Course Resources:

8th Grade Algebra Chapter Outcomes.docx

Unit	State Standards	Outcomes	Essential Questions	Essential Skills	Assessments	Faith Integration
Entire Year						
Chapter 1 Solving Linear Equations *(updated 6/6/19)*	HSA-CED.A.4(A) 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. HSA-REI.A.1(A) 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. HSA-CED.A.1(I) 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. HSA-REI.B.3(I) Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.		1.1 How can you use inductive reasoning to discover rules in mathematics? How can you test a rule? 1.2 How can you solve a multi-step equation? How can you check the reasonableness of your solution? 1.3 How can you solve an equation that has variables on both sides? 1.4 How can you use a formula for one measurement to write a formula for a different measurement?	Solve Equations using addition, subtraction, multiplication,and division. Solve two-step equations. Solve equations with variables on both sides. Write and rewrite equations involving formulas.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.
Chapter 2 Graphing and Writing Linear Equations *(updated 6/6/19)*	HSA-CED.A.2(A) Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. 8.F.A.3(I) Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line. 8.F.B.4(I) Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. HSA-CED.A.3(I) 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. HSA-REI.D.10(I)		2.1 How can you recognize a linear equation? How can you draw its graph? 2.2 How can the slope of a line be used to describe the line? 2.3 How can you describe the graph of the equation y=mx+b? 2.4 How can you describe the graph of the equation ax=by=c? 2.5 How can you write an equation of a line when you are given the slope and y-intercept of the line? 2.6 How can you write an equation of a line when you are given the slope and a point on the line? 2.7 How can you use a linear equation in two variables to model and solve a real-llife problem?	Graph linear equations. Find the slope of a line, including a horizontal and vertical line. Identify parallel and perpendicular lines, and write equations for them. Identify slopes and y-intercepts. Graph and write linear equations in slope-intercept form, standard form, and point-slope form.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	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).					
Chapter 3 Solving Linear Inequalities *(updated 6/6/19)*	HSA-CED.A.1(I) 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. HSA-CED.A.3(I) 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. HSA-REI.B.3(I) Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. HSA-REI.D.12(I) Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.		3.1 How can you use an inequality to describe a real-life statement? 3.2 How can you use addition or subtraction to solve an inequality? 3.3 How can you use multiplication or division to solve an inequality? 3.4 How can you use an inequality to describe the area and perimeter of a composite figure? 3.5 How can you use a coordinate plane to solve problems involving linear inequalities?	Write and graph inequalities and check solutions. Solve inequalities using addition, subtraction, multiplication, and division. Solve multi-step inequalities including those with no solutions or many solutions. Solve absolute value inequalities. Check solutions of linear inequalities. Graph linear equations in one and two variables.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.
Chapter 4 Solving Systems of Linear Equations *(updated 6/6/19)*	8.EE.C.8(A) Analyze and solve pairs of simultaneous linear equations. •a. Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. •b. Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6. •c. Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair. HSA-CED.A.3(A) 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. HSA-REI.C.5(A)		4.1 How can you solve a system of linear equations? 4.2 How can you use substitution to solve a system of linear equations? 4.3 How can you use elimination to solve a system of linear equations? 4.4 Can a system of linear equations have no solution? Can a system of linear equations have many solutions? 4.5 How can you sketch the graph of a system of linear inequalities?	Solve a system of linear equations by graphing, substitution, and elimination. Solve a system of linear equations with no solution or infinitely many solutions. Write and graph linear inequalities and systems of linear inequalities.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	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. HSA-REI.C.6(A) Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. HSA-REI.D.12(A) Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.					
Chapter 5 Linear Functions *(updated 6/6/19)*	8.F.A.1(A) Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. 8.F.A.3(A) Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line. 8.F.B.4(A) Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. HSF-IF.A.1(A) 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). HSF-IF.A.2(A) Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. HSF-IF.A.3(A) 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 is greater		5.1 How can you find the domain and range of a function? 5.2 How can you decide whether the domain of a function is discrete or continuous? 5.3 How can you use a linear function to describe a linear pattern? 5.4 How can you use function notation to represent a function? 5.5 How can you recognize when a pattern in real life is linear or nonlinear? 5.6 How are arithmetic sequences used to describe patterns?	Find the domain and range from a graph. Find the range of a function. Determine whether relations are functions. Use the vertical line test. Graph discrete and continuous data. Find a linear function using a graph or table. Evaluate a function. Solve functions for the independent variable. Graph a linear function in function notation. Write and graph a piecewise function, and absolute value function. Identify functions from tables, graphs, and equations. Write, extend and graph arithmetic sequences.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

than or equal to 1.

HSF-IF.B.5(A)
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.

HSF-LE.A.1(A)
Distinguish between situations that can be modeled with linear functions and with exponential functions.
•a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
•b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
•c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

HSF-IF.C.7(I)
Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
•a. Graph linear and quadratic functions and show intercepts, maxima, and minima.
•b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
•c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
•d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
•e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

HSF-BF.A.2(I)
Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

HSF-BF.B.3(I)
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.

HSF-LE.A.2(I)
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).					
Chapter 6 Exponential Equations and Functions *(updated 6/6/19)*	HSN-RN.A.1(A) Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})3 = 5(1/3)3$ to hold, so $(5^{1/3})^3$ must equal 5. HSN-RN.B.3(A) 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. HSA-REI.B.3(A) Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. HSF-IF.A.3(A) 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 is greater than or equal to 1. HSF-IF.C.7(A) Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. •a. Graph linear and quadratic functions and show intercepts, maxima, and minima. •b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. •c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. •d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. •e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. HSF-BF.A.2(A) Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. HSF-LE.A.2(A) 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). HSN-RN.A.2(I)		6.1 How can you multiply and divide square roots? 6.2 How can you use inductive reasoning to observe patterns and write general rules involving properties of exponents. 6.3 How can you write and evaluate an *n*th root of a number? 6.4 What are the characteristics of an exponential function? 6.5 What are the characteristics of exponential growth? 6.6 What are the characteristics of exponential decay? 6.7 How are geometric sequences used to describe patterns?	Simplify and evaluate square roots and radical expressions. Determine sums and products of rational and irrational numbers. Use the product of powers, quotient of powers, and power of a power properties. Find *n*th roots. Simplify expressions with rational exponents. Use properties of exponents. Identify, graph, and evaluate exponential functions. Graph vertical translations. Solve exponential equations. Use exponential growth functions. Write compound interest functions. Identify and interpret exponential growth and decay. Graph and extend a geometric sequence.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	Rewrite expressions involving radicals and rational exponents using the properties of exponents. HSA-SSE.A.1(I) Interpret expressions that represent a quantity in terms of its context. •a. Interpret parts of an expression, such as terms, factors, and coefficients. •b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P. HSA-REI.D.11(I) 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.					
Chapter 7 Polynomial Equations and Factoring *(updated 6/6/19)*	HSA-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. •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. HSA-APR.A.1(A) 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. HSA-SSE.A.2(I) 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 $(x^2 - y^2)(x^2 + y^2)$. HSA-SSE.B.3(I) Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. •a. Factor a quadratic expression to reveal the zeros of the function it defines. •b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. •c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t}$ is about 1.012^{12t} to reveal the approximate equivalent monthly interest rate if the annual rate is 15%. HSA-REI.B.4(I) Solve quadratic equations in one variable.		\(ax^2+bx+c\)7.1 How can you use algebra tiles to model and classify polynomials. 7.2 How can you add polynomials? How can you subtract polynomials? 7.3 How can you multiply two binomials? 7.4 What are the patterns in the special products (a=b)(a-b), \((a=b)^2\), and \((a-b)^2\) ? 7.5 How can you solve a polynomial equation that is written in factored form? 7.6 How can you use common factors to write a polynomial in factored form? 7.7 How can you factor the trinomial \(x^2+bx+c\) into the product of two binomials? 7.8 How can you factor the trinomial \(ax^2+bx+c\) into the product of two binomials? 7.9 How can you recognize and factor special products?	Find the degrees of monomials. Classify polynomials. Add and subtract polynomials. Multiply binomials using the distributive property, a table, and the FOIL method. Multiply a binomial and a trinomial. Use the sum and difference pattern, and the square of a binomial pattern. Solve polynomial equations. Factor polynomials. Solve equations by factoring. Factor\(x^2+bx+c\) when b and c are positive, b is negative and c is positive, and when c is negative. Factor out the GCF of a polynomial. Factor\(x^2+bx+c\) when ac is positive and when ac is negative. Factor the difference of two squares. Factor perfect square trinomials. Factor polynomials by grouping. Solve an equation by factoring completely.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	•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. •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.					
Chapter 8 Graphing Quadratic Functions *(updated 6/6/19)*	HSF-IF.B.6(A) 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. HSF-IF.C.7(A) Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. •a. Graph linear and quadratic functions and show intercepts, maxima, and minima. •b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. •c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. •d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. •e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. HSF-BF.B.3(A) 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. HSF-IF.B.4(I) 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.		8.1 What are the characteristics of the graph of the quadratic function $y=ax^2$? How does the value of a affect the graph of $y=ax^2$? 8.2 Why do satellite dishes and spotlight reflectors have parabolic shapes? 8.3 How does the value of c affect the graph of $y=ax^2+c$? 8.4 How can you find the vertex of the graph of $y=ax^2+bx+c$? 8.5 How can you compare the growth rates of linear, exponential, and quadratic functions?	Identify characteristics of a Quadratic function. Graph $y=ax^2$ when a>0 and a <0. Find the focus and write an equation of a parabola. Graph and translate $y=x^2+c$ Graph $y=ax^2+c$ Find the Axis of Symmetry and the vertex of a graph. Graph $y=ax^2+bx+c$ Find the maximum and minimum values of a parabola. Graph $y=(x-h)^2$ Graph $y=(x-h)^2=k$ Graph $y=a(x-h)^2+k$ Identify and write linear, exponential, and quadratic functions using graphs, differences or ratios.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

Chapter 9 Solving Quadratic Equations *(updated 6/6/19)*	HSA-SSE.B.3(A) Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. •a. Factor a quadratic expression to reveal the zeros of the function it defines. •b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. •c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t}$ is about 1.012^{12t} to reveal the approximate equivalent monthly interest rate if the annual rate is 15%. HSA-REI.B.4(A) Solve quadratic equations in one variable. •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. •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. HSA-REI.C.7(A) Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line y = -3x and the circle $x^2 + y^2 = 3$. HSA-REI.D.11(A) 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. HSF-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. 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. •b. Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as		9.1 How can you use a graph to solve a quadratic equation in one variable? 9.2 How can you determine the number of solutions of a quadratic equation of the form \(ax^2+c=0\) ? 9.3 How can you use "completing the square" to solve a quadratic equation? 9.4 How can you use the discriminant to determine the number of solutions of a quadratic equation? 9.5 How can you solve a system of two equations when one is linear and the other is quadratic?	Solve a quadratic equation with 2, 1, or no real solutions. Solve quadratic equations using square roots, and completing the square, and using the quadratic formula. Solve and analyze a system of linear and quadratic equations.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	representing exponential growth or decay.					
Chapter 10 Square Root Functions and Geometry *(updated 6/6/19)*	8.G.B.6(A) Explain a proof of the Pythagorean Theorem and its converse. 8.G.B.7(A) Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. 8.G.B.8(A) Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. HSN-RN.A.2(A) Rewrite expressions involving radicals and rational exponents using the properties of exponents. HSF-IF.B.4(A) 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. HSF-IF.C.7(A) Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. •a. Graph linear and quadratic functions and show intercepts, maxima, and minima. •b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. •c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior. •d. Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior. •e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.		10.1 How can you sketch the graph of a square root function? 10.2 How can you solve an equation that contains square roots? 10.3 How are the lengths of the sides of a right triangle related? 10.4 In what other ways can you use the Pythagorean Theorem?	Find the domain of a square root function. Compare graphs of square root functions. Solve square root equations. Identify extraneous solutions. Find the length of a hypotenuse. Find the length of a leg of a right triangle. Identify right triangles. Find the distance between two points using the distance formula.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.
Chapter 11 Rational Equations and Functions *(updated 6/6/19)*	HSA-SSE.A.2(A) 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 $(x^2 - y^2)(x^2 + y^2)$. HSA-CED.A.1(A) 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. HSA-REI.D.10(A)		11.1 How can you recognize when two variables vary directly? How can you recognize when they vary inversely? 11.2 What are the characteristics of the graph of a rational function? 11.3 How can you simplify a rational expression? What are the excluded values of a rational expression? 11.4 How can you multiply	Identify, write, and graph direct and inverse variation. Find the excluded value of a rational function. Graph and compare graphs of a rational function. Identify asymptotes. Find inverse relations and functions. Simplify rational expressions Multiply and divide rational expressions. Divide a polynomial by a monomial. Divide a polynomial by a binomial with/without remainders.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	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). HSF-BF.B.4(A) Find inverse functions. •a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2x^3$ or f(x) = (x+1)/(x-1) for x is not equal to 1. •b. Verify by composition that one function is the inverse of another. •c. Read values of an inverse function from a graph or a table, given that the function has an inverse. •d. Produce an invertible function from a non-invertible function by restricting the domain.		and divide rational expressions? 11.5 How can you divide one polynomial by another polynomial? 11.6 How can you add and subtract rational expressions? 11.7 How can you solve a rational equation?	Add and subtract rational expressions with like/unlike denominators. Find the LCD of two rational expressions. Solve rational equations using cross products. Solve rational equations using the LCD.		
Chapter 12 Data Analysis and Displays *(updated 6/6/19)*	8.SP.A.1(A) Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. 8.SP.A.4(A) Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores? HSS-ID.A.1(A) Represent data with plots on the real number line (dot plots, histograms, and box plots). HSS-ID.A.2(A) 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. HSS-ID.A.3(A) Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). HSS-ID.B.6(A) Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. •a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize		12.1 How can you use measures of central tendency to distribute an amount evenly among a group of people? 12.2 How can you measure the dispersion of a data set? 12.3 How can you use a box-and-whisker plot to describe a data set? 12.4 How can you use a histogram to characterize the basic shape of a distribution? 12.5 How can you use data to predict an event? 12.6 How can you find a line that best models a data set? 12.7 How can you read and make a two-way table? 12.8 How can you display data in a way that helps you make decisions?	Find the mean, median, and mode of a data set. Identify and remove an outlier in a data set. Find the range and standard deviation of a data set. Construct, interpret, and compare a box-and-whisker plot. Describe the shape of a distribution. Choose an appropriate measure of central tendency. Interpret a scatter plot, and find a line of fit including using residuals. Read, construct, and find a relationship in a two-way table. Find marginal frequencies. Choose an appropriate data display. Identify and analyze a misleading data display.	Informal observation Exit Tickets Section Quizzes Chapter Tests	"But all things should be done decently and in order." 1 Corinthians 14:40. God has created an amazingly ordered world, and it is our responsibility to be productive stewards of His creation.

	linear, quadratic, and exponential models. •b. Informally assess the fit of a function by plotting and analyzing residuals. •c. Fit a linear function for a scatter plot that suggests a linear association. HSS-ID.C.7(A) Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. HSS-ID.C.8(A) Compute (using technology) and interpret the correlation coefficient of a linear fit. HSS-ID.C.9(A) Distinguish between correlation and causation.					