BMS Pacing

Algebra I- At a Glance

2015-2016

Module 1: Solving Equations and Inequalities **20 days**
• Solving equations
  ○ Simple
  ○ Multi-step
  ○ Variables on both sides
• Solve literal equations
  ○ Especially those that solve for *y*
• Solve absolute value equations
• Solve multi-step inequalities (KCS Mod 3)
• Solve compound inequalities (KCS Mod 3)
• Solve absolute value inequalities (KCS Mod 3)
	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 ~~and exponential functions.~~
	
	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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*
	
	A-CED.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law V=IR to highlight resistance R.*
	
	ACT Course Standards
	
	-Solve formulas for a specified variable
	
	A-REI.A.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.B.3 Solve linear equations and inequalities in one

	variable, including equations with coefficients represented by letters. **ACT Course Standard** -Use rational numbers to demonstrate knowledge of additive and multiplicative inverses -Simplify Ratios -Apply Algebraic Properties (e.g. commutative, associative, distributive, identity, inverse, substitution) to simplify algebraic expressions. -Solve single-step and multistep equations and inequalities in one variable -Graph linear inequalities in one variable on the real number line to solve problems **N-Q.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.)~~ **N-RN.3** Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is

	irrational.
Module 2: Linear Equations and Inequalities **17 days** • Graphing linear equations • Slope ○ From graph, table, ordered pairs • Slope-intercept form • Standard form • Write equations in slope-intercept form • Point-slope form • Line of best fit • Compare two linear functions • Graph linear inequalities (KCS Mod 3)	**A-REI.D.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.D.11** Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ 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.~~ **ACT Course Standard** -Add, subtract, multiply, and divide rational numbers, including integers, fractions, and decimals, without calculators -Translate real-world problems into

	expressions using variables to represent values **A-CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. * **F-IF.B.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~~. ★★ **F-IF.C.9** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for

	another, say which has the larger maximum.

Module 3: Linear Functions (KCS Module 5) **15 days**
• Determine if relation is a function
  ○ Mapping
  ○ Vertical line test
• Function notation
• Write a function rule from: table, pattern, arithmetic sequence, functional values,
• Compare two functions
• Arithmetic sequences
• Linear vs nonlinear
• Piecewise Functions and functional values
	F-IF.A.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.A.2 Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of context.
	
	F-IF.B.5 Relate the domain of a function to its graph and, where applicable to the

	quantitative relationship that it describes. *For example, if the function h(n) gives the number of person hours it takes to assemble n engines in the factory, then the positive integers would be an appropriate domain of the function.* **F-IF.A.3** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by* $f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1)\ for\ n >= 1$ **ACT Course Standards** -Evaluate functions at given values **F-IF.C.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases★★. b. Graph square root, cube root and piecewise-defined functions, including step

	functions and absolute value functions. **ACT Course Standards** -Give the domain and range of relations and functions -Identify graphs of relations and functions and analyze them to determine whether a relation is a function (e.g., vertical line test) -Translate between different representations of relations and functions: graphs, equations, sets of ordered pairs, verbal descriptions, and tables -Identify arithmetic sequences and patterns in a set of data -Identify patterns of growth (e.g., patterns of exponential growth) in a set of data **F-BF.A.1a** Determine an explicit expression, a recursive process, or steps for calculation from a context. ★★ **A-SSE.A.1** Interpret expressions that represent a quantity in terms of its context★★*. a. Interpret parts of an expression, such as terms, factors, and

	coefficients.
Module 5: Exponential Equations and Functions (KCS Module 6) 17 days • Rules of exponents • Scientific notation • Graphing • Geometric sequences • Regression	
Module 6: Polynomial Equations and Factoring (KCS Module 7) 16 days • Operations with polynomials • Special products • Solve polynomial equations in factored form • Zero product property • Factor and solve	

Module 7: Graphing and Solving Quadratic Functions (KCS Module 8) 17 days
• Graph quadratics
  ○ Standard form
  ○ Vertex form
• Solving quadratics
  ○ Graphing
  ○ Square roots
  ○ Factoring
  ○ Completing the square	

○ Quadratic formula • Compare linear, exponential, and quadratic functions • Use completing the square to convert between standard and vertex form • Analyze the discriminant	
Mini Unit– (Part of KCS Module 5) 3 days • Graph special functions ○ Absolute value (pay particular attention to transformations) ○ Step	
Module 4: Systems of Equations (KCS Module 4) 14 days • Solve systems ○ Graphically ○ Substitution ○ Elimination • Graph system of inequalities	
Module 10: Probability and Statistics (KCS Module 11) 11 days	

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Module 9: Rational Equations and Functions (KCS Module 10) 12 days • Simplify rational expressions • Multiply/divide rational expressions • Graph rational functions • Solve rational equations (proportions)	
Module 8: Square Root Functions and Geometry (KCS Module 9) 13 days • Simplify radicals • Add, subtract, multiply radicals • Pythagorean theorem • Distance and midpoint • Graph radical functions	