A Correlation of

Algebra 1
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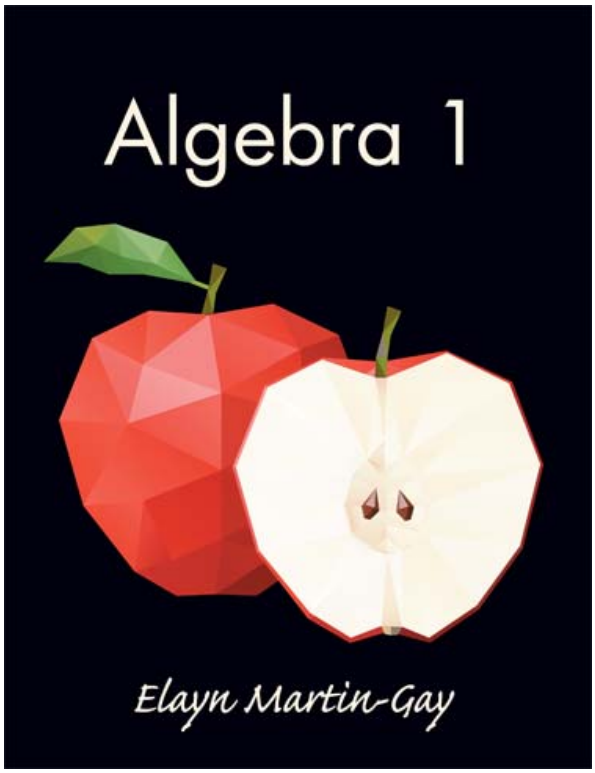

to the

Common Core State Standards for Mathematics - High School

PARCC Model Content Frameworks Mathematics - Algebra I

ALWAYS LEARNING PEARSON

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Introduction

This document demonstrates how **Pearson's *High School Series*** by Elayn Martin-Gay, ©2016, meets the standards of the Common Core State Standards for Mathematics, PARRC Model Content Frameworks Mathematics - Algebra I. **Pearson's *High School Series*** by Elayn Martin-Gay, ©2016, consists of three fully-digital programs carefully crafted by award-winning author Elayn Martin-Gay. Elayn Martin-Gay firmly believes that with an accessible approach to math lessons, supported by student-friendly videos that elaborate on key math concepts, every math student can be successful in math. She has taught math at the University of New Orleans for more than 25 years and earned numerous teaching awards along the way. Martin-Gay's series of highly acclaimed videos are a key element of this robust High School Series, as well as her other bestselling College Math courses.

Algebra 1, Geometry, and Algebra 2 offer:
Consistency: All videos and content have been personally authored and presented by Elayn Martin-Gay offering a consistent voice throughout all three courses.
Unparalleled Videos: Over 3,000 videos by Elayn Martin-Gay are embedded into the eText and available to easily assign to students for step-by-step instructional and support.

Student Support
• **For Algebra 1 and 2**
The **Student Organizer** notebook, both in print and digital formats, help students stay organized, and teach to them develop the key habits of note-taking and journaling. The *Student Organizer* also includes topic-specific practice and homework problems.

• **For Geometry**
The **Student Video Organizer** encourages students to take notes and try practice exercises while watching Elayn Martin-Gay's lecture series. It provides ample space for students to write down key definitions and rules throughout the lectures. "Play" and "Pause" Button icons prompt students to follow along with Elayn for some exercises while they try others on their own.

Teacher support
• Teacher Professional Development videos give helpful teaching strategies for algebra and geometry topics.
• *Implementation Guides* offer teachers with pacing suggestions, mini-lessons for each section of the test, intervention tips, and closure questions.

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Number and Quantity	
The Real Number System N –RN	
Use properties of rational and irrational numbers.	
3. Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	**SE/TE: 1.2:** Symbols and Sets of Numbers, **1.5:** Adding Real Numbers, **1.6:** Subtracting Real Numbers, **9.1:** Introduction to Radicals and Radical Functions, **9.2:** Simplifying Radicals, **9.3:** Adding and Subtracting Radicals
Quantities★ N –Q	
Reason quantitatively and use units to solve problems.	
1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	**SE/TE: 1.1:** Tips for Success in Mathematics, **1.4:** Introduction to Variable Expressions and Equations, **2.5:** An Introduction to Problem Solving, **2.7:** Percent and Problem Solving, **2.8:** Mixture and Distance Problem Solving Extension: Inductive and Deductive Reasoning, **3.1:** Reading Graphs and the Rectangular Coordinate System, **5.6:** Frequency Distributions, Histograms, and Stem-and-Leaf Plots, **5.7:** Mean, Median, and Mode Extension: Box-and-Whisker Plots
2. Define appropriate quantities for the purpose of descriptive modeling.	**SE/TE: 1.1:** Tips for Success in Mathematics, **1.4:** Introduction to Variable Expressions and Equations, **1.9:** Properties of Real Numbers Extension: Probability and Odds, **2.5:** An Introduction to Problem Solving, **2.7:** Percent and Problem Solving, **2.8:** Mixture and Distance Problem Solving Extension: Inductive and Deductive Reasoning, **5.6:** Frequency Distributions, Histograms, and Stem-and-Leaf Plots, **5.7:** Mean, Median, and Mode Extension: Box-and-Whisker Plots, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.6:** Proportion and Problem Solving with Rational Equations, **8.7:** Variation and Problem Solving, **9.6:** Radical Equations and Problem Solving, **9.7:** Right Triangle Trigonometry

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3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	**SE/TE: 1.1:** Tips for Success in Mathematics, **2.7:** Percent and Problem Solving, **2.8:** Mixture and Distance Problem Solving Extension: Inductive and Deductive Reasoning, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **9.6:** Radical Equations and Problem Solving, **9.7:** Right Triangle Trigonometry
Algebra	
Seeing Structure in Expressions A-SSE	
Interpret the structure of expressions	
1. Interpret expressions that represent a quantity in terms of its context.★	**SE/TE: 1.4:** Introduction to Variable Expressions and Equations, **2.1:** Simplifying Algebraic Expressions ,**2.2:** The Addition Property of Equality, **2.3:** The Multiplication Property of Equality, **2.8:** Mixture and Distance Problem Solving, **6.2:** Adding and Subtracting Polynomials, **6.3:** Multiplying Polynomials, **6.4:** Special Products, **6.5:** Negative Exponents and Scientific Notation, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **7.1:** The Greatest Common Factor and Factoring by Grouping, **7.2:** Factoring Trinomials of the Form $x2 + bx + c$, **7.3:** Factoring Trinomials of the Form $ax2 + bx + c$ and Perfect Square Trinomials, **7.4:** Factoring Trinomials of the Form $ax2 + bx + c$ by Grouping, **7.5:** Factoring Binomials, **8.1:** Simplifying Rational Expressions, **8.2:** Multiplying and Dividing Rational Expressions, **8.3:** Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator, **8.4:** Adding and Subtracting Rational Expressions with Unlike Denominators, **9.2:** Simplifying Radicals, **9.3:** Adding and Subtracting Radicals, **9.4:** Multiplying and Dividing Radicals, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula

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a. Interpret parts of an expression, such as terms, factors, and coefficients.	**SE/TE: 1.4:** Introduction to Variable Expressions and Equations, **2.1:** Simplifying Algebraic Expressions, **2.2:** The Addition Property of Equality, **2.3:** The Multiplication Property of Equality, **6.2:** Adding and Subtracting Polynomials, **6.3:** Multiplying Polynomials, **6.4:** Special Products, **7.1:** The Greatest Common Factor and Factoring by Grouping, **7.2:** Factoring Trinomials of the Form $x2 + bx + c$, **7.3:** Factoring Trinomials of the Form $ax2 + bx + c$ and Perfect Square Trinomials, **7.4:** Factoring Trinomials of the Form $ax2 + bx + c$ by Grouping, **7.5:** Factoring Binomials, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula
b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	**SE/TE: 2.1:** Simplifying Algebraic Expressions, **2.2:** The Addition Property of Equality, **2.3:** The Multiplication Property of Equality, **2.6:** Formulas and Problem Solving, **2.8:** Mixture and Distance Problem Solving, **6.5:** Negative Exponents and Scientific Notation, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **7.1:** The Greatest Common Factor and Factoring by Grouping, **7.2:** Factoring Trinomials of the Form $x2 + bx + c$, **7.3:** Factoring Trinomials of the Form $ax2 + bx + c$ and Perfect Square Trinomials, **7.4:** Factoring Trinomials of the Form $ax2 + bx + c$ by Grouping, **7.5:** Factoring Binomials, **8.1:** Simplifying Rational Expressions, **8.2:** Multiplying and Dividing Rational Expressions, **8.3:** Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator, **8.4:** Adding and Subtracting Rational Expressions with Unlike Denominators, **9.2:** Simplifying Radicals, **9.3:** Adding and Subtracting Radicals, **9.4:** Multiplying and Dividing Radicals, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula

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2. Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.	**SE/TE: 2.1:** Simplifying Algebraic Expressions, **2.2:** The Addition Property of Equality, **2.3:** The Multiplication Property of Equality, **6.4:** Special Products, **7.1:** The Greatest Common Factor and Factoring by Grouping, **7.2:** Factoring Trinomials of the Form *x2 + bx + c*, **7.3:** Factoring Trinomials of the Form *ax2 + bx + c* and Perfect Square Trinomials, **7.4:** Factoring Trinomials of the Form *ax2 + bx + c* by Grouping, **7.5:** Factoring Binomials, **8.1:** Simplifying Rational Expressions, **8.2:** Multiplying and Dividing Rational Expressions, **8.3:** Adding and Subtracting Rational Expressions with Common Denominators and Least Common Denominator, **8.4:** Adding and Subtracting Rational Expressions with Unlike Denominators, **9.2:** Simplifying Radicals, **9.3:** Adding and Subtracting Radicals, **9.4:** Multiplying and Dividing Radicals, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula
Write expressions in equivalent forms to solve problems	
3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.★	**SE/TE: 2.1:** Simplifying Algebraic Expressions, **7.1:** The Greatest Common Factor and Factoring by Grouping, **7.2:** Factoring Trinomials of the Form *x2 + bx + c*, **7.3:** Factoring Trinomials of the Form *ax2 + bx + c* and Perfect Square Trinomials, **7.4:** Factoring Trinomials of the Form *ax2 + bx + c* by Grouping, **7.5:** Factoring Binomials, **8.1:** Simplifying Rational Expressions, **9.2:** Simplifying Radicals
a. Factor a quadratic expression to reveal the zeros of the function it defines.	**SE/TE: 7.5:** Factoring Binomials *Integrated Review: Choosing a Factoring Strategy*, **7.6:** Solving Quadratic Equations by Factoring, **7.7:** Quadratic Equations and Problem Solving, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula *Integrated Review: Summary on Solving Quadratic Equations*

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b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	**SE/TE: 10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula *Integrated Review: Summary on Solving Quadratic Equations*
c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.	**SE/TE: 6.1:** Exponents, **6.4:** Special Products *Integrated Review: Exponents and Operations on Polynomials*, **6.5:** Negative Exponents and Scientific Notation, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions
Arithmetic with Polynomials and Rational Expressions A –APR	
Perform arithmetic operations on polynomials	
1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	**SE/TE: 6.2:** Adding and Subtracting Polynomials, **6.3:** Multiplying Polynomials**, 6.8** Dividing Polynomials**, 7.1:** The Greatest Common Factor and Factoring by Grouping **7.2:** Factoring Trinomials of the Form *x2 + bx + c*, **7.3:** Factoring Trinomials of the Form *ax2 + bx + c* and Perfect Square Trinomials, **7.4:** Factoring Trinomials of the Form *ax2 + bx + c* by Grouping, **7.5:** Factoring Binomials *Integrated Review: Choosing a Factoring Strategy*, **7.6:** Solving Quadratic Equations by Factoring, **7.7:** Quadratic Equations and Problem Solving
Understand the relationship between zeros and factors of polynomials	
3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	**SE/TE: 10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models

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Creating Equations★ A –CED	
Create equations that describe numbers or relationships	
1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.	**SE/TE: 2.4:** Solving Linear Equations, **2.5:** An Introduction to Problem Solving, **4.1:** Linear Inequalities and Problem Solving, **4.2:** Compound Inequalities, **4.3:** Absolute Value Equations, **4.4:** Absolute Value Inequalities, **4.5:** Graphing Linear Inequalities, **7.6:** Solving Quadratic Equations by Factoring, **7.7:** Quadratic Equations and Problem Solving, **8.6:** Proportion and Problem Solving with Rational Equations, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula
2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**SE/TE: 3.2:** Graphing Linear Equations, **3.3:** Intercepts, **3.4:** Slope and Rate of Change, **3.5:** Equations of Lines, **3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.8:** Graphing Rational Functions by Transformations, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models
3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	**SE/TE: 2.8:** Mixture and Distance Problem Solving, **4.1:** Linear Inequalities and Problem Solving, **4.2:** Compound Inequalities, **5.1:** Solving Systems of Linear Equations by Graphing, **5.2:** Solving Systems of Linear Equations by Substitution, **5.3:** Solving Systems of Linear Equations by Addition, **5.4:** Systems of Linear Equations and Problem Solving, **5.5:** Systems of Linear Inequalities
4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.	**SE/TE: 2.6:** Formulas and Problem Solving

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Reasoning with Equations and Inequalities A -RE I	
Understand solving equations as a process of reasoning and explain the reasoning	
1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	**SE/TE: 2.2:** The Addition Property of Equality, **2.3:** The Multiplication Property of Equality, **2.4:** Solving Linear Equations, **2.5:** An Introduction to Problem Solving, **5.2:** Solving Systems of Linear Equations by Substitution, **5.3:** Solving Systems of Linear Equations by Addition, **5.4:** Systems of Linear Equations and Problem Solving, **7.6:** Solving Quadratic Equations by Factoring, **7.7:** Quadratic Equations and Problem Solving, **8.6:** Proportion and Problem Solving with Rational Equations, **9.5:** Solving Equations Containing Radicals, **9.6:** Radical Equations and Problem Solving, **10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula
Solve equations and inequalities in one variable	
3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**SE/TE: 2.4:** Solving Linear Equations *Integrated Review: Solving Linear Equations*, **2.5:** An Introduction to Problem Solving, **4.1:** Linear Inequalities and Problem Solving, **4.2:** Compound Inequalities *Integrated Review: Linear and Compound Inequalities*
4. Solve quadratic equations in one variable.	**SE/TE: 10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula *Integrated Review: Summary on Solving Quadratic Equations*

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a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	**SE/TE: 10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula *Integrated Review: Summary on Solving Quadratic Equations*
b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	**SE/TE: 10.1:** Solving Quadratic Equations by the Square Root Property, **10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula *Integrated Review: Summary on Solving Quadratic Equations*
Solve systems of equations	
5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	**SE/TE: 5.2:** Solving Systems of Linear Equations by Substitution, **5.3:** Solving Systems of Linear Equations by Addition *Integrated Review: Solving Systems of Equations*, **5.4:** Systems of Linear Equations and Problem Solving
6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**SE/TE: 5.1:** Solving Systems of Linear Equations by Graphing, **5.2:** Solving Systems of Linear Equations by Substitution, **5.3:** Solving Systems of Linear Equations by Addition *Integrated Review: Solving Systems of Equations*, **5.4:** Systems of Linear Equations and Problem Solving
Represent and solve equations and inequalities graphically	
10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	**SE/TE: 3.2:** Graphing Linear Equations, **3.3:** Intercepts, **3.4:** Slope and Rate of Change, **3.5:** Equations of Lines, **3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.8:** Graphing Rational Functions by Transformations, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models

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11. Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.★	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.8:** Graphing Rational Functions by Transformations, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models
12. Graph the solutions to a linear inequality in two variables as a halfplane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**SE/TE: 4.4:** Absolute Value Inequalities, **4.5:** Graphing Linear Inequalities, **5.5:** Systems of Linear Inequalities
Functions	
Interpreting Functions F-IF	
Understand the concept of a function and use function notation	
1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions
2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.8:** Graphing Rational Functions by Transformations, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models
3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions, **Appendix F:** Arithmetic and Geometric Sequences

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Interpret functions that arise in applications in terms of the context	
4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.★	**SE/TE: 3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.8:** Graphing Rational Functions by Transformations, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models
5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.★	**SE/TE: 3.6:** Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.8:** Graphing Rational Functions by Transformations, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models
6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★	**SE/TE: 3.4:** Slope and Rate of Change**,** **3.7:** Graphing Linear Functions
Analyze functions using different representations	
7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.7:** Variation and Problem Solving, **8.8:** Graphing Rational Functions by Transformations, **9.1:** Introduction to Radicals and Radical Functions, **10.5:** Linear, Quadratic, and Exponential Models
a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	**SE/TE: 3.7:** Graphing Linear Functions, **10.4:** Graphing Quadratic Equations, **10.5:** Linear, Quadratic, and Exponential Models
b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	**SE/TE: 3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **9.1:** Introduction to Radicals and Radical Functions

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8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.7:** Variation and Problem Solving, **8.8:** Graphing Rational Functions by Transformations, **9.1:** Introduction to Radicals and Radical Functions, **10.5:** Linear, Quadratic, and Exponential Models
a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	**SE/TE: 10.2:** Solving Quadratic Equations by Completing the Square, **10.3:** Solving Quadratic Equations by the Quadratic Formula**,** **10.5:** Linear, Quadratic, and Exponential Models
9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	**SE/TE: 3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.7:** Variation and Problem Solving, **8.8:** Graphing Rational Functions by Transformations, **9.1:** Introduction to Radicals and Radical Functions, **10.5:** Linear, Quadratic, and Exponential Models
Building Functions F-BF	
Build a function that models a relationship between two quantities	
1. Write a function that describes a relationship between two quantities.★	**SE/TE: 3.6:** Functions, **3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **8.7:** Variation and Problem Solving, **8.8:** Graphing Rational Functions by Transformations, **9.1:** Introduction to Radicals and Radical Functions, **10.5:** Linear, Quadratic, and Exponential Models

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a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	**SE/TE: 1.4:** Introduction to Variable Expressions and Equations, **2.1:** Simplifying Algebraic Expressions, **2.4:** Solving Linear Equations, **2.5:** An Introduction to Problem Solving, **5.2:** Solving Systems of Linear Equations by Substitution, **5.3:** Solving Systems of Linear Equations by Addition, **5.4:** Systems of Linear Equations and Problem Solving, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **7.7:** Quadratic Equations and Problem Solving, **10.5:** Linear, Quadratic, and Exponential Models, **Appendix F:** Arithmetic and Geometric Sequences
Build new functions from existing functions	
3. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	**SE/TE: 3.7:** Graphing Linear Functions, **3.8:** Graphing Piecewise-Defined Functions and Shifting and Reflecting Graphs of Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **8.8:** Graphing Rational Functions by Transformations
Linear, Quadratic, and Exponential Models★ F -LE	
Construct and compare linear, quadratic, and exponential models and solve problems	
1. Distinguish between situations that can be modeled with linear functions and with exponential functions.	**SE/TE: 3.7:** Graphing Linear Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **10.5:** Linear, Quadratic, and Exponential Models
a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	**SE/TE: 3.7:** Graphing Linear Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions, **10.5:** Linear, Quadratic, and Exponential Models
b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	**SE/TE: 3.2:** Graphing Linear Equations, **3.3:** Intercepts, **3.4:** Slope and Rate of Change, **3.5:** Equations of Lines, **3.7:** Graphing Linear Functions, **10.5:** Linear, Quadratic, and Exponential Models

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c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	**SE/TE: 6.6:** Graphing Exponential Functions and Using the Compound Interest Formula **6.7:** Exponential Growth and Decay Functions, **10.5:** Linear, Quadratic, and Exponential Models
2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	**SE/TE: 3.7:** Graphing Linear Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions
3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	**SE/TE: 6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions
Interpret expressions for functions in terms of the situation they model	
5. Interpret the parameters in a linear or exponential function in terms of a context.	**SE/TE: 3.7:** Graphing Linear Functions, **6.6:** Graphing Exponential Functions and Using the Compound Interest Formula, **6.7:** Exponential Growth and Decay Functions
Statistics and Probability	
Interpreting Categorical and Quantitative Data S-ID	
Summarize, represent, and interpret data on a single count or measurement variable	
1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	**SE/TE: 5.6:** Frequency Distributions, Histograms, and Stem-and-Leaf Plots, **5.7:** Mean, Median, and Mode Extension: Box-and-Whisker Plots
2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	**SE/TE: 5.7:** Mean, Median, and Mode Extension: Box-and-Whisker Plots
3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	**SE/TE: 5.6:** Frequency Distributions, Histograms, and Stem-and-Leaf Plots, **5.7:** Mean, Median, and Mode Extension: Box-and-Whisker Plots

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Summarize, represent, and interpret data on two categorical and quantitative variables	
5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associated and trends in the data.	**Related material:** **SE/TE: 5.6:** Frequency Distributions, Histograms, and Stem-and-Leaf Plots, **5.7:** Mean, Median, and Mode Extension: Box-and-Whisker Plots, **Appendix B:** Survey Problems **Appendix C:** The Fundamental Counting Principle
6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	**SE/TE: 3.1:** Reading Graphs and the Rectangular Coordinate System, **10.5:** Linear, Quadratic, and Exponential Models
a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	**SE/TE: 3.1:** Reading Graphs and the Rectangular Coordinate System, **10.5:** Linear, Quadratic, and Exponential Models
b. Informally assess the fit of a function by plotting and analyzing residuals.	**SE/TE: 3.1:** Reading Graphs and the Rectangular Coordinate System, **10.5:** Linear, Quadratic, and Exponential Models
c. Fit a linear function for a scatter plot that suggests a linear association.	**SE/TE: 3.1:** Reading Graphs and the Rectangular Coordinate System, **10.5:** Linear, Quadratic, and Exponential Models
Interpret linear models	
7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	**SE/TE: 3.2:** Graphing Linear Equations, **3.3:** Intercepts, **3.4:** Slope and Rate of Change
8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	**SE/TE: 3.1:** Reading Graphs and the Rectangular Coordinate System
9. Distinguish between correlation and causation.	**SE/TE: 3.1:** Reading Graphs and the Rectangular Coordinate System