CPM Algebra 2 Textbook to Curriculum Map Alignment for CC Algebra 2
Algebra 2 – UNIT 1
Model and Reason with Equations and Expressions

Critical Area: Students use reasoning to analyze equations/ inequalities and develop strategies for solving them. Through reasoning students develop fluency writing, interpreting, analyzing and translating between various forms of linear equations and inequalities. By exploring a question about the world around them (mathematical modeling) and attempting to answer the question students expand the scope of algebraic operations to solve a wide variety of linear and quadratic real world problems. Students explain why the x-coordinates of the points where the graphs $y = f(x)$ and $y = g(x)$ intersects and explore cases involving polynomial, rational, absolute value, exponential, and logarithmic functions.

CLUSTER	COMMON CORE STATE STANDARDS	CPM MATH	OTHER RESOURCES
(m)Create equations that describe numbers or relationships.	**Algebra – Creating Equations** **A-CED.1**. Create equations and inequalities in one variable **including ones with absolute value** and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. **CA** ★ **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 non-viable options in a modeling context. **A-CED.4**. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. ★	MN: 4.2.2, 4.2.4 Checkpoint 9A 1-87, 1-107, 2-10, 2-120, 2-61, 2-87, 3-65, 3-123, 3-131, 4-8, 4-24, 4-41, 4-43, 4-94, 4-95, 4-101, 4-106, 4-110, 5-32, 7-60, 7-124, 8-15, 10-163, 11-58 2.1.1–2.1.5, 2.2.1, 2.2.2, 4.1.4, 6.1.1–6.1.5 MN: 4.2.4, 6.1.2, 6.1.4 2-4, 2-20, 2-87, 4-30, 4-57, 4-100, 4-107, 5-88, 6-21, 6-35, 6-64, 6-148, 6-81, 7-20, 7-44, 7-150, 9-15, 10-68, 10-96, 10-189, 10-190, 11-8 4.2.1–4.2.4 MN: 4.2.3, 4.2.4 Checkpoint 2B, Checkpoint 8A	**Illustrative Mathematics** • Buying a Car: A-CED.1 • Basketball: A-CED.1 & A-REI.2 • How Much Folate: A-CED.2 • Dimes and Quarters: A-CED.2 & A-CED.3 • Growing Coffee: A-CED.3 Bernado and Sylvia Play a Game: A-CED.3 • Clea on an Escalator: A-CED.2 • Equations and Formulas: A-CED.4 **Mars Task:** Optimization Problems: Boomerangs

		4-30, 4-40, 4-51, 4-65, 4-72, 4-74, 4-96, 4-99, 4-104, 4-107(b), 4-109, 7-151 5.1.3 Checkpoint 4B 1-37, 1-91, 2-113, 3-41, 4-32, 4-67, 4-87, 6-25, 11-80	

CPM Algebra 2 Textbook to Curriculum Map Alignment for CC Algebra 2

(m)Understand solving equations as a process of reasoning and explain the reasoning.	**Algebra – Reasoning with Equations and Inequalities** **A-REI.2.** Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.	4.1.1, 4.1.2 Checkpoint 8B, Checkpoint 11 3-96, 3-121, 4-27, 4-68, 4-95, 6-40, 6-53, 7-68, 7-122, 9-58, 9-80, 9-108, 10-100, 11-46, 11-81	Radical Equations: A-REI.2 **Mars Task:** Building and Solving Equations 2 Solving Linear Equations in Two Variables Sorting Equations and Identities Building and Solving Complex Equations
(m)Solve equations and inequalities in one variable.	**A-REI.3.1.** Solve one-variable equations and inequalities involving absolute value, graphing the solutions and interpreting them in context. CA	**n/a**	**Mars Task:** Representing Inequalities Graphically
(m)Represent and solve equations and inequalities graphically.	**A-REI.11.** Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★	4.1.2, 4.1.3, 4.2.4 4-7, 4-22, 4-23, 4-29, 4-30, 4-99, 7-42, 7-43, 8-160, 10-54	• **Illustrative Mathematics** Growth Rate: Given growth charts for the heights of girls and boys, students will use slope to approximate rates of change in the height of boys and girls at different ages. Students will use these approximations to plot graphs of the rate of change of height vs. age for boys and girls. Introduction to Polynomials - College Fund: A-REI.11

CPM Algebra 2 Textbook to Curriculum Map Alignment for CC Algebra 2
Algebra 2 – UNIT 2
Structure in Expressions and Arithmetic with Polynomials

Critical Area: Students connect the polynomial operations with the background knowledge of the algorithms found in multi-digit integer operations. Students realize that the operations on rational expressions (the arithmetic of rational expressions) are governed by the same rules as the arithmetic of rational numbers. Students analyze the structure in expressions and write them in equivalent forms. By modeling students expand the scope of algebraic operations to solve a wide variety of polynomial equations and real world problems. Students identify zeros of polynomials, including complex zeros of quadratic polynomials, and make connections between zeros of polynomials and solutions of polynomial equations. The role of factoring, as both an aid to the algebra and to the graphing of polynomials, is explored.

CLUSTER	COMMON CORE STATE STANDARDS	CPM MATH	OTHER RESOURCES
(m)Interpret the structure of expressions. **(m)Write expressions in equivalent forms to solve problems.**	**Algebra – Seeing Structure in Expressions** **A-SSE.1.** 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.* ★ **A-SSE.2.** Use the structure of an expression to identify ways to rewrite it. **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. *For example, calculate mortgage payments.* ★	2.2.2, 3.1.3 MN: 3.1.3, 8.1.1 2-109, 2-126, 2-148, 3-133, 6-27, 7-137, 7-141, 8-183, 10-57, 10-84 2.1.2– 2.1.5, 2.2.1, 2.2.2, 3.1.3, 4.1.1, 10.2.2 MN: 3.2.4, 10.3.2 Checkpoint 3A 2-23, 2-24, 2-40, 2-93, 3-32, 3-53, 3-67, 3-98, 3-105, 3-130, 5-39, 5-112, 5-128, 6-26, 6-87, 6-114, 7-27, 9-69, 12-104 3.1.1–3.1.3, 4.1.1, 8.3.2, 10.3.2 MN: 8.3.3 3-6, 3-23, 3-67, 3-98, 3-130, 5-134, 6-25, 8-143 10.1.1–10.1.4, 10.2.1, 10.2.2 MN: 10.1.2, 10.1.4, 10.2.2 10-87, 10-147, 10-148, 10-156, 10-169, 10-180, 10-182	**Mathematics Assessment Project** Generating Polynomials from Patterns Comparing Investments Solving Linear Equations in Two Variables Interpreting Algebraic Expressions **Illustrative Mathematics** • Animal Populations: A-SSE.1, 2 • Sum of Even and Odd: A-SSE.2 • Seeing Dots: A-SSE.1, 2 • Zeroes and factorization of a non-polynomial function: A-SSE.2 • Trina's Triangles:A-SSE.4 **Illuminations: NCTM** Light it Up!

(m)Perform arithmetic operations on polynomials.	**Algebra – Arithmetic with Polynomials and Rational Expressions** **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.	3.1.1–3.1.3, 3.2.1 Checkpoint 5A 3-23, 3-29, 5-37, 5-49, 6-87, 8-87, 9-14, 10-175. Operations with polynomials are also practiced extensively in implementing standards A-APR.6 and A-APR.7.	**Illuminations NCTM** Polynomial Puzzler Overhead
Understand the relationship between zeros and factors of 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.	8.3.1–8.3.3 MN: 8.3.2 8-148, 8-154, 8-175, 9-9 8.1.1–8.1.3, 8.3.2, 8.3.3 MN: 8.3.2 8-37, 8-106, 8-107, 8-143, 8-171, 8-179, 8-183, 8-186, 9-93, 10-38, 10-57	• Zeroes and factorization of a quadratic polynomial I: A-APR.2 Zeroes and factorization of a quadratic polynomial II: A-APR.2
Use polynomial identities to solve problems.	**A-APR.4.** Prove polynomial identities and use them to describe numerical relationships. *For example, the polynomial identity* $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ *can be used to generate Pythagorean triples.* **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.**(+)**	3.1.1–3.1.3, 10.3.1 2-24, 2-147 10.3.1 MN: 10.3.1 10-145, 10-146, 10-155, 10-171, 10-175, 10-187	
Rewrite rational expressions.	**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	8.3.1, 8.3.2 MN: 3.2.4, Checkpoint 3A 3-78, 3-91, 3-105, 3-130, 8-120, 8-124, 8-185, 9-54, 12-93, 12-110 3.2.2–3.2.5 MN: 3.2.2, 3.2.5 Checkpoints 6A and 6B	

	nonzero rational expression; add, subtract, multiply, and divide rational expressions.	3-90, 3-103, 3-130, 4-13, 5-31, 5-92, 6-13, 6-39, 6-73, 6-83, 6-114, 6-121, 6-145	

CPM Algebra 2 Textbook to Curriculum Map Alignment for CC Algebra 2
Algebra 2 – UNIT 3
FUNCTIONS

Critical Area: Instructional time should focus on relating arithmetic of rational expressions to arithmetic of rational numbers. Students identify zeros of polynomials, including complex zeros of quadratic polynomials, and make connections between zeros of polynomials and solutions of polynomial equations. Students will expand understandings of functions and graphing to include trigonometric functions. Building on their previous work with functions and on their work with trigonometric ratios and circles in the Geometry course, students now use the coordinate plane to extend trigonometry to model periodic phenomena. Students synthesize and generalize what they have learned about a variety of function families. They extend their work with exponential functions to include solving exponential equations with logarithms. They explore the effects of transformations on graphs of diverse functions, including functions arising in an application, in order to abstract the general principle that transformations on a graph always have the same effect regardless of the type of the underlying function.

CLUSTER	COMMON CORE STATE STANDARDS	CPM MATH	OTHER RESOURCES
(m) Interpreting functions that arise in applications in terms of the context	**Functions – Interpreting Functions** **F-IF.4**. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. *Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.* ★	1.1.2, 1.2.1, 1.2.2, 1.2.4, 2.1.3, 2.2.1, 5.2.3, 5.2.5, 8.1.1, 8.1.3 MN: 1.2.2 2-4, 2-109, 2-118, 2-131, 2-148, 3-30, 3-34, 3-133, 5-79, 5-104, 5-129, 6-132, 7-19, 7-112, 7-137, 7-141, 8-25, 8-95, 9-69	**Illustrative Mathematics** Running Time: F-IF.7c Graphs of Power Functions: F-IF.7c Exponentials and Logarithms II
	F-IF.5 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. ★	1.1.3, 1.2.1, 1.2.2, 4.2.2, 4.2.3, 5.1.2, 5.2.5, 8.3.3 MN: 1.1.3	**Mathematics Assessment Program** Interpreting Functions 1 Sorting Functions Skeleton Tower Best Buy Tickets
	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. ★	Checkpoint 3B 1-23, 1-34, 1-68, 1-109, 2-69, 2-81, 2-141, 3-118, 4-45, 5-62, 5-80, 7-4, 7-19, 7-24, 7-70, 7-134, 8-95, 10-130, 10-163	**Mathematics Vision Project** Polynomial Functions
(m) Analyze Functions Using Different Representations	**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. ★	1-112, 3-36, 3-55, 6-28	
	b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions. ★	1.1.3, 2.2.1, 2.2.2, 2.2.5 1-86, 2-52, 2-126, 2-131, 2-141,	

	c. Graph polynomial functions, identifying zeros 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. ★ **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.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	2-171, 3-34, 3-56, 3-133, 3-134, 5-127, 6-78, 7-29, 7-58, 7-85, 7-137 8.1.1–8.1.3, 8.3.2, 8.3.3 MN: 8.3.2 8-106, 8-107, 8-125, 8-138, 8-171, 8-183, 8-186, 9-9, 9-68, 9-93, 9-116, 10-38, 10-57, 10-151, 10-174 2.2.1, 2.2.2, 5.2.3, 5.2.4, 6.2.4, 7.1.2–7.1.4, 7.1.7, 7.2.1–7.2.4, 12.1.4 MN: 2.1.1 2-52, 5-89, 5-118, 6-27, 6-86, 6-116, 6-155, 7-141, 8-43, 8-146, 9-69, 10-92, 11-9 2.1.2–2.1.5 MN: 2.1.3, 2.1.4 Checkpoints 5B, 7A, and 7B 2-22, 2-36, 2-37, 2-50, 2-128, 2-166, 2-177, 3-31, 5-66, 5-76, 5-100, 5-134, 6-85, 7-9, 8-95, 9-25 10.3.2 MN: 2.1.1 Checkpoint 9A 2-29, 2-63, 2-85, 3-26(b), 3-49, 3-131, 6-15, 6-138, 7-20, 7-95, 8-23, 8-74, 9-38, 9-41, 10-96, 10-169, 11-101, 12-71. For implementation of properties of exponents in general, see standard A-SSE.1b.	

		1.1.4, 1.2.3, 2.1.2–2.1.4, 2.2.1–2.2.5, 5.2.4, 7.2.1–7.2.4 MN: 2.1.3 1-39, 1-127, 2-5, 3-34, 3-56, 3-84, 3-134, 4-99, 7-65, 7-142, 8-94	
(m) Build a function that models a relationship between two quantities **(s) Build new functions from existing functions**	**Functions – Building Functions** **F-BF.1** Write a function that describes a relationship between two quantities.★ b. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.*★ **F-BF.3** Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, 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. 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* $x \neq 1$	5.2.5, 6.2.3, 6.2.4 MN: 5.1.3 1-35, 1-71, 5-48, 5-112, 5-113, 5-116, 6-87, 6-141, 7-150 2.1.2–2.1.4, 2.2.1, 2.2.4, 2.2.5, 5.2.4, 7.2.1–7.2.4 MN: 2.2.2, 2.2.3, 2.2.5 2-70, 2-74, 2-107, 2-109, 2-118, 2-125, 2-143, 2-148, 2-163, 2-164, 2-165, 2-174, 3-30, 3-54, 3-83, 3-133, 3-134, 6-27, 6-42, 6-86, 6-154, 7-129, 7-137, 7-141, 7-150, 7-158, 10-190 5.1.1–5.1.3, 5.2.1, 5.2.2 Checkpoint 9B 5-8, 5-26, 5-51, 5-62, 5-127, 5-129, 6-136, 7-85, 7-97, 8-77, 8-142, 9-92	**Inside Mathematics** Measuring Mammals- F-BF.4 **Illustrative Mathematics** Exponentials and Logarithms I: F-BF.4 **Mars Task:** Table Tiles Representing Polynomials Graphically **Mathematics Vision Project:** Functions and Their Inverses Logarithmic Functions
(s) Construct and	**Functions – Linear, Quadratic, and Exponential**		**Illustrative Mathematics**

compare linear, quadratic, and exponential models and solve problems	**Models** **F-LE.4** For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where *a*, *c*, and *d* are numbers and the base *b* is 2, 10, or *e*; evaluate the logarithm using technology. ★[Logarithms as solutions for exponentials.] **4.1 Prove simple laws of logarithms. CA ★** **4.2 Use the definition of logarithms to translate between logarithms in any base. CA ★**	5.2.1, 5.2.2, 6.2.1–6.2.4, 10.3.2 MN: 6.2.2 Checkpoint 10 5-74, 5-85, 5-97, 5-103, 6-11, 6-113, 6-151, 7-80, 7-149, 7-174, 10-56, 10-103, 11-10, 11-45, 11-59	Bacteria Populations: F-LE.4 **Illuminations:** Logarithms Demystified **Mars Task** Representing Polynomials Graphically Having Kittens Representing Functions of Everyday Situations
(s) Perform arithmetic operations with complex numbers **(s) Use complex numbers in polynomial identities and equations.** [Polynomials with real coefficients.]	**Number and Quantity – Complex Number System** **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.7** Solve quadratic equations with real coefficients that have complex solutions. **N-CN.8** (+) Extend polynomial identities to the complex numbers. *For example, rewrite* $x^2 + 4$ *as* $(x + 2i)(x – 2i)$. **N-CN.9** (+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	8.2.1–8.2.3 8-70, 8-72, 8-76, 8-90, 8-140, 8-156, 10-53, 10-131 8.2.2, 8.2.3 8-71, 8-72, 8-90, 8-111, 8-184, 9-57, 10-104, 11-69 8.2.1–8.2.3 8-88, 8-110, 8-143, 8-154, 8-171, 8-181, 8-186, 8-190, 9-55, 10-101(b), 10-124 8.2.2, 8-171, 8.3.2 MN: 8.3.2 8-87, 8-187, 9-14 8.1.1, 8.1.2, 8.2.1–8.2.3, 8.3.1–8.3.3 MN: 8.3.2 8-104, 8-105, 8-106, 8-125, 8-143, 8-170, 8-180, 8-182, 8-186	**Illustrative Mathematics** Complex number patterns: N-CN.1 Powers of a complex number: N-CN.2 Completing the square: N-CN.7; A-REI.4 **Mars Task** Evaluating Statements about Radicals

CPM Algebra 2 Textbook to Curriculum Map Alignment for CC Algebra 2
Algebra 2 – UNIT 4
Geometry and Trigonometry

Critical Area: Students use algebraic manipulation, including completing the square, as a tool for geometric understanding to determine if the equation represents a circle or a parabola. They graph shapes and relate the graphs to the behavior of the functions with the transformation on the variable (e.g. the graph of y=f (x+2). Students expand on their understanding of the trigonometric functions first developed in Geometry to explore the graphs of trigonometric functions with attention to the connection between the unit circle representation of the trigonometric functions and their properties, use trigonometric functions to model periodic phenomena. Students use Pythagorean identity to find the trig function outputs given the angle and understand that interpretation of sine and cosine yield the Pythagorean Identity.

CLUSTER	COMMON CORE STATE STANDARDS	CPM MATH	OTHER RESOURCES
Translate between the geometric description and the equation for a conic section	**Geometry – Expressing Geometry Properties with Equations** **G-GPE.3.1.** Given a quadratic equation of the form $ax^2 + by^2 + cx + dy + e = 0$, use the method for completing the square to put the equation into standard form; identify whether the graph of the equation is a circle, ellipse, parabola, or hyperbola, and graph the equation. [In Algebra II, this standard addresses circles and parabolas only.] CA	**n/a**	**Illustrative Mathematics Resources**: Explaining the equation for a circle:G-GPE.3 **Miscellaneous Sources** Gravel Roads and Sinusoidal Patterns: **Mathematics Vision Project:** Circles and other Conics
Extend the domain of the trigonometric functions using the unit circle	**Functions – Trigonometric Functions** **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.2.1.** Graph all 6 basic trigonometric functions.	7.1.5 MN: 7.1.5 7-92, 7-104, 7-161, 9-44 7.1.6 MN: 7.1.6, 7.1.7 7-37, 7-54, 7-63, 7-64, 7-92, 7-104, 7-162, 7-169, 9-44, 10-69	**Illustrative Mathematics Resources** Trig Functions and the Unit Circle : F-TF.2 **NCTM Illuminations** Graphs from the Unit Circle: F-TF.1, 2 As the Wheel Turns **Mathematics Vision Project** Trigonometric Functions Modeling with Functions
Model periodic phenomena with trigonometric functions	**F-TF.5.** Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. ★	7.1.1, 7.1.2, 7.2.1–7.2.4 MN: 7.2.4 7-65, 7-117, 7-119, 7-129, 7-130, 7-158, 8-25, 8-189, 12-98	**Illustrative Mathematics Resources** • Foxes and Rabbits Intro • Foxes and Rabbits 2 • Foxes and Rabbits 3: F-TF.5

			Dan Meyer Scrambler **Mars Task** • Representing Trigonometric Functions
Prove and apply trigonometric identities	**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.	7.1.4, 12.2.1 MN: 7.1.7 7-53, 7-64, 7-96, 7-110, 9-79, 12-100, 12-114 Standards F-TF.9+ (and F-TF.6+) are introduced in Lessons 12.1.1–12.1.3 and 12.2.2–12.2.3.	

CPM Algebra 2 Textbook to Curriculum Map Alignment for CC Algebra 2
Algebra 2 – UNIT 5
Statistics and Probability

Critical Area:

Students analyze data to make sound statistical decisions based on probability models. By investigating examples of simulations of experiments and observing outcomes of the data, students gain an understanding of what it means for a model to fit a particular data set. Students develop a statistical question in the form of a hypothesis (supposition) about a population parameter, choose a probability model for collecting data relevant to that parameter, collect data, and compare the results seen in the data with what is expected under the hypothesis. Students build on their understanding of data distributions to help see how the normal distribution uses area to make estimates of frequencies (which can be expressed as probabilities). In addition, they can learn through examples the empirical rule, that for a normally distributed data set, 68% of the data lies within one standard deviation of the mean, and that 95% are within two standard deviations of the mean.

CLUSTER	COMMON CORE STATE STANDARDS	CPM MATH	OTHER RESOURCES
(s)Summarize, represent, and interpret data on a single count or measurement data.	**Statistics and Probability – Interpreting Categorical and Quantitative Data** **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	9.3.1–9.3.3 MN: 9.3.1, 9.3.3 9-88, 9-104, 9-105, 10-12, 10-41, 10-67, 11-6, 11-20	**Illustrative Mathematics:** SAT Score: S.ID.4 Do You Fit In This Car?: S.ID.4 Should We Send Out a Certificate?: S.ID.4 **Mars Task** Representing Data with Frequency Graphs Representing Data with Box Plots
Understand and evaluate random processes underlying statistical experiments.	**Statistics and Probability – Making Inferences and Justifying Conclusions** **S.IC.1.** Understand statistics as a process for making inferences to be made 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. *For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?*	9.1.2, 9.1.3, 11.2.1 MN: 9.1.1 9-7, 9-23, 9-36, 9-52, 9-62, 9-104, 9-115, 11-21, 11-43, 11-66, 11-98, 11-105 9.3.2, 11.1.1, 11.1.2 11-18, 11-19, 11-29	**Illustrative Mathematics:** School Advisory Panel: S-IC.1 Musical Preferences: S-IC.1, S-ID.5 **Mathematics Vision Project** Statistics **Georgia Standards** Advanced Algebra Unit 1: Inferences and Conclusions from Data

Make inferences and justify conclusions from sample surveys experiments, and observational studies.	**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.5.** 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**.**	9.1.2, 9.2.1, 9.2.2 MN: 9.2.1 9-36, 9-51, 9-62, 9-63, 9-76, 9-89, 9-90, 9-113, 11-30 9.1.3, 9.3.2, 11.1.3, 11.2.1 MN: 11.2.2, 11.2.3 11-42, 11-64, 11-66, 11-75, 11-77, 11-98, 11-100 11.2.1–11.2.3 MN: 11.2.3 9-24, 9-89, 11-65, 11-76 9.1.1, 9.2.1, 9.2.2, 11.3.1 9-7, 9-22, 9-23, 9-24(d), 9-38, 9-50, 9-64, 9-75, 9-112, 11-54, 11-98, 11-105	**Illustrative Mathematics:** Strict Parents: S-IC.1, 3 Musical Preferences: S-IC.1, S-ID.5 **Mars Task** **Interpreting Data: Muddying the Waters** Devising a Measure: Correlation
Use probability to evaluate outcomes of decisions.	**Statistics and Probability – Using Probability to Make Decisions** **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).	11.2.4, 11.3.1 11-18, 11-20, 11-55, 11-87, 11-96, portfolio entry in Chapter 11. 11.2.4, 11.3.1 11-7, 11-28, 11-29, 11-66, 11-67, 11-77, 11-78, 11-87, 11-88, 11-96, 11-98, 12-35, 12-51, portfolio entry in Chapter 11.	**Inside Mathematics:** Fair Games