Algebra 1 Curriculum Map
2016-17

2015 Florida St

Algebra and Modeling (41%)

Functions and Modeling (40%)
Statistics and the Number System (19%)

First Nine Weeks

Sequence	Standard Description	Resources	Ass

Week 1 - 2 (Q1)
8/24/15 - 9/2/15
	Unit 1: Constructing Graphs and Multiple Representations in the Real World
	
	MAFS.912.N-Q.1.1
	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
	
	MAFS.912.N-Q.1.2
	Define appropriate quantities for the purpose of descriptive modeling.
	
	MAFS.912.A-CED.1.1 Calculator: Neutral
	Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions.
	
	MAFS.912.A-CED.1.2 Calculator: Neutral
	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
	
	MAFS.912.A-CED.1.3 Calculator: Neutral
	~~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.*
	
	MAFS.912.F-IF.2.5 Calculator: Neutral
	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.
	
	MAFS.912.F-BF.1.1 Calculator: Neutral
	Write a function that describes a relationship between two quantities.
	   a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
	   a. ~~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.*~~
	   b. ~~Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*~~
	
	LAFS.910.SL.1.3
	Evaluate a speaker's point of view, reasoning, and use of
		Textbook: Sections 1-1, 1-2, 1-7, 1-8, 1-9, 4-2, 4-6,
		
		CPALMS Lessons:
		
		Key Vocabulary:
		Domain, Range, independent variable, dependent variable, discrete, continuous, scale, symbolic representation, numerical representation, concrete representation, verbal representation, graphical representation, equivalent representation, function
		
		Conceptual Knowledge:
		*Scale and Intervals of Graphs
		*Domain and Range
		*Independent and Dependent Variables
		*Discrete and Continuous Data
		*Multiple Representations
		*Distributive Property
		
		Skills:
		~Using data to construct graphs with varying intervals and determine which is appropriate.
		~Distinguish between independent and dependent variables.
		~Identify the domain and range.
		~Simplify expressions by using order of operations.
		~Create representations of relationships among quantities using concrete models, tables, graphs equations and verbal descriptions.
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evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.

Standards of Mathematical Practices
SMP 1 Make sense of problem and preserve in solving them
SMP 4 Model with mathematics
SMP 5 Use appropriate tools strategically
SMP 6 Attend to precision
SMP 8 Look for and express regularity in repeated reasoning.

Week 2 - 4(Q1) **9/3/15 - 9/16/15**	**Unit 2: Functions**	**Algebra Nation**	
	MAFS.912.A-CED.1.1 Calculator: Neutral Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions. **MAFS.912.A-CED.1.2** Calculator: Neutral Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **MAFS.912.A-REI.2.3** Calculator: Neutral Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **MAFS.912.F-IF.1.1** Calculator: Neutral 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 to the input *x.* The graph of *f* is the graph of the equation *y=f(x).* **MAFS.912.F-IF.1.2** Calculator: Neutral Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. **MAFS.912.F-IF.1.3** Calculator: Neutral Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-- 1) for n≥ 1.* **MAFS.912.F-IF.2.4** Calculator: No 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.* **MAFS.912.F-IF.2.5** Calculator: Neutral 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--*	**Textbook:** 4-1, 4-2, 4-3, 4-4, 4-6, 4-7 **CPALMS Lessons:** **Picture This** 912.F-IF.1.1 **- Introduction to Functions** **Key Vocabulary:** Function, function notation, input, output, independent variable, dependent variable, recursive definition, sequence, term **Conceptual Knowledge:** *Functional Relationships *Function Notation *Independent Variables *Dependent Variables **Skills**: ~Evaluate functions using order of operations. ~Construct tables and graphs of linear functions ~Compare and contrast functional and nonfunctional relationships ~Distinguish between independent and dependent variables	**Forma Asses** **Forma Asses** **Forma Asses** **Forma Asses** **Forma Asses**

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	hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function. **MAFS.912.F-IF.3.9** Calculator: No Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables or by verbal descriptions). For example, given a graph of one quadratic function and on algebraic expression for another, say which has the larger maximum. **Standards of Mathematical Practices** SMP 3 Construct viable arguments and critique the reasoning of others SMP 6 Attend to precision		**Forma Asses** **Forma Asses**
Week 4 - 5 (Q1) **9/17/15 -** **9/24/15**	**Unit 3: Exploring Rate of Change in Motion Problems** **MAFS.912.N-Q.1.1** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. **MAFS.912.N-Q.1.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. **MAFS.912.F-IF.2.4** Calculator: No 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.* **MAFS.912.F-IF.2.6** Calculator: Neutral Calculate and interpret the average rate of change of a function (presented symbolically or as a graph) over a specified interval. Estimate the rate of change from a graph. **LAFS.910.RST.3.7** Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. **Standards of Mathematical Practices** SMP 4 Model with mathematics SMP 5 Use appropriate tools strategically SMP 6 Attend to precision	**Textbook:** 5-1, **CPALMS Lessons:** **Key Vocabulary:** Rate of change, speed, steepness, horizontal, vertical **Conceptual Knowledge:** *Rate of change *Constant Rates *Motion Graphs **Skills**: ~Demonstrate an understanding that speed is an example of rate. ~Compare different constant rates and find rates from tables and graphs. ~Show the effect a change in speed has on a graph.	 **Forma Asses**

Week 5 - 7 (Q1)
9/25/15 -
10/05/15
	Unit 4: Exploring Rate of Change in other situations
	
	MAFS.912.N-Q.1.1
	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
	
	MAFS.912.F-IF.2.4 Calculator: No
	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.*
	
	MAFS.912.F-IF.2.6 Calculator: Neutral
	Calculate and interpret the average rate of change of a function (presented symbolically or as a graph) over a specified interval. Estimate the rate of change from a graph.
	
	MAFS.912.F-LE.1.1 Calculator: No
	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.
	
	LAFS.910.SL.1.1
	
	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
	
	    a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
	    b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed.
	    c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into
		Textbook: 5-1, 5-2,
		
		Key Vocabulary:
		Inverse variation, proportional relationships, non-constant rate of change, direct variation, constant of proportionality
		
		Conceptual Knowledge:
		*Rate of change
		*Direct Variation
		*Identify different types of functions
		
		Skills:
		~Calculate rates of change using first differences.
		~Identify proportional relationships and key features of direct variation.
		~Classify functions based on their rates of change.
			**Forma
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	the discussion; and clarify, verify, or challenge ideas and conclusions. d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented. **Standards of Mathematical Practices** SMP 1 Make sense of problem and preserve in solving them SMP 6 Attend to precision SMP 7 Look for and make use of structure SMP 8 Look for and express regularity and repeated reasoning.			

Week 7 - 9 (Q1)
10/6/15 -
10/20/15
	Unit 5: Moving Beyond Slope Intercept Form
	MAFS.912.F-IF.2.6 Calculator: Neutral
	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.
	
	MAFS.912.F-IF.3.7 Calculator: Neutral
	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph linear and quadratic functions and show intercepts, maxima, and minima.
	
	MAFS.912.F-BF.1.1 Calculator: Neutral
	Write a function that describes a relationship between two quantities. Determine an explicit expression, a recursive process, or steps for calculation from a context. Combine standard function types using arithmetic operations.
	
	MAFS.912.F-BF.2.3 Calculator: Neutral
	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.
	
	MAFS.912.F-LE.1.1 Calculator: No
	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.
	
	MAFS.912.F-LE.1.2 Calculator: Neutral
		Textbook: 5-3, 5-4, 5-5, 5-6,
		
		Key Vocabulary:
		Slope, y-intercept, x-intercept, zero of a function, parallel, perpendicular, slope intercept, standard form, point-slope form
		
		Conceptual Knowledge:
		*Slope
		*x and y intercepts
		*Slope intercept form
		*standard form
		*point slope form
		
		Skills:
		~Calculate and interpret slope in a given situation
		~Identify lines as parallel and perpendicular according to their slope.
		~Identify and interpret x and y intercepts in a given situation.
		~Find and use the equations of lines in slope intercept form, standard form and point-slope form
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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).

MAFS.912.F-LE.2.5 Calculator: No

Interpret the parameters in a linear or exponential function in terms of a context.

MAFS.912.S-ID.3.7 Calculator: Neutral

Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

LAFS.910.SL.1.2

Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.

LAFS.910.WHST.2.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Standards of Mathematical Practice:
SMP 1 Make sense of problem and preserve in solving them. .
SMP 6 Attend to precision.
SMP 7 Look for and make use of structure

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End of First Nine Weeks Exam

Professional Day

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Second Nine Weeks

Sequence	Standard Description	Resources	Ass
Week 1 - 2 (Q2) **10/26/15 -** **11/5/15**	**Unit 6: Solving Linear Equations and Inequalities** **MAFS.912.A-CED.1.1** Calculator: Neutral Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions. **MAFS.912.A-CED.1.2** Calculator: Neutral Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **MAFS.912.A-CED.1.3** Calculator: Neutral 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. **MAFS.912.A-CED.1.4** Calculator: Neutral Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. **MAFS.912.A-REI.1.1** Calculator: No 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. **MAFS.912.A-REI.2.3** Calculator: Neutral Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. **MAFS.912.A.REI.4.10** Calculator: Neutral 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). **MAFS.912.A-REI.4.11** Calculator: Neutral 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. **MAFS.912.A-REI.4.12** Calculator: Neutral 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. **Standards of Mathematical Practice:** SMP 1 Make sense of problem and preserve in solving them. SMP 3 Construct viable arguments and critique the reasoning of others. SMP 4 Model with mathematics. SMP 5 Use appropriate tools strategically. SMP 6 Attend to precision.	**Textbook:** 2-2, 2-3, 2-4, 2-5, 3-1, 3-2, 3-3, 3-4, CB 5-5, 6-5, **CPALMS Lessons:** **Key Vocabulary:** Linear inequality in one, Linear inequality in two, variables, equality, equations, inverse functions, inverse operation **Conceptual Knowledge:** *Solving linear equations and inequalities *Inverse functions *Graphing inequalities in two variables **Skills**: ~Solving multi-step equations (including literal equations) ~Checking the solution and justifying the solution to equations and inequalities ~Find the inverse of linear functions ~Graph inequalities in two variables to show the solution set	**EOC** **SPEC** **Forma** **Asses** **Forma** **Asses**

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| **Week 2 - 3 (Q2)**
 11/6/15 -
 11/13/15 | **Unit 7: Systems of Linear Equations and Inequalities**

 MAFS.912.A-CED.1.3 Calculator: Neutral
 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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*

 MAFS.912.A-REI.3.6 Calculator: Neutral

 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

 MAFS.912.A-REI.4.12 Calculator: Neutral
 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.

 Standards of Mathematical Practice:
 SMP 1 Make sense of problem and preserve in solving them.
 SMP 3 Construct viable arguments and critique the reasoning of others.
 SMP 4 Model with mathematics.
 SMP 5 Use appropriate tools strategically.
 SMP 6 Attend to precision. | **Textbook:** 6-1, 6-4, 6-6

 CPALMS Lessons:

 Key Vocabulary:
 System of equations and inequalities, system of linear equations and inequalities in two variables, solution, satisy the equation and inequality, no solution

 Conceptual Knowledge:
 *Systems of Equation
 *Systems of Inequalities
 * Solution to Systems

 Skills:
 ~Write a system of equations and inequalities to model a situation
 ~Solve a system of equations by making a table or a graph
 ~Solve a system of inequality by graphing and finding the intersection
 ~Check and interpret solutions of systems | **MFAS** |
| **Week 4 (Q2)**
 11/16/15 -
 11/20/15 | **Unit 8: Other Methods for Solving Systems**

 MAFS.912.A-CED.1.3 Calculator: Neutral
 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.

 MAFS.912.A-REI.3.5 Calculator: Neutral
 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.

 MAFS.912.A-REI.3.6 Calculator: Neutral
 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

 MAFS.912.A-REI.4.12 Calculator: Neutral
 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. | **Textbook:** 6-2, 6-3

 Key Vocabulary:
 System of equations in two variables, substitution, linear combination, dependent equations, independent equations, consistent equations, inconsistent equations

 Conceptual Knowledge:
 *Solving systems using substitution
 *Solving systems using linear combination method | |

Standards of Mathematical Practice:
SMP 1 Make sense of problem and preserve in solving them.
SMP 3 Construct viable arguments and critique the reasoning of others.
SMP 5 Use appropriate tools strategically.
SMP 6 Attend to precision.
SMP 7 Look for and make use of structure.

Skills:
~Solving systems of equations algebraically
~Checking and justifying solutions to systems of equations
~Identifying which method is most effective in a given situation

Skills:
~Solving systems of equations algebraically
~Checking and justifying solutions to systems of equations

Week 5-7 (Q2)
 11/23/15 -
 12/7/15
	Unit 9: Creating Linear models for Data
	
	 MAFS.912.N-Q.1.1
	 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
	
	 MAFS.912.N-Q.1.2
	 Define appropriate quantities for the purpose of descriptive modeling.
	
	 MAFS.912.N-Q.1.3
	 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
	
	 MAFS.912.F-IF.3.7 Calculator: Neutral
	 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, and using phase shift.
	
	 MAFS.912.A-REI.4.10 Calculator: Neutral
	 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).
	
	 MAFS.912.F-IF.2.5 Calculator: Neutral
	 Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
	
	 MAFS.912.F-BF.1.1 Calculator: Neutral
	 Write a function that describes a relationship between two quantities.
	   a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
	   b. Combine standard function types using arithmetic operations.
	   c. Compose functions.
	
	 MAFS.912.F-BF.2.3 Calculator: Neutral
	 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
		Textbook: 5-7,
		
		 Key Vocabulary:
		 Positive correlation, negative correlation, tend line, parent function, transformation, line of best fit, regression, r-value
		
		 Conceptual Knowledge:
		 *Write equations of a trend line from data
		 *Assess whether data is approximately linear
		 *Explain transformations from the parent function
		 *Use technology to determine the line of best fit.
		
		 Skills:
		 ~Write equations of a trend line from data
		 ~Assess whether data is approximately linear
		 ~Explain transformations from the parent function
		 ~Use technology to determine the line of best fit

negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.

MAFS.912.F-LE.1.2 Calculator:Neutral
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).

MAFS.912.S-ID.2.6 Calculator: Neutral
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 linear, and exponential models.*
      b. Informally assess the fit of a function by plotting and analyzing residuals.
Fit a linear function for a scatter plot that suggests a linear association.

Standards of Mathematical Practice:
SMP 1 Make sense of problem and preserve in solving them.
SMP 2 Reason abstractly and quantitatively.
SMP 3 Construct viable arguments and critique the reasoning of others.
SMP 4 Model with mathematics.
SMP 5 Use appropriate tools strategically.
SMP 8 Look for and express regularity and repeated reasoning.

Week 7-8 (Q2) **12/8/15 -** **12/15/15**	**Unit 10: Descriptive Statistics** **MAFS.912.S-ID.1.1** Calculator: Neutral Represent data with plots on the real number line (dot plots, histograms, and box plots). **MAFS.912.S-ID.1.2** Calculator: Neutral 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. **MAFS.912.S-ID.1.3** Calculator: Neutral Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). **MAFS.912.S-ID.2.5** Calculator: Yes Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data. Standards of Mathematical Practice: SMP 2 Reason abstractly and quantitatively. SMP 4 Model with mathematics. SMP 5 Use appropriate tools strategically. SMP 6 Attend to precision. SMP 7 Look for and make use of structure. SMP 8 Look for and express regularity and repeated reasoning.	**Textbook:** 12-2, 12-3, 12-4,
End of Second Nine Week Exam		
Winter Break: December 19 - January 3		
Professional Day		

Algebra and Modeling (41%) *Functions and Modeling (40%)*
Statistics and the Number System (19%)

Third Nine Weeks

Sequence	Standard Description	Resources	Ass
Week 1 - 3 (Q3) **1/5/16 - 1/22/15**	**Unit 11: Exponential Functions and Equations** **MAFS.912.N-RN.1.1** Calculator: No 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. **MAFS.912.N-RN.1.2** Rewrite expressions involving radicals and rational exponents using the properties of exponents. **MAFS.912.A-CED.1.1** Calculator: Neutral Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic function s, and simple rational, absolute, and exponential functions. **MAFS.912.A-CED.1.2** Calculator: Neutral Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **MAFS.912.A-SSE.2.3** Calculator: Neutral 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 **MAFS.912.F-IF.3.7** Calculator: Neutral 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, and using phase shift. **MAFS.912.F-BF.1.1** Calculator: Neutral Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic	**Textbook:** 7-1, 7-2, 7-3, 7-4, 7-5, 7-6, 7-7, 7-8 **CPALMS Lessons:** **Key Vocabulary:** Linear function, exponential function, y-intercept, constant rate of change, rational exponent, exponents **Conceptual Knowledge:** *Exponential Functions *Exponential Growth *Exponential Decay *Rational Expressions *Exponents **Skills**: ~Recognize exponential patterns and represent them algebraically ~Represent and analyze situations involving exponential growth and decay.	**EOC** **SPEC** **MFAS**

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.*
b. Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*

MAFS.912.F- LE.1.1 Calculator: No
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.

MAFS.912.F-LE.1.2 Calculator: Neutral
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).

MAFS.912.F-LE.1.3 Calculator: No
Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically or (more generally) as a polynomial function.

MAFS.912.F-LE.2.5 Calculator: Neutral
Interpret the parameters in a linear or exponential function in terms of a context.

MAFS.912.S-ID.2.6 Calculator: Neutral
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 linear, and exponential models.*
   b.   Informally assess the fit of a function by plotting and analyzing residuals. Fit a linear function for a scatter plot that suggests a linear association.
Standards of Mathematical Practice:
SMP 1 Make sense of problem and preserve in
solving them.
SMP 5 Use appropriate tools strategically.
SMP 7 Look for and make use of structure.
SMP 8 Look for and express regularity and repeated reasoning.

MAFS.912.F- LE.1.1 Calculator: No

Algebra and Modeling (41%)   *Functions and Modeling (40%)*
Statistics and the Number System (19%)

Week 4- 5 (Q3) 1/25/16 - 2/2/16	**Unit 12: Graphs of Quadratic Functions**	**Textbook:** 9-1, 9-2,	**MFAS**
	MAFS.912.A-CED.1.2 Calculator: Neutral Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	**CPALMS Lessons:**	

	MAFS.912.F-IF.3.7 Calculator: Neutral
	 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, and using phase shift.
		Key Vocabulary:
		 Quadratic function, parent function, general form, parabola, vertex, vertices, y-intercept
		
		 Conceptual Knowledge:
		 *Quadratic parent function
		 *Domain and Range of a quadratic function
		 *$y=ax^2+c$
		
		 Skills:
		 ~Identify and sketch the quadratic parent function
		 ~Determine the domain and range that make sense in given situations
		 ~Describe effects of changes of *a* & *c* on a graph	

	MAFS.912.F-BF.1.1 Calculator: Neutral
	 Write a function that describes a relationship between two quantities.
	     a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
	     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.*
	     c. Compose functions.		

	MAFS.912.F-BF.2.3 Calculator: Neutral 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. **Standards of Mathematical Practice:** SMP 4 Model with mathematics. SMP 5 Use appropriate tools strategically. SMP 6 Attend to precision. SMP 7 Look for and make use of structure. SMP 8 Look for and express regularity and repeated reasoning.		
Week 5 - 7(Q3) 2/3/16 - 2/19/16	**Unit 13: Operations of Polynomials**	**Textbook:** 8-1, 8-2, 8-3, 8-4, 8-5, 8-6, 8-7, 8-8	**MFAS**

	MAFS.912.A-SSE.1.1 Calculator: Neutral
	 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.
		CPALMS Lessons:	

	MAFS.912.A-SSE.1.2 Calculator: Neutral Use the structure of an expression to identify ways to rewrite it.	**Key Vocabulary:**	

	MAFS.912.A-SSE.2.3 Calculator: Neutral 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. **MAFS.912.A-APR.1.1** Calculator: No 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. **MAFS.912.A-APR.2.3** Calculator:Neutral 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. **Standards of Mathematical Practice:** SMP 1 Make sense of problem and preserve in solving them. SMP 2 Reason abstractly and quantitatively. SMP 4 Model with mathematics. SMP 7 Look for and make use of structure.	Polynomial, monomial, binomial, trinomial, coefficient, terms, degree, distributive property, difference of squares **Conceptual Knowledge:** *Type and degree of polynomials. *Operations on polynomials. *Factoring *Simplify radical expressions **Skills**: ~Classify polynomials by type and degree ~Multiply monomials and binomials ~Using the undoing process to apply factoring ~Add, Subtract and multiply rational expressions	
Week 7 - 9 (Q3) **2/22/16 - 3/8/16**	**Unit 14: Modeling with Quadratic Functions** **MAFS.912.A-CED.1.2** Calculator: Neutral Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. **MAFS.912.A-SSE.2.3** Calculator: Neutral 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. **MAFS.912.F-IF.2.4** Calculator: No 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. **MAFS.912.F-IF.3.7** Calculator: Neutral 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	**Textbook:** 9-1, 9-2 **CPALMS Lessons:** **Key Vocabulary:** Quadratic function, parabola, vertex, axis of symmetry **Conceptual Knowledge:** *Analyze graphs of quadratic functions *General form of quadratic functions *Convert a quadratic from general to vertex form **Skills**: ~Explain how *a*, *h*, & *k* affect the shape of the parabola ~Describe shifts on a graph ~Identify the vertex using a table ~Completing the squareMAFS-912-F-IF.3.07.e	MFAS

~~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, and using phase shift.

MAFS.912.F-IF.3.8 Calculator: Neutral
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

MAFS.912.F-BF.1.1 Calculator: Neutral
Write a function that describes a relationship between two quantities.
a. Determine an explicit expression, a recursive process, or steps for calculation from a context.
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.*
~~c. Compose functions.~~

MAFS.912.F-BF.2.3 Calculator: Neutral
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.

MAFS.912.S-ID.2.6 Calculator: Neutral
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 linear,*
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.

LAFS.910.WHST.1.1
Write arguments focused on *discipline-specific content.*
a.Introduce precise claim(s), distinguish the claim(s) from alternate or opposing
claims, and create an organization that establishes clear relationships among
the claim(s), counterclaims, reasons, and evidence.
b. Develop claim(s) and counterclaims fairly, supplying data and evidence for
each while pointing out the strengths and limitations of both claim(s) and
counterclaims in a discipline-appropriate form and in a manner that anticipates
the audience's knowledge level and concerns.

   c. Use words, phrases, and clauses to link the major sections of the text,
     create cohesion, and clarify the relationships between claim(s) and reasons,
     between reasons and evidence, and between claim(s) and counterclaims.
   d. Establish and maintain a formal style and objective tone while attending to the
     norms and conventions of the discipline in which they are writing.
   e. Provide a concluding statement or section that follows from or supports the
     argument presented.
Standards of Mathematical Practice:
SMP 2 Reason abstractly and quantitatively.
SMP 4 Model with mathematics.
SMP 5 Use appropriate tools strategically.
SMP 6 Attend to precision.
SMP 7 Look for and make use of structure.

End Third Nine Week Exam

Professional Day

Spring Break: March 12 - March 20

Algebra and Modeling (41%)   *Functions and Modeling (40%)*
Statistics and the Number System (19%)

Fourth Nine Weeks

Sequence	Standard Description	Resources	Ass
Week 1 - 3 (Q4) **3/21/16 - 4/1/16**	**Unit 15: Solving Quadratic Equations** **MAFS.912.A-CED.1.1** Calculator:Neutral Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational, absolute, and exponential functions. **MAFS.912.A-SSE.2.3** Calculator: Neutral 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. **MAFS.912.A-APR.2.3** Calculator: Neutral 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. **MAFS.912.A-REI.4.11** Calculator: Neutral 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. **MAFS.912.A-REI.2.4** Calculator:Neutral 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 $a \pm bi$ for real numbers a and b. **MAFS.912.F-IF.3.7** Calculator:Neutral 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	**Textbook:** 9-3, 9-4, 9-5, 9-6, **CPALMS Lessons:** **Key Vocabulary:** Roots, solutions, x-intercepts, zeros **Conceptual Knowledge:** *Quadratic functions *Solutions to quadratic functions **Skills**: ~Solve by graphing, factoring and completing the square ~Identify and make connections among factors, roots, zeros and x-intercepts as solutions to quadratic functions	**EOC I** **SPEC** **MFAS**

		Textbook:	MFAS
	~~period, midline, and amplitude, and using phase shift.~~ **Standards of Mathematical Practice:** SMP 1 Make sense of problem and preserve in solving them. SMP 3 Construct viable arguments and critique the reasoning of others. SMP 4 Model with mathematics. SMP 5 Use appropriate tools strategically. SMP 6 Attend to precision.		

Week 3 - 4 (Q4)
 4/6/16 - 4/12/16
	Unit 16:The Quadratic Formula
	
	 MAFS.912.N-RN.2.3 Calculator: No
	 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.
	
	 MAFS.912.A-REI.2.4 Calculator: Neutral
	 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 $a \pm bi$ for real numbers a and b.
	
	 LAFS.910.WHST.1.1
	 Write arguments focused on *discipline-specific content.*
	      a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.
	      b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.
	      c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.
	      d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.
	      e. Provide a concluding statement or section that follows from or supports the argument presented.
	 Standards of Mathematical Practice:
	 SMP 1 Make sense of problem and preserve in solving them.
	 SMP 4 Model with mathematics.
	 SMP 5 Use appropriate tools strategically.
	 SMP 6 Attend to precision.
	 SMP 7 Look for and make use of structure.
		Textbook:
		
		 CPALMS Lessons:
		
		 Key Vocabulary:
		 Whole number, integer, rational number, irrational number, complex number, real number, roots, x-intercepts, solutions, zerod
		
		 Conceptual Knowledge:
		 *Quadratic functions
		 *Solutions to quadratic functions
		 *Real Numbers
		 *Identify the components of the quadratic formula
		
		 Skills:
		 ~Solving the quadratic formula
		 ~Identify and make connections among factors, roots, zeros, and x-intercepts as solutions to quadratic functions
		 ~Classify numbers as natural, whole, integer, rational, and irrational
		 ~Use discriminant to tell how many solutions	

Algebra and Modeling (41%)   *Functions and Modeling (40%)*
                                                                          Statistics and the Number System (19%)

Week 4 - 7 (Q4) **4/13/16 - 5/6/16**	**EOC REVIEW**		
Week 9 - 12 (Q4) **5/16/16 - 6/8/16**	**Connecting Algebra and Geometry**		
End of Fourth Nine Weeks			
End of School Year			