

# Wyoming Department of Education Required Virtual Education Course Syllabus

## BIG HORN COUNTY SCHOOL DISTRICT #1

Program Name	WYCA	Content Area	Mathematics
Course ID	CAMA79444	Grade Level	9, 10, 11, 12
Course Name	Algebra 2 A	# of Credits	0.5
SCED Code	02056G0.5012	Curriculum Type	Connections Academy

### COURSE DESCRIPTION

*In this first semester of Algebra 2, the student will review and expand on his learning from Algebra 1. The beginning units will focus mostly on the equation and the inequality. The student will write, solve, and graph these in a variety of real-world scenarios. The last few units will focus on types of functions. The student will continue his study of quadratic and radical functions from Algebra 1, but will expand this to include exponential and logarithmic functions. As before, the student will write, solve, and graph these functions. Use of a graphing calculator is encouraged.*

### WYOMING CONTENT AND PERFORMANCE STANDARDS

STANDARD#	BENCHMARK
N.RN.1	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.
N.RN.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.
N.CN.1	Know there is a complex number $i$ such that $i^2 = -1$ , and every complex number has the form $a + bi$ with $a$ and $b$ real.
N.CN.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.
N.CN.3	Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.
N.CN.4	Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.
N.CN.5	Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation.
N.CN.6	Calculate the distance between numbers in the complex plane as the modulus of the difference, and the midpoint of a segment as the average of the numbers at its endpoints.
N.CN.7	Solve quadratic equations with real coefficients that have complex solutions.
N.CN.8	Extend polynomial identities to the complex numbers.
N.CN.9	Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
N.VM.1	Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., $v$ , $ v $ , $  v  $ , $v$ ).
N.VM.2	Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.
N.VM.3	Solve problems involving velocity and other quantities that can be represented by vectors.
N.VM.4	Add and subtract vectors:
NVM.4a	Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes.
N.VM.4b	Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum.
N.VM.4c	Understand vector subtraction $v - w$ as $v + (-w)$ , where $-w$ is the additive inverse of $w$ , with the same magnitude as $w$ and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.
N.VM.5	Multiply a vector by a scalar:
N.VM.5a	Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$ .
N.VM.5b	Compute the magnitude of a scalar multiple $cv$ using $  cv   =  c v$ . Compute the direction of $cv$ knowing that when $ c  \neq 0$ , the direction of $cv$ is either along $v$ (for $c > 0$ ) or against $v$ (for $c < 0$ ).
N.VM.6	Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.
N.VM.7	Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
N.VM.8	Add, subtract, and multiply matrices of appropriate dimensions.
N.VM.9	Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.
N.VM.10	Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.
N.VM.11	Multiply a vector (regarded as a matrix with one column) by a matrix of suitable dimensions to produce another vector. Work with matrices as transformations of vectors.
N.VM.12	Work with $2 \times 2$ matrices as a transformations of the plane, and interpret the absolute value of the determinant in terms of area.
A.SSE.1	Interpret expressions that represent a quantity in terms of its context:
A.SSE.1a	Interpret parts of an expression, such as terms, factors, and coefficients.
A.SSE.1b	Interpret complicated expressions by viewing one or more of their parts as a single entity.

A.SSE.2	Use the structure of an expression to identify ways to rewrite it.
A.SSE.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression:
A.SSE.3a	Factor a quadratic expression to reveal the zeros of the function it defines.
A.SSE.3b	Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
A.SSE.3c	Use the properties of exponents to transform expressions for exponential functions.
A.SSE.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.
A.APR.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.
A.APR.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number $a$ , the remainder on division by $x - a$ is $p(a)$ , so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$ .
A.APR.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.
A.APR.C.4	Prove polynomial identities and use them to describe numerical relationships.
A.APR.5	Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of $x$ and $y$ for a positive integer $n$ , where $x$ and $y$ are any numbers, with coefficients determined for example by Pascal's Triangle.
A.APR.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$ , where $a(x)$ , $b(x)$ , $q(x)$ , and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$ , using inspection, long division, or, for the more complicated examples, a computer algebra system.
A.APR.7	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.
A.CED.1	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
A.CED.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
A.CED.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.
A.CED.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
A.REI.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
A.REI.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
A.REI.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
A.REI.4	Solve quadratic equations in one variable:
A.REI.4a	Use the method of completing the square to transform any quadratic equation in $x$ into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.
A.REI.4b	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 $b$ .
A.REI.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
A.REI.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$ .
A.REI.8	Represent a system of linear equations as a single matrix equation in a vector variable.
A.REI.9	Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension $3 \times 3$ or greater).
A.REI.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
A.REI.11	Explain why the $x$ -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and
A.REI.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
F.IF.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If $f$ is a function and $x$ is an element of its domain, then $f(x)$ denotes the output of $f$ corresponding to the input $x$ . The graph of $f$ is the graph of the equation $y = f(x)$ .

F.IF.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
F.IF.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.
F.IF.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
F.IF.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
F.IF.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
F.IF.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases:
F.IF.7a	Graph linear and quadratic functions and show intercepts, maxima, and minima.
F.IF.7b	Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
F.IF.7c	Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.
F.IF.7d	Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
F.IF.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
F.IF.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function:
F.IF.8a	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.
F.IF.8b	Use the properties of exponents to interpret expressions for exponential functions.
F.IF.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
F.BF.1	Write a function that describes a relationship between two quantities:
F.BF.1a	Determine an explicit expression, a recursive process, or steps for calculation from a context.
F.BF.1b	Combine standard function types using arithmetic operations.
F.BF.1c	Compose functions.
F.BF.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
F.BF.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.
F.BF.4	Find inverse functions:
F.BF.4a	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.
F.BF.4b	Verify by composition that one function is the inverse of another.
F.BF.4c	Read values of an inverse function from a graph or a table, given that the function has an inverse.
F.BF.4d	Produce an invertible function from a non-invertible function by restricting the domain.
F.BF.5	Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
F.LE.1	Distinguish between situations that can be modeled with linear functions and with exponential functions:
F.LE.1a	Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
F.LE.1b	Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
F.LE.1c	Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
F.LE.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
F.LE.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
F.LE.4	For exponential models, express as a logarithm the solution to $abct = d$ where $a$ , $c$ , and $d$ are numbers and the base $b$ is 2, 10, or $e$ ; evaluate the logarithm using technology.
F.LE.5	Interpret the parameters in a linear or exponential function in terms of a context.
F.TF.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
F.TF.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.
F.TF.3	Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$ , $\pi/4$ and $\pi/6$ , and use the unit circle to express the values of sine, cosines, and tangent for $x$ , $\pi + x$ , and $2\pi - x$ in terms of their values for $x$ , where $x$ is any real number.
F.TF.4	Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.
F.TF.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.

F.TF.6	Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.
F.TF.7	Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.
F.TF.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ given $\sin(\theta)$ , $\cos(\theta)$ , or $\tan(\theta)$ and the quadrant of the angle.
F.TF.9	Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.
G.SRT.7	Explain and use the relationship between the sine and cosine of complementary angles.
G.C.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
G.GPE.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.
G.GPE.2	Derive the equation of a parabola given a focus and directrix.
G.GPE.3	Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.
G.GPE.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
G.GMD.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.
G.MG.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).
S.ID.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).
S.ID.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
S.ID.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
S.ID.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
S.IC.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
S.IC.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.
S.IC.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
S.IC.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
S.IC.B5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
S.IC.6	Evaluate reports based on data.
S.CP.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).
S.CP.2	Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
S.CP.3	Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$ , and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
S.CP.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.
S.CP.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.
S.CP.6	Find the conditional probability of A given B as the fraction of B’s outcomes that also belong to A, and interpret the answer in terms of the model.
S.CP.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$ , and interpret the answer in terms of the model.
S.CP.8	Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B A) = P(B)P(A B)$ , and interpret the answer in terms of the model.
S.CP.9	Use permutations and combinations to compute probabilities of compound events and solve problems.

S.MD.1	Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
S.MD.2	Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
S.MD.3	Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value.
S.MD.4	Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value.
S.MD.5	Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values:
S.MD.5a	Find the expected payoff for a game of chance.
S.MD.5b	Evaluate and compare strategies on the basis of expected values.
S.MD.6	Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
S.MD.7	Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

#### SCOPE AND SEQUENCE

UNIT OUTLINE	STANDARD#	OUTCOMES
<p><b>Unit 1: Focus on Success</b></p> <p>In this unit, you will focus on ways to think about success in this algebra course. You will learn how to set personal goals, establish study strategies that reduce anxiety, and review ways to be an active learner. The goal of this unit is to help you establish a positive mindset at the start of the course. This includes understanding how effort impacts goal attainment, appreciating the importance of taking initiative with learning, and embracing the many resources available to help you throughout the course, such as your fellow students, your teacher, online tools, and your Learning Coach.</p>		<ul style="list-style-type: none"> <li>• Use strategies such as self-assessment and reflection in order to improve mathematical performance</li> <li>• Distinguish between effort-based and ability-based models of learning</li> <li>• Assess personal readiness for study and learning</li> <li>• Use resources to assist with goal-setting and attainment</li> </ul>
<p><b>Unit 2: Expressions, Equations, and Inequalities</b></p> <p>In this unit, you will explore algebraic expressions, equations, and inequalities, including how to model and solve real-world applications using these concepts. Some of these concepts, such as those involved in simplifying algebraic expressions and solving equations, are a review from previous math courses, and other concepts, such as those concerned with writing and solving equations and inequalities involving absolute value, are new for this course. The concepts presented in this unit will be used throughout this course.</p>	A.SSE.1, A.SSE.2, A.CED.1, A.CED.4, A.REI.1, A.REI.3	<ul style="list-style-type: none"> <li>• Use variables to represent unknown quantities in order to identify and use patterns to solve problems</li> <li>• Represent quantities with algebraic expressions and use properties to manipulate and evaluate algebraic expressions</li> <li>• Use properties to solve equations and inequalities, including compound inequalities and those involving absolute value</li> <li>• Write, graph, and use equations and inequalities to model and solve problems</li> </ul>
<p><b>Unit 3: Functions, Equations, and Graphs</b></p> <p>In this unit, you will expand your knowledge of equations by exploring relations that can be represented by special equations, called functions. Direct variation, linear, and absolute value functions and their graphs will be used to solve a variety of problems. In addition, you will learn the different forms in which a linear equation can be written as well as identify transformations of functions, such as vertical and horizontal translations, reflection, stretching, and compressing.</p>	A.CED.2, A.REI.10, A.REI.12, F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7, F.IF.7a, F.IF.7c, F.IF.8, F.BF.1, F.BF.3, F.LE.1, F.LE.1a, F.LE.1b, F.LE.5, G.GPE.5	<ul style="list-style-type: none"> <li>• Identify and graph relations and functions, including direct variation and absolute value</li> <li>• Model real-world data and make predictions using linear equations</li> <li>• Identify and graph transformations of functions</li> <li>• Graph two-variable inequalities, including absolute value inequalities</li> <li>• Use functions and inequalities to model and solve real-world problems</li> </ul>
<p><b>Unit 4: Linear Systems</b></p> <p>In this unit, you will learn about linear systems and how to use them to solve problems that come up in real situations. Throughout the unit, you will explore the different methods for solving systems, such as using tables, graphs, or matrices, and the different ways in which a system can be solved algebraically. Linear programming will be used to solve real-world problems, such as ones involving maximizing profit.</p>	N.VM.6, N.VM.8, A.CED.2, A.CED.3, A.REI.6, A.REI.8, A.REI.11, A.REI.12	<ul style="list-style-type: none"> <li>• Write, solve, and use systems of linear equations to solve problems</li> <li>• Write, solve, and use systems of linear inequalities to solve problems</li> <li>• Use linear programming to model and solve real-world problems</li> <li>• Solve systems in three variables using elimination, substitution, and matrices</li> </ul>

<p><b>Unit 5: Quadratic Functions and Equations</b>  In this unit, you will explore quadratic equations and functions. You will see that when a quadratic equation is graphed, it forms a particular type of curve called a parabola. Some real-world situations can be modeled by parabolas—for example, the path a baseball makes when thrown up in the air. You will learn how to use multiple methods for solving quadratic equations including graphing, factoring, and applying the quadratic formula. Lastly, you will explore the set of complex numbers and quadratic systems.</p>	<p>N.CN.1, N.CN.2, N.CN.3, N.CN.4, N.CN.5, N.CN.6, N.CN.7, A.SSE.1b, A.SSE.2, A.SSE.3, A.SSE.3a, A.SSE.3b, A.CED.1, A.CED.2, A.CED.3, A.REI.4, A.REI.4a, A.REI.4b, A.REI.7, F.IF.4, F.IF.5, F.IF.7, F.IF.7a, F.IF.8, F.IF.8a, F.IF.9, F.BF.1, F.BF.3</p>	<ul style="list-style-type: none"> <li>• Identify and graph quadratic functions and transformations</li> <li>• Model and interpret real-world problems using quadratic equations</li> <li>• Write and solve quadratic equations by graphing, factoring, and using the quadratic formula</li> <li>• Identify, graph, and solve quadratic equations with complex solutions</li> <li>• Solve and graph systems of linear and quadratic equations and inequalities</li> </ul>
<p><b>Unit 6: Polynomials and Polynomial Functions</b>  Previously, you explored a specific type of polynomial, a quadratic polynomial. In this unit, you will explore a variety of polynomials, including monomials, binomials, and trinomials. You will learn how to identify and describe the properties of polynomials equations based on the powers of the variable terms they contain. In addition, you will learn methods to identify and represent factors, zeros, and x-intercepts of polynomial functions. You will identify the features of polynomial functions and their graphs and use them to model real-world situations such as maximizing the volume of a box and representing energy with power functions. You will also be introduced to methods and theorems that you will apply to solve polynomial equations.</p>	<p>N.CN.7, N.CN.8, N.CN.9, A.SSE.1, A.SSE.1a, A.SSE.1b, A.SSE.2, A.APR.1, A.APR.2, A.APR.3, A.APR.C.4, A.APR.5, F.IF.4, F.IF.7, F.IF.7c, F.IF.8, F.BF.3</p>	<ul style="list-style-type: none"> <li>• Identify the number of zeros and degree of a polynomial equation</li> <li>• Find zeros of a polynomial equation by factoring or graphing and finding x-intercepts</li> <li>• Write and use polynomial functions to solve problems</li> </ul>
<p><b>Unit 7: Exponential and Logarithmic Functions</b>  In this unit, you will explore two more types of functions, exponential and logarithmic. You will use exponential functions to model real-world situations and solve real-world problems, including problems involving interest and population growth or decay. You will also learn how using logarithms can help you solve exponential equations. Finally, you will learn to graph both exponential and logarithmic functions.</p>	<p>A.SSE.1, A.SSE.3, A.SSE.3c, A.CED.2, A.REI.11, F.IF.7, F.IF.7e, F.IF.8, F.IF.8a, F.IF.8b, F.BF.1, F.BF.4, F.BF.5, F.LE.1, F.LE.1a, F.LE.1c, F.LE.2, F.LE.3, F.LE.4, F.LE.5</p>	<ul style="list-style-type: none"> <li>• Model situations using exponential functions</li> <li>• Solve logarithmic equations using exponents</li> <li>• Solve exponential equations using logarithms</li> <li>• Graph exponential and logarithmic functions</li> </ul>
<p><b>Unit 8: Semester A Review and Exam</b>  In this unit, you will review concepts from Semester A in order to prepare for the semester exam, which you will take at the end of this unit.</p>		<ul style="list-style-type: none"> <li>• Students demonstrate their knowledge of the concepts covered in this course</li> </ul>