolute value function.</p> <p>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.</p> <p>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.</p> <p>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 of an exponential function with domain in the integers embedded in a real-world context.</p> <p>Sketch a graph of the function, given a verbal description of the key features of a quadratic function, absolute value function and an exponential function with integer exponents.</p> <p>Explain how the domain relates to the graph of a function.</p> |

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| | | | function to its graph and, where applicable, to the context of the function it models.* | <p>Explain why a function is continuous or discrete given an equation.</p> <p>Describe how a function's domain is affected when situated within a context.</p> <p>Explain if a function is continuous or discrete, given a context.</p> |
| | | | F.IF.C.9.b: A1.F.IF.C.9 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.* | <p>Compare properties of two exponential functions each represented in a different way.</p> <p>Compare properties of two absolute value functions each represented in a different way.</p> <p>Compare properties of two quadratic functions each represented in a different way.</p> |
| | | | b. Compare properties of the same function on two different intervals or represented in two different ways.* | <p>Compare properties of two functions from different function families each represented in a different way.</p> <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> |
| | | | F.LE.A.1: Distinguish between situations that can be modeled with linear functions and with exponential functions.* | <p>Know that linear functions have a constant rate of change, while exponential functions do not.</p> <p>Show informally or explain that linear functions grow by adding the same number per unit.</p> <p>Show informally or explain that exponential functions grow by multiplying by the same factor per unit.</p> <p>Determine if a given real-world situation has a constant rate per unit interval and can be modeled by a linear function.</p> <p>Determine if a given real-world situation has a constant factor per unit interval and can be modeled by an exponential function.</p> <p>Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay.</p> |
| | | | F.LE.A.1.a * a. Know that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.* | <p>Know that linear functions have a constant rate of change, while exponential functions do not.</p> <p>Show informally or explain that linear functions grow by adding the same number per unit.</p> <p>Show informally or explain that exponential functions grow by multiplying by the same factor per unit.</p> <p>Determine if a given real-world situation has a constant rate per unit interval and can be modeled by a linear function.</p> <p>Determine if a given real-world situation has a constant factor per unit interval and can be modeled by an exponential function.</p> <p>Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay.</p> |
| 35 | 6-3 Exponential Growth and Decay | Construct exponential growth and decay functions given a description of a relationship. Recognize if a situation can be modeled with exponential growth or exponential decay, and | A.SSE.A.1.a: Interpret expressions that represent a quantity | 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 the parameters of the model in context.

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| <p>in terms of its context.*a. Interpret parts of an expression, such as terms, factors, and coefficients.*</p> | <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.</p> <p>Interpret an expression by describing each individual term as a single entity and the relationship to the expression.</p> |
| <p>A.SSE.A.1.b: Interpret expressions that represent a quantity in terms of its context.* b. Interpret complicated expressions by viewing one or more of their parts as a single entity.*</p> | <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.</p> <p>Interpret an expression by describing each individual term as a single entity and the relationship to the expression.</p> |
| <p>A.CED.A.2: Create equations in two variables to represent relationships between quantities and use them to solve problems in a real-world context. Graph equations with two variables on coordinate axes with labels and scales, and use the graphs to make predictions.*</p> | <p>Create and solve a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. Graph a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context. Make predictions using the graph of a two-variable linear, quadratic, or absolute value equation or inequality that represents a real-world context.</p> |
| <p>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 approximate solutions by graphing the functions or making a table of values, using technology when appropriate.*</p> | <p>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 $f(x) = g(x)$. Approximate the solution(s) for $f(x) = g(x)$ by graphing, making a table of values or using technology. Approximate the solution(s) for $f(x) = g(x)$ when $f(x)$ and $g(x)$ are linear, quadratic, absolute value or exponential, given two equations $f(x)$ and $g(x)$.</p> |

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| F.IF.B.6: Calculate and interpret the average rate of change of a function (presented algebraically or as a table) over a specified interval. Estimate and interpret the rate of change from a graph.* | Calculate the average rate of change when given an equation or table of a quadratic, absolute value, piecewise, or exponential function, where exponential functions are limited to domains in the integers. |
| | Interpret the average rate of change of a quadratic, absolute value, piecewise, or exponential function, 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, piecewise, or exponential function when given a graph, where exponential functions are limited to domains in the integers. |
| F.LE.A.1.c: Distinguish between situations that can be modeled with linear functions and with exponential functions.* c. Recognize situations in which a quantity grows or decays by a constant factor per unit interval relative to another.* | Know that linear functions have a constant rate of change, while exponential functions do not. |
| | Show informally or explain that linear functions grow by adding the same number per unit. |
| | Show informally or explain that exponential functions grow by multiplying by the same factor per unit. |
| | Determine if a given real-world situation has a constant rate per unit interval and can be modeled by a linear function. |
| | Determine if a given real-world situation has a constant factor per unit interval and can be modeled by an exponential function. |
| F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.* | Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay. |
| | 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 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. | |
| F.LE.B.3: Interpret the parameters in a linear or exponential function in terms of a context.* | Explain the meaning of the slope and y-intercept in context of the real-world situation, given a linear function. |
| | Explain the meaning of the coefficient, the base, and the exponent in context of the real-world situation, given an exponential function with a domain in the integers. |

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| | | | | <p>Predict and determine how a linear function is affected by a change in the slope or y-intercept. Explain this change in context.</p> <p>Predict and determine how an exponential function is affected by a change in the coefficient, base, or exponent. Explain this change in context.</p> |
| | | | <p>N.Q.A.1.d: Use units as a way to understand real-world problems.* d. Choose an appropriate level of accuracy when reporting quantities.*</p> | <p>Make observations about extraneous information embedded in context and explain why information is extraneous in a real-world problem.</p> <p>Choose an appropriate level of accuracy, including appropriate units, when reporting quantities in a real-world context.</p> <p>Explain the reasonableness of answers with respect to the context of the problem when reporting quantities as a result of solving the contextual problem.</p> <p>Describe the most common causes of inaccuracies in contextual problems (e.g., when using measurement tools).</p> |
| | | | <p>F.IF.C.9.b: A1.F.IF.C.9 Compare properties of functions represented algebraically, graphically, numerically in tables, or by verbal descriptions.* b. Compare properties of the same function on two different intervals or represented in two different ways.*</p> | <p>Compare properties of two exponential functions each represented in a different way.</p> <p>Compare properties of two absolute value functions each represented in a different way.</p> <p>Compare properties of two quadratic functions each represented in a different way.</p> <p>Compare properties of two functions from different function families each represented in a different way.</p> <p>Compare properties of the same function on two different intervals or represented in two different ways.</p> |
| 36 | 6-4 Geometric Sequences | Find explicit and recursive formulas for geometric sequences. Translate between recursive and explicit formulas for geometric sequences. Construct exponential functions to represent geometric sequences. | <p>F.BF.A.1.a: Build a function that describes a relationship between two quantities.* a. Determine steps for calculation, a recursive process, or an explicit expression from a context.*</p> <p>F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a table, a description of a relationship, or input-output pairs.*</p> | <p>Write a function defined by an expression to model a linear relationship, given a real-world context.</p> <p>Write a function defined by an expression to model an exponential relationship with domain in the integers, given a real-world context.</p> <p>Compare key characteristics of real-world contexts that can be described by various types of functions.</p> <p>Construct a linear function given a graph.</p> <p>Construct a linear function given a table of values.</p> <p>Construct a linear function given a description of a simple real-world relationship.</p> <p>Construct a linear function given a set of input-output pairs (ordered pairs).</p> <p>Construct an exponential function given a graph.</p> <p>Construct an exponential function given a table of values.</p> |

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| | | | | 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. |
| 37 | 8-5 Comparing Linear, Exponential, and Quadratic Models | Use mathematical modeling to represent a problem situation and to propose a solution. Test and verify the appropriateness of their math models. Explain why the results from their mathematical models might not align exactly with the problem situation. | F.LE.A.1.a: Distinguish between situations that can be modeled with linear functions and with exponential functions.* a.Know that linear functions grow by equal differences over equal intervals and that exponential functions grow by equal factors over equal intervals.* | <p>Know that linear functions have a constant rate of change, while exponential functions do not.</p> <p>Show informally or explain that linear functions grow by adding the same number per unit.</p> <p>Show informally or explain that exponential functions grow by multiplying by the same factor per unit.</p> <p>Determine if a given real-world situation has a constant rate per unit interval and can be modeled by a linear function.</p> <p>Determine if a given real-world situation has a constant factor per unit interval and can be modeled by an exponential function.</p> <p>Determine if a given real-world situation that can be modeled by an exponential function represents growth or decay.</p> |
| | | | S.ID.B.4: Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. | <p>Know that linear functions have a constant rate of change, while exponential functions do not.</p> <p>Show informally or explain that linear functions grow by adding the same number per unit.</p> <p>Show informally or explain that exponential functions grow by multiplying by the same factor per unit.</p> <p>Determine if a given real-world situation has a constant rate per unit interval and can be modeled by a linear function.</p> |
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| 39 | Mid Terms | | | |
| 40 | Mid Terms | | | |
| 41 | 7-1 Adding and Subtracting Polynomials | Identify the parts of a polynomial, such as coefficients, variables, and constants. Classify polynomials by number of terms and by degree. Write a polynomial in standard form. Add or subtract two polynomials and recognize that polynomials are closed under addition and subtractions, similar to integers. | A.APR.A.1: Add, subtract, and multiply polynomials. Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers. | <p>Add polynomial expressions</p> <p>Subtract two polynomial expressions.</p> <p>Multiply polynomial expressions.</p> <p>Explain what it means for polynomials to be closed under the operations of addition, subtraction, and multiplication.</p> |
| 42 | 7-2 Multiplying Polynomials | Use the Distributive Property with polynomials, recognizing that polynomials are closed under multiplication. Multiply | A.APR.A.1: Add, subtract, and multiply | <p>Add polynomial expressions.</p> <p>Subtract two polynomial expressions.</p> <p>Multiply polynomial expressions.</p> |

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| | | polynomials using a table and area model. Apply the product of polynomials to solve real-world problems. | polynomials. Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers. | Explain what it means for polynomials to be closed under the operations of addition, subtraction, and multiplication. |
| 43 | 7-3 Multiplying Special Cases | Determine the square of a binomial. Find the product of sum and difference of two squares. Solve real-world problems involving square of a binomial. | A.APR.A.1: Add, subtract, and multiply polynomials. Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers. | <p>Add polynomial expressions.</p> <p>Subtract two polynomial expressions.</p> <p>Multiply polynomial expressions.</p> <p>Explain what it means for polynomials to be closed under the operations of addition, subtraction, and multiplication.</p> |
| 44 | 7-4 Factoring Polynomials | Factor polynomials in the form of $x^2 + bx + c$ by finding two binomial factors whose product is equal to the trinomial. Identify patterns in the signs of the coefficients of the terms of a trinomial expressions and use those patterns to determine the sign of the second terms in the binomial factors. | A.SSE.A.1.a: Interpret expressions that represent a quantity in terms of its context.*a. Interpret parts of an expression, such as terms, factors, and coefficients.* | <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.</p> <p>Interpret parts of an expression (i.e., term, factor, and coefficient) and explain each part in terms of the function the expression defines</p> <p>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.</p> <p>Interpret an expression by describing each individual term as a single entity and the relationship to the expression</p> |
| 45 | 7-5 Factoring $x^2 + bx + c$ | Factor a trinomial in the form of $x^2 + bx + c$ by finding two binomial factors whose product is equal to the trinomial. Identify patterns in the signs of the coefficients of the terms of a trinomial expression and use those patterns to determine the signs of the second terms in the binomial factors. Factor trinomials in the context of solving real-world problems. | A.SSE.A.1.a: Interpret expressions that represent a quantity in terms of its context.*a. Interpret parts of an expression, such as terms, factors, and coefficients.* | <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.</p> <p>Interpret parts of an expression (i.e., term, factor, and coefficient) and explain each part in terms of the function the expression defines</p> <p>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.</p> <p>Interpret an expression by describing each individual term as a single entity and the relationship to the expression</p> |
| 46 | 7-6 Factoring $ax^2 + bx + c$ | Identify the common factor of the coefficients in the terms of a trinomial expression when a is not equal to 1. Write a quadratic trinomial as a product of two binomial factors. | A.SSE.A.1.a: Interpret expressions that represent a quantity in terms of its context.*a. Interpret parts of an expression, such as | <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.</p> <p>Interpret parts of an expression (i.e., term, factor, and coefficient) and explain each part in terms of the function the expression defines</p> |

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| | | | terms, factors, and coefficients.* | <p>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.</p> <p>Interpret an expression by describing each individual term as a single entity and the relationship to the expression</p> |
| 47 | 7-7 Factoring Special Cases | Identify and factor a trinomial that is a perfect square or a binomial that is a difference of two squares. Use a polynomial to represent a measurement in a real-world situation and describe how a factored form of the polynomial relates to that situation. | A.SSE.A.1.a: Interpret expressions that represent a quantity in terms of its context.*a. Interpret parts of an expression, such as terms, factors, and coefficients.* | <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.</p> <p>Interpret parts of an expression (i.e., term, factor, and coefficient) and explain each part in terms of the function the expression defines</p> <p>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.</p> <p>Interpret an expression by describing each individual term as a single entity and the relationship to the expression</p> |
| 48 | Test | | | |
| 49 | 9-1 Solving Quadratic Equations Using Graphs and Tables | Use a graph to identify the x-intercepts as solutions of a quadratic equation. Use a graphing calculator to make a table of values to approximate or solve a quadratic equation. | A.APR.A.1: Add, subtract, and multiply polynomials. Use these operations to demonstrate that polynomials form a closed system that adhere to the same properties of operations as the integers. | <p>Solve a quadratic equation in one variable by inspection or taking square roots.</p> <p>Know and apply the quadratic formula to solve a quadratic equation in one variable.</p> <p>Use factoring to solve a quadratic equation in one variable.</p> <p>Recognize when a quadratic equation in one-variable has real solutions or nonreal solutions.</p> <p>Use the graph of the related quadratic equation to solve a simple quadratic inequality in one variable.</p> |
| 50 | 9-2 Solving Quadratic Equations by Factoring | Use the Zero-Product Property and factoring to find the solutions of a quadratic equation. Apply factoring to solve real-world problems. Use the zeros to sketch a graph. Write the factored form of a quadratic function from a graph. | A.REI.B.3a: A1.A.REI.B.3 Solve quadratic equations and inequalities in one variable.a. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutions that are not real numbers. | <p>Solve a quadratic equation in one variable by inspection or taking square roots.</p> <p>Know and apply the quadratic formula to solve a quadratic equation in one variable.</p> <p>Use factoring to solve a quadratic equation in one variable.</p> <p>Recognize when a quadratic equation in one-variable has real solutions or nonreal solutions.</p> <p>Use the graph of the related quadratic equation to solve a simple quadratic inequality in one variable.</p> |

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| | | | F.IF.C.8.a: Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. *a. Rewrite quadratic functions to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a | Rewrite quadratic functions in different but equivalent forms. Interpret the meaning of zeros, extreme values, and symmetry of the graph in the context of a real-world problem. Recognize which form of a quadratic function is most appropriate for revealing certain properties, when given a real-world problem. |
| 51 | 9-3 Rewriting Radical Expressions | Use properties of exponents to rewrite radical expressions. Multiply radical expressions. Write a radical expression to model or represent a real-world problem. | A.SSE.A.1.a: Interpret expressions that represent a quantity in terms of its context.*a. Interpret parts of an expression, such as terms, factors, and coefficients.* | 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. |
| | | | A.SSE.A.1.b: Interpret expressions that represent a quantity in terms of its context.* b. Interpret complicated expressions by viewing one or more of their parts as a single entity.* | 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. |
| 52 | 9-4 Solving Quadratic Equations Using Square Roots | Solve quadratic equations by finding square roots. Determine reasonable solutions for real-world problems. | A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-world context.* | Create and solve a one-variable linear, quadratic, or absolute value 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 absolute value inequality that represents a simple real-world situation. |
| | | | A.REI.B.3a: A1.A.REI.B.3 Solve quadratic equations and inequalities in one variable. a. Solve quadratic | Solve a quadratic equation in one variable by inspection or taking square roots. Know and apply the quadratic formula to solve a quadratic equation in one variable. |

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| | | | <p>equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutions that are not real numbers.</p> | <p>Use factoring to solve a quadratic equation in one variable.</p> <p>Recognize when a quadratic equation in one-variable has real solutions or nonreal solutions.</p> <p>Use the graph of the related quadratic equation to solve a simple quadratic inequality in one variable.</p> |
| 53 | 9-6 The Quadratic Formula and the Discriminant | Derive the quadratic formula. Solve quadratic equations in one variable by using the quadratic formula. Use the discriminant to determine the number and type of solutions to a quadratic equation. | <p>A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems in a real-world context.*</p> <p>A.REI.B.3a: A1.A.REI.B.3 Solve quadratic equations and inequalities in one variable. a. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutions that are not real numbers.</p> | <p>Create and solve a one-variable linear, quadratic, or absolute value equation that represents a real-world situation.</p> <p>Create and solve a one-variable linear inequality that represents a real-world situation.</p> <p>Create and solve a one-variable quadratic or absolute value inequality that represents a simple real-world situation.</p> <p>Solve a quadratic equation in one variable by inspection or taking square roots.</p> <p>Know and apply the quadratic formula to solve a quadratic equation in one variable.</p> <p>Use factoring to solve a quadratic equation in one variable.</p> <p>Recognize when a quadratic equation in one-variable has real solutions or nonreal solutions.</p> <p>Use the graph of the related quadratic equation to solve a simple quadratic inequality in one variable.</p> |
| 54 | 9-7 Solving Systems of Linear and Quadratic Equations | Describe a linear-quadratic system of equations. Solve a linear-quadratic system of equations. | <p>A.REI.B.3a: A1.A.REI.B.3 Solve quadratic equations and inequalities in one variable. a. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, knowing and</p> | <p>Solve a quadratic equation in one variable by inspection or taking square roots.</p> <p>Know and apply the quadratic formula to solve a quadratic equation in one variable.</p> <p>Use factoring to solve a quadratic equation in one variable.</p> <p>Recognize when a quadratic equation in one-variable has real solutions or nonreal solutions.</p> |

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| | | | <p>applying the quadratic formula, and factoring, as appropriate to the initial form of the equation. Recognize when a quadratic equation has solutions that are not real numbers.</p> | <p>Use the graph of the related quadratic equation to solve a simple quadratic inequality in one variable.</p> |
| | | | <p>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 approximate solutions by graphing the functions or making a table of values, using technology when appropriate.*</p> | <p>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 $f(x) = g(x)$.</p> <p>Approximate the solution(s) for $f(x) = g(x)$ by graphing, making a table of values or using technology.</p> <p>Approximate the solution(s) for $f(x) = g(x)$ when $f(x)$ and $g(x)$ are linear, quadratic, absolute value or exponential, given two equations $f(x)$ and $g(x)$.</p> |
| 55 | Test | | | |
| 56 | 11-1 Analyzing Data Displays | <p>Represent data using dot plots, box plots, and histograms. Interpret the data displayed in dot plots, box plots, and histograms within the context of the data that it represents.</p> | <p>S.ID.A.1: Use measures of center to solve real-world and mathematical problems.*</p> <p>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.*</p> | <p>Use mean, median, and mode to solve real-world and mathematical problems, including weighted averages.</p> <p>Interpret differences in shape, center, and spread of the data sets in context given a numerical data set or a visual and/or verbal description of the data.</p> <p>Describe the effect of an extreme value on the shape, center, and spread of a data set.</p> |
| 57 | 11-2 Comparing Data Sets | <p>Use measures of center to interpret and compare data sets displayed in dot plots, box plots, and histograms. Explain and account for the effect of outliers on measures of center and variability. Use measures of variability, such as MAD or IQR, to interpret and compare data sets.</p> | <p>S.ID.A.1: Use measures of center to solve real-world and mathematical problems.*</p> <p>S.ID.A.2: Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range) of two or more different data sets.*</p> | <p>Use mean, median, and mode to solve real-world and mathematical problems, including weighted averages.</p> <p>Explain similarities and differences using the mean, median, and/or mode and range and/or interquartile range of two or more data sets and describe how they relate to the shape of the data distribution.</p> <p>Given a numerical data set or a visual and/or verbal depiction of a data set, choose which measure of center and measure of spread are most appropriate to the shape of the data distribution.</p> |

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| | | | 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.* | Interpret differences in shape, center, and spread of the data sets in context given a numerical data set or a visual and/or verbal description of the data. Describe the effect of an extreme value on the shape, center, and spread of a data set. |
| 58 | 11-3 Interpreting the Shapes of Data Displays | Interpret and compare differences in shape, center, and spread of data of different sets. Determine the relationship between the mean and median of a data set when the shape of the data is evenly spread, skewed right, or skewed left. | S.ID.A.1: Use measures of center to solve real-world and mathematical problems.* | Use mean, median, and mode to solve real-world and mathematical problems, including weighted averages. |
| | | | S.ID.A.2: Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range) of two or more different data sets.* | Explain similarities and differences using the mean, median, and/or mode and range and/or interquartile range of two or more data sets and describe how they relate to the shape of the data distribution. Given a numerical data set or a visual and/or verbal depiction of a data set, choose which measure of center and measure of spread are most appropriate to the shape of the data distribution. |
| | | | 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.* | Interpret differences in shape, center, and spread of the data sets in context given a numerical data set or a visual and/or verbal description of the data. Describe the effect of an extreme value on the shape, center, and spread of a data set. |
| 59 | 11-4 Standard Deviation | Interpret differences in the variability or spread of a data set. Calculate the standard deviation of a data set and use it to compare and interpret data sets. | S.ID.A.2: Use statistics appropriate to the shape of the data distribution to compare center (mean, median, and/or mode) and spread (range, interquartile range) of two or more different data sets.* | Explain similarities and differences using the mean, median, and/or mode and range and/or interquartile range of two or more data sets and describe how they relate to the shape of the data distribution. Given a numerical data set or a visual and/or verbal depiction of a data set, choose which measure of center and measure of spread are most appropriate to the shape of the data distribution. |
| | | | 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.* | Interpret differences in shape, center, and spread of the data sets in context given a numerical data set or a visual and/or verbal description of the data. Describe the effect of an extreme value on the shape, center, and spread of a data set. |

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| 60 | 11-5 Two-Way Frequency Tables | Organize and summarize categorical data by creating two-way frequency tables. Calculate and interpret joint and marginal frequencies, joint and marginal relative frequencies, and conditional relative frequencies, and use them to make inferences about a population. | S.ID.B.4: Represent data from two quantitative variables on a scatter plot, and describe how the variables are related. Fit a function to the data; use functions fitted to data to solve problems in the context of the data | <p>Represent data from two quantitative variables on a scatter plot and describe how the variables are related.</p> <p>Fit a function (linear, exponential, quadratic) to a given set of data.</p> <p>Use a linear, quadratic, or exponential function fitted to data to solve problems in the context of the data.</p> <p>Recognize that extrapolation may be unreliable for making predictions.</p> |
| 61 | EOC Review | | | |
| | 5-2 Piecewise-Defined Functions | Understand and graph piecewise-defined functions. Analyze the key features of the graph of a piecewise-defined function to solve application problems. Write and interpret a piecewise-defined function to solve application problems. | F.IF.B.5: Relate the domain of a function to its graph and, where applicable, to the context of the function it models. * | <p>Explain how the domain relates to the graph of a function.</p> <p>Explain why a function is continuous or discrete given an equation.</p> <p>Describe how a function's domain is affected when situated within a context.</p> <p>Explain if a function is continuous or discrete, given a context.</p> |
| | 5-3 Step Functions | Graph step functions including ceiling functions and floor functions. Calculate and interpret the average rate of change of step functions. | F.IF.B.5: Relate the domain of a function to its graph and, where applicable, to the context of the function it models. * | <p>Explain how the domain relates to the graph of a function.</p> <p>Explain why a function is continuous or discrete given an equation.</p> <p>Describe how a function's domain is affected when situated within a context.</p> <p>Explain if a function is continuous or discrete, given a context.</p> |
| | 5-4 Transformations of Piecewise-Defined Functions | Graph transformations of piecewise-defined functions. Identify the effect of changing constants and coefficients of absolute value functions on their graphs. | F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.* | <p>Graph a linear function by hand and using technology and identify the slope and intercepts.</p> <p>Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima.</p> <p>Graph an absolute value function by hand and using technology.</p> <p>Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function.</p> |
| | | | 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 graphs. | Describe the effect on the graph for specific values of k , given two functions, $f(x)$ and $f(x) + k$. |
| | | | 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 graphs. | Describe the effect on the graph for specific values of k , given two functions, $f(x)$ and $f(x + k)$. |
| | | | 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 graphs. | Describe the effect on the graph for specific values of k , given two functions, $f(x)$ and $f(kx)$. |
| | | | 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 graphs. | Describe the effect on the graph for specific values of k , given two functions, $f(x)$ and $kf(x)$. |
| | | | 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 graphs. | Describe the effects on a graph for more than one transformation using specific values of a , h , and k given two functions, $f(x)$ and $af(x + h) + k$. |
| | | | 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 graphs. | Determine the value of k for vertical and horizontal translations, stretches, and compressions, given the graphs of the image and pre-image. |

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| <p>10-1 The Square Root Function</p> | <p>Graph translations of the square root function. Calculate and interpret the average rate of change for a square root function over a specified interval.</p> | <p>F.IF.B.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.*</p> | <p>Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with integer exponents.</p> <p>Identify all evident key features when provided a table of values representing a linear, quadratic, exponential or absolute value function.</p> <p>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.</p> <p>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.</p> <p>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 of an exponential function with domain in the integers embedded in a real-world context.</p> <p>Sketch a graph of the function, given a verbal description of the key features of a quadratic function, absolute value function and an exponential function with integer exponents.</p> |
| <p>10-2 The Cube Root Function</p> | <p>Identify key features of the graph of cube root functions and graph translations of them. Model real-world situations using the cube root function. Calculate and interpret the average rate of change of a cube root function over a specified interval.</p> | <p>F.IF.B.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.*</p> | <p>Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with integer exponents.</p> <p>Identify all evident key features when provided a table of values representing a linear, quadratic, exponential or absolute value function.</p> <p>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.</p> <p>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.</p> <p>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 of an exponential function with domain in the integers embedded in a real-world context.</p> |

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| | | | Sketch a graph of the function, given a verbal description of the key features of a quadratic function, absolute value function and an exponential function with integer exponents. |
| 10-3 Analyzing Functions Graphically | Relate the domain and range of a function to its graph. Analyze the key features of the graph of a function to identify the type of function it represents. | F.IF.B.4: For a function that models 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.* | <p>Identify all evident intercepts, maximums and minimums when provided a table of values representing an exponential function with integer exponents.</p> <p>Identify all evident key features when provided a table of values representing a linear, quadratic, exponential or absolute value function.</p> <p>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.</p> <p>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.</p> <p>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 of an exponential function with domain in the integers embedded in a real-world context.</p> <p>Sketch a graph of the function, given a verbal description of the key features of a quadratic function, absolute value function and an exponential function with integer exponents.</p> |
| 10-4 Translations of Functions | Graph translations of absolute value, exponential, quadratic, and radical functions. Determine how combining translations affects the key features of the graph of a function. | 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 graphs. | <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x) + k$.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(x + k)$.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $f(kx)$.</p> <p>Describe the effect on the graph for specific values of k, given two functions, $f(x)$ and $kf(x)$.</p> <p>Describe the effects on a graph for more than one transformation using specific values of a, h, and k given two functions, $f(x)$ and $af(x + h) + k$.</p> <p>Determine the value of k for vertical and horizontal translations, stretches, and compressions, given the graphs of the image and pre-image.</p> |
| | | F.IF.C.7: Explain the differences between correlation and | Graph a linear function by hand and using technology and identify the slope and intercepts. |

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| | | causation. Recognize situations where an additional factor may be affecting correlated data.* | Graph a quadratic function by hand and using technology identifying intercepts, maxima, and minima. Graph an absolute value function by hand and using technology. Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function. |
| 10-5 Compressions and Stretches of Functions | Identify the effect on the graph of a function of multiplying output by -1. Identify the effect on the graph of a function of replacing $f(x)$ by $kf(x)$ or $f(kx)$ for specific values of k . | 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 graphs. | 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 $f(x + k)$. Describe the effect on the graph for specific values of k , given two functions, $f(x)$ and $f(kx)$. Describe the effect on the graph for specific values of k , given two functions, $f(x)$ and $kf(x)$. Describe the effects on a graph for more than one transformation using specific values of a , h , and k given two functions, $f(x)$ and $af(x + h) + k$. Determine the value of k for vertical and horizontal translations, stretches, and compressions, given the graphs of the image and pre-image. |
| | | F.IF.C.7: Explain the differences between correlation and causation. Recognize situations where an additional factor may be affecting correlated data.* | 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 an absolute value function by hand and using technology. Attend to precision when illustrating intercepts, maxima, and minima and determine the domain and range of the function. |
| 10-6 Operations with Functions | Combine functions using arithmetic operations, including addition, subtraction, and multiplication. Combine functions to solve real-world problems. | F.BF.A.1: Build a function that describes a relationship between two quantities. | 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 functions. |
| 10-7 Inverse Functions | Write an equation for the inverse of a linear function. Write the inverse of a quadratic function after restricting the domain so the original function is one-to-one. | F.BF.A.1: Build a function that describes a relationship between two quantities. | 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 functions. |