ALGEBRA 2 CURRICULUM

Course 17006

The main portion of this course broadens the topics that were first seen in Algebra I. The students will continue to study probability and statistics along with a variety of functions. With successful completion of this course, the student will be properly prepared for a Trigonometry course.

ALGEBRA 2 OUTLINE:

Goals	Skills	Summative Assessments	Time Frame	Main Resources
 Apply the order of operations in computation and in problem-solving situations. Simplify expressions involving polynomials. Describe and/or determine change. Analyze and/or use patterns or relations. Describe and/or determine families of functions. Analyze and/or interpret data on a scatter plot and/or use a scatter plot to make predictions. Apply probability to practical situations. 	 Represent and/or use imaginary numbers in equivalent forms (e.g., square roots and exponents). Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. Write and/or solve non-linear equations using various methods. Create, interpret, and/or use polynomial, exponential, and/or logarithmic functions and their equations, graphs, or tables. 	Mid-year and End of Year Benchmark Assessments,	1-year	Glencoe Algebra 2 ©2014

ALGEBRA 2 MAP:

TIME	BIG IDEAS	CONCEPTS	ESSENTIAL	STANDARDS	OBJECTIVES	DIFFERENTIATION	ASSESSMENT
FRAME Week 1-2: Chapter 1: Equations and Inequalities	 Symbols allow you to express mathematical concepts in a condensed form. Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions. 	 1.1 Expressions and Formulas 1.2 Properties of Real Numbers 1.3 Solving Equations 1.4 Solving Absolute Value Equations 1.5 Solving Inequalities 1.6 Solving Compound and Absolute Value Inequalities 	QUESTIONS • How are symbols useful in mathematics? • How can expressions, equations, and inequalities be used to quantify, solve, model, and/or analyze mathematical situations? • How are relationships represented mathematically?	 A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3 Simplify/reduce a rational algebraic expression. A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only). A1.1.3.1.1 Write or solve compound inequalities and/or graph their solution sets on a number line (may include absolute value inequalities). A1.1.3.1.2 Identify or graph the solution set to a linear inequality on a number line. A1.1.3.2.2 Interpret solutions to 	 1.1: Use the order of operations to evaluate expressions Use formulas 1.2: Classify real numbers Use the properties of real numbers to evaluate expressions. 1.3: Translate verbal expressions into algebraic expressions and equations, and vice versa. Solve equations using the properties of equality 1.4: Evaluate expressions involving absolute values. Solve absolute value equations 1.5: Solve one-step inequalities. Solve multi-step inequalities. Solve absolute value inequalities 	 Leveled Worksheets (Study Guide and Intervention) Skills Practice, Practice, Word Problems Practice, Enrich 	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

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				problems in the context of the problem situation			
				(systems of 2 linear			
				inequalities only).			
				A2.1.2.2.1			
				Factor algebraic			
				expressions, including			
				difference of squares and trinomials (trinomials			
				limited to the form			
				ax2+bx+c where a is not			
				equal to 0).			
				A2.1.2.2.2			
				Simplify rational			
				algebraic expressions.			
				A2.1.3.2.2			
				Use algebraic processes			
				to solve a formula for a given variable (e.g.,			
				solve $d = rt$ for r).			
				CC.2.2.HS.D.1			
				Interpret the structure of expressions to represent			
				a quantity in terms of its			
				context.			
				CC.2.2.HS.D.7			
				Create and graph			
				equations or inequalities			
				to describe numbers or relationships.			
Week 3 &	You can	2.1 Relations and	How can	A1.1.1.5.1	• 2.1: Analyze	Leveled	Homework
4: Chapter	represent	Functions	mathematical ideas	Add, subtract and/or	relations and	Worksheets	(Teacher
2: Linear Relations	mathematical	2.2 Linear Relations	be represented?	multiply polynomial expressions (express	functions	(Study Guide and	Editions, Suggested HW
and	ideas verbally, algebraically,	and Functions	 What is the relationship 	answers in simplest form	 Use equations of relations and 	Intervention)	at beginning of
Functions	numerically and		between input and	 nothing larger than a 	functions	 Skills Practice, Practice, Word 	each problem
	graphically.	2.3 Rate of Change	output values in a	binomial multiplied by a	• Extend 2.1:	Problems	set)
	 Functions describe the 	and Slope	function?How does knowing	trinomial).	Use discrete and continuous	 Practice, Enrich 	Participation
	relationship	2.4 Writing Linear	parent functions	A1.1.1.5.2	continuous functions to solve		
	between a set of	Equations	and transformations	Factor algebraic	real-world problems		Quiz (Mid
	input values and a set of output	2.5 Scattter Plots	allow you to make	expressions, including difference of squares	2.2: Identify linear		Chapter Quiz/Test)
	values.	and Lines of	generalizations about the function?	and trinomials (trinomials	relations and functions		
	 Identifying parent 	Regression	 What real-life 	limited to the form	Write linear		Tests (Form 1,
	functions and	2.6 Special	situations can be	ax2+bx+c where a is equal to 1 after factoring	equations in		2A, 2B, 2C)
	their	Functions	modeled using	out all monomial factors).	standard form		

transformations helps students classify and make generalizations about functions2.7 Parent Functions and Transformationsequations? inequalities?A1.1.1.5.3 Simplify/reduce a rational algebraic expression.Extend 2.2: Distinguish among roots, solutions and zeros2.8 Graphing Linear and Absolute Value inequalities2.8 Graphing Linear and Absolute Value inequalitiesA1.2.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.Extend 2.2: Distinguish among zerosExtend 2.2: Distinguish among zeros41.2.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.A1.2.1.1.3 lithe pattern and represent the pattern and represent tabel).Write an equation of a line parallel or perpendicular to a given ine2.5: Use scatter plots and prediction countineeA1.2.1.2.1 Create, interpret and/orCs: Use scatter plots and prediction countinee	
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• Would using	
function	
Extend 2.5: Explore	
A1.2.1.2.2 the difference	
Translate from one between correlation	
representation of a linear and causation	
function to another	
(graph, table and variables	
equation). • 2.6: Write and	
graph piecewise-	
A1.2.2.1.1 defined functions	
Identify, describe and/or use constant rates of step and absolute	
use constant rates of	
change. • Explore 2.7: Use a	
Apply the concept of to determine how linear rate of change changing the	
(slope) to solve parameters m and b	
problems.	
of functions	
A1.2.2.1.3 • 2.7: Identify and	
Write or identify a linear use parent	
equation when given the functions	
graph of the line 2 points • Describe	
on the line, or the slope transformations of	
and a point on a line, functions	
(Linear equation may be • 2.8: Graph linear	
in point-slope, standard inequalities	1

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			and/or slope-intercept	 Graph absolute 	
			form).	value inequalities	
			A1.2.2.1.4		
			Determine the slope		
			and/or y-intercept		
			represented by a linear		
			equation or graph.		
			A2.1.2.2.1		
			Factor algebraic		
			expressions, including		
			difference of squares		
			difference of squares		
			and trinomials (trinomials		
			limited to the form		
			ax2+bx+c where a is not		
			equal to 0).		
			- •		
			A2.1.2.2.2		
			Simplify rational		
			algebraic expressions.		
			algebraic expressions.		
			A2.1.3.1.1		
			Write and/or solve		
			quadratic equations		
			(including factoring and		
			using the Quadratic		
			Formula).		
			i officiale):		
			A2.1.3.1.2		
			Solve equations		
			involving rational and/or		
			radical expressions (e.g.,		
			10/(x + 3) + 12/(x - 2) =		
			1 or √(x2 + 21x) = 14).		
			· / /		
			A2.1.3.1.4		
			Write, solve and/or apply		
			linear or exponential		
			growth or decay		
			(including problem		
			situations).		
			A2.1.3.2.1		
			Determine how a change		
			in one variable relates to		
			a change in a second		
			variable (e.g., y=4/x, if x		
			doubles, what happens		
			to y?).		
			A2.1.3.2.2		
		•			

Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for f). A2.2.1.11 Analyze 3 set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. A2.2.1.1.2 Identify and/or extend a pattern as either an aritimetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). A2.2.1.1.3 Determine the domain, range or inverse of a reliation. A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the								
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or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). Image: CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make								
(e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make					exponential, quadratic,			
increasing/decreasing, intercepts, zeros, and asymptotes). CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make								
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CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make								
CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make								
Graph and analyze functions and use their properties to make					asymptotes).			
Graph and analyze functions and use their properties to make					CC.2.2.HS.C.2			
functions and use their properties to make								
properties to make								
connections between the								
different representations.					different representations.			
CC.2.2.HS.D.1								
Interpret the structure of expressions to represent								
a quantity in terms of its					a quantity in terms of its			
context.								
Weeks 5-9 • You can find the Explore Lesson 3.1: • How can you find A1.1.2.1.1 • Explore 3.1 Find • If students Homework	Weeks 5-9	You can find the	Explore Lesson 3.1:	How can you find		Explore 3.1 Find	 If students 	Homework
Systems of solution to a math Graphing the solution to a Write, solve and/or apply intersections of demonstrate an (Teacher						intersections of		
Equations problem by using Technology Lab: math problem? a linear equation graphs using a understanding of Editions,								
and Intersections of In	and	. , , , ,	Intersections of		(including problem		, , , , , , , , , , , , , , , , , , ,	Suggested HW

La source l'étais		Que e la c		- : : : : : : : : : : : : : : : : : : :		have to supply a	at he advantage of
Inequalities	a graph;	Graphs	 What are the 	situations).	graphing calculator	how to graph a	at beginning of
	analyzing a table		benefits of having		 3.1 Solve systems 	system of	each problem
	of values; solving	3.1: Solving	different strategies	A1.1.2.1.2	of linear equations	equations and find	set)
	an equation;	Systems of	for solving systems	Use and/or identify an	graphically.	the point of	
	guessing and	Equations	of equations?	algebraic property to	 Solve systems of 	intersection,	Participation
	checking.		 What are the 	justify any step in an	linear equations	Then have them	
	 Having different 	3.2: Solving	advantages of	equation solving process	algebraically.	create a list of tips	Quiz (Mid
	strategies for	Systems of	using matrices to	(linear equations only).	 3.2 Solve systems 	to help someone	Chapter
	solving systems	Inequalities by		(inteal equations emy):		draw the graphs	Quiz/Test)
			solve problems?	A1.1.2.1.3	of inequalities by		Quiz/Test)
	of equations	Graphing	 What happens if 		graphing.	for a system of	Tasta (Farma 4
	allows you to use		you choose to test	Interpret solutions to	 Determine the 	equations and find	Tests (Form 1,
	the strategy that	Extend Lesson 3.2:	a point on the	problems in the context	coordinates of the	the point of	2A, 2B, 2C)
	is most efficient.	Graphing	boundary?	of the problem situation	vertices of a region	intersection easily	
	For example, if	Technology Lab:	 Does the slope 	(linear equations only).	formed by the graph	and efficiently.	
	an estimate of	Systems of Linear	change when a		of a system of	 Logical Learners 	
1	the solution is	Inequalities	linear function is	A1.1.2.2.1	inequalities.	Have students	
	sufficient,		translated?	Write and/or solve a	Extend 3.2 Use a	summarize the	
1	graphing can be	3.3: Optimization	 How does a stretch 	system of linear	graphing calculator	various algebraic	
	used. You can	with Linear		equations (including		methods for	
	use algebraic	Programming	or compression	problem situations) using	to solve systems of	solving a system	
	methods to find	riogrammig	affect the function	graphing, substitution	linear inequalities		
	exact solutions.	3.4: Systems of	rule?	and/or elimination (limit	 3.3 Find the 	of equations using	
			 Why is the line 		maximum and	if-then statements	
	 Matrices provide 	Equations in Three	called a line of best	systems to 2 linear	minimum values of	and examples.	
	a convenient way	Variables	fit if there are other	equations).	a function over a	Sample: If one of	
	to organize data;		ways to draw a line		region.	the equations has	
	they can be used	Explore Lesson 3.5:	through the data?	A1.1.2.2.2	 Solve real-world 	a variable with a	
	to shorten	Spreadsheet Lab:	Would you be	Interpret solutions to	optimization	coefficient of 1	
	notation;	Organizing Data with	surprised if the	problems in the context	problems using	(such as $x + 3y =$	
	technology can	Matrices	correlation	of the problem situation	linear programming.	9 or $5x + y = 13$),	
	be used to			(systems of 2 linear		then consider the	
	quickly perform	3.5: Operations with	coefficient for this	equations only).	3.4 Solve systems	substitution	
	matrix	Matrices	data were 0.09?		of linear equations	method.	
	operations.		 How do you 	A1.1.3.1.1	in three variables.	Extension Give an	
	-	3.6: Multiplying	combine the	Write or solve compound	 Solve real-world 		
	Transforming	Matrices	solutions to the two	inequalities and/or graph	problems using	example of a	
	linear functions	Matrices	inequalities to find		systems of linear	system of	
	allows students	Extend Longer 2.6:	the solution when	their solution sets on a	equations in three	equations that has	
	to compare	Extend Lesson 3.6:	the compound	number line (may include	variables.	infinitely many	
	different but	Graphing	inequality is a	absolute value	Explore 3.5	solutions.	
1	related functions	Technology Lab:	disjunction? a	inequalities).	Organize and	 If students 	
1	at once on the	Operations with	conjunction?		display data using	demonstrate an	
1	same coordinate	Matrices	What linear	A1.1.3.1.2	matrices and	understanding of	
1	plane.			Identify or graph the		how to solve a	
1	Linear regression	3.7: Solving	equations make up	solution set to a linear	spreadsheets	system of	
1	is used to find a	Systems of	each part of the	inequality on a number	 3.5 Analyze data in 	inequalities by	
	linear model that	Equations Using	graph of the two	line.	matrices.	graphing,	
1	describes a	Cramer's Rule	transformations?		 Perform algebraic 	graphing,	
1			 How can you 	A1.1.3.1.3	operations with	Then have there	
	general trend in	3.8: Solving	sketch the graph of	Interpret solutions to	matrices.	Then have them	
1	real-world data.	Systems of	the transformation	problems in the context	 3.6 Multiply 	write a list of tips	
1	 Absolute-value 	Equations using	without making a	of the problem situation	matrices.	to help someone	
1	equations and		table of values?		 Use the properties 	draw the graphs of	
1	inequalities are	Inverse Matrices		(limit to linear	of matrix	systems of	
				inequalities).			

often used to	Extend Lesson 3.8:		multiplication.	inequalities and
model real-world	d Graphing	A1.1.3.2.1	 Extend 3.6 Use a 	find the vertices
situations	Technology Lab:	Write and/or solve a	graphing calculator	easily and
involving distance	e Augmented Matrices	system of linear	to explore	efficiently.
or tolerance	-	inequalities using	operations with	Intrapersonal
levels.		graphing (limit systems	matrices.	Learners For
		to 2 linear inequalities).	 3.7 Evaluate 	Exercises 25–27,
			determinants.	37, and 38, tell
		A1.1.3.2.2	 Solve systems of 	students that
		Interpret solutions to	linear equations by	systems of
		problems in the context	using Cramer's	inequalities are
		of the problem situation	Rule.	often used to solve
		(systems of 2 linear	 3.8 Find the 	real-world
		inequalities only).	inverse of a 2 × 2	problems.
			matrix.	Challenge
		A2.1.3.1.1	Write and solve	students to search
		Write and/or solve	 write and solve matrix equations for 	newspapers,
		quadratic equations	a system of	magazines, and
		(including factoring and	equations.	the Internet for
		using the Quadratic	 Extend 3.8 Use a 	real-world
		Formula).	 Extend 3.8 Use a graphing calculator 	information and
		,	and the augmented	use that
		A2.1.3.1.2		information to
		Solve equations	matrix for a system	write a real-world
		involving rational and/or	of equations to	problem that can
		radical expressions (e.g.,	solve the system.	be solved using a
		10/(x + 3) + 12/(x - 2) =		system of
		1 or $\sqrt{(x^2 + 21x)} = 14$).		inequalities. This
				will help students
		A2.1.3.1.3		to better
		Write and/or solve a		understand the
		simple exponential or		concept of solving
		logarithmic equation		systems of
		(including common and		inequalities.
		natural logarithms).		Extension Plot
				the points $(-2, 0)$,
		A2.1.3.1.4		(0, 2), and (2, 0).
		Write, solve and/or apply		Draw line
		linear or exponential		segments
		growth or decay		connecting the
		(including problem		points to form a
		situations).		triangular region.
		,		Write a system of
		A2.1.3.2.1		inequalities that
		Determine how a change		defines the region.
		in one variable relates to		$y \ge 0, y \le -x + 2, y$
		a change in a second		$\leq x+2$
		variable (e.g., y=4/x, if x		If students have
		doubles, what happens		trouble with the
		to y?).		relationship
				between the
		A2.1.3.2.2		
· ·		·		

Use algebraic processes	different regions of
to solve a formula for a	a graph of a
given variable (e.g.,	system of
solve $d = rt$ for r).	inequalities,
	Then have
A2.2.2.1.1	students use
Create, interpret and/or	different colored
use the equation, graph	pencils to shade
or table of a polynomial	the different
function (including	regions of a graph
quadratics).	defined by the
	inequalities in a
A2.2.2.1.2	linear
Create, interpret and/or	programming
use the equation, graph	problem. This
or table of an	should help
exponential or	students clarify the
logarithmic function	relationship
(including common and	between the
natural logarithms).	
haturai logantinns).	various regions in
A2.2.2.1.3	these graphs
	Extension Linear
Determine, use and/or	programming is a
interpret minimum and	great lens for
maximum values over a	looking at effective
specified interval of a	business practice.
graph of a polynomial,	Ask students to
exponential or	create a business
logarithmic function.	similar to those
	mentioned in the
A2.2.2.1.4	Exercises.
Translate a polynomial,	Students must
exponential or	determine their
logarithmic function from	costs and profits
one representation to	for the chosen
another (graph, table	business and
and equation).	analyze the
	information to
CC.2.2.HS.D.10	determine
Represent, solve and	maximum profit
interpret	options. Make the
equations/inequalities	task more
and systems of	authentic by
equations/inequalities	having students
algebraically and	pursue a business
graphically.	that is of personal
5	interest to them
CC.2.2.HS.D.7	and estimate profit
Create and graph	margins using the
equations or inequalities	Internet as a
to describe numbers or	
relationships.	resource.

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				 If some students 	
				struggle with	
				solving real-world	
				problems using	
				systems of	
				equations in three	
				variables,	
				Then pair those	
				students with	
				students that are	
				having success.	
				Encourage	
				students to explain	
				to partners their	
				explorations and	
ļ				plans for solving	
ļ				real-world	
ļ				problems using	
ļ				systems of three	
ļ				equations in three	
				variables. Suggest	
				that the listening	
				partner take notes	
				about the	
				speaking partner's	
				strategies, asking	
				questions as	
				needed for	
				clarification.	
				Extension The	
				values in the table	
				represent the	
				sums of each row	
				and column. Have	
				students find the	
ļ				missing value.	
				Then have	
				students identify	
ļ				the values for	
ļ				each symbol or set	
				of symbols. (Hint:	
ļ				Let each symbol	
				or set of symbols	
				represent one	
ļ				variable.)	
ļ				Verbal/Linguistic	
ļ				Learners Students	
ļ				may find it helpful	
ļ				to talk softly or	
ļ				to talk softly, or	
ļ				even silently, to	
1 1				themselves as	

	I				
				they work with	
				matrices. For	
				example, they	
				might recite the	
				words "row by	
				column" to remind	
				themselves how to	
				write the	
				dimensions of a	
				matrix. When	
				multiplying by a	
				scalar, students	
				may find it helps to	
				say, for example,	
				"5 times 1 is 5,	
				and 5 times	
				negative 3 is	
				negative 15." In	
				this way, students	
				uns way, students	
				use more than one	
				of their senses to	
				check their	
				calculations.	
				 If students need 	
				more practice with	
				matrices,	
				•	
				Then have them	
				use the class	
				seating	
				arrangement to	
				form matrices, with	
				each student's	
				desk as an	
				element. Have	
				students make 24	
				large cards	
				showing the	
				values for the	
				elements of two	
				matrices. Form	
				two matrices A4 ×	
				3 and B3 × 4with	
				student seats and	
				give each student	
				sitting in these	
				"matrices" a card	
				to show the	
				element in that	
1	1	1			
				position. Have	
				position. Have students model	

			the matrix
			multiplication AB =
			C. Begin by
			drawing a blank 4
			× 4 matrix on the
			board. For each
			element on matrix
			C, have students
			walk out the
			products, compute
			the sums, and
			then write the
			results in the
			correct locations of
			the matrix on the
			board.
			If students are
			using evaluation
			by diagonals for
			the first time,
			•
			Then urge them to
			write down each
			step in the
			procedure. Have
			them compare
			their work with
			classmates to find
			any errors in either
			their calculations
			or their use of the
			procedure.
			If students wish to
			review the process
			of the
			manipulation of
			matrices,
			•
			Then ask students
			to write a brief
			reflection on their
			reactions to the
			various methods they have learned
			involving the
			monipulation of
			manipulation of
			matrices. Ask
			them to comment
			on what aspects
			they found efficient
			and helpful, and

Week 10- 12 Quadratic Functions and Relations• From the placement of a quadratic graph, you can see whether there are 0, 1, or 2 real solutions. The symmetry of the graph helps you identify a second solution when one solution is found.• If the equation has terms that you could solve by factoring. If the equation has more complex terms, you could solve by using the Quadratic Formula, completing the square, or by graphing. You could also use one method to solve and a	 4.1: Graphing Quadratic Functions Extend 4.1: Graphing Technology Lab: Modeling Real- World Data 4.2: Solving Quadratic Equations by Graphing Extend 4.2: Solving Quadratic Equations by Graphing 4.3: Solving Quadratic Equations by Factoring 4.4: Complex Numbers Extend 4-4: Algebra Lab: The Complex Number Plane 4-5: Completing the Square 	 How can the graph of a quadratic function help you solve the corresponding quadratic equation? How do you know what method to use when solving a quadratic equation? 	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3 Simplify/reduce a rational algebraic expression. A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations).	 4.1 Graph quadratic functions. Find and interpret the maximum and minimum values of a quadratic function. Extend 4.1 Use a graphing calculator to model data points for which the curve of best fit is a quadratic function. 4.2 Solve quadratic equations by graphing. Estimate solutions of quadratic equations by graphing. Extend 4.2 Use a graphing calculator to solve quadratic equations. 4.3 Write quadratic equations. 4.3 Write quadratic equations in standard form. Solve quadratic equations by factoring. 4.4 Perform 	 what aspects they found to be difficult or confusing. Logical Learners Ask each student to write a comparison of the inverse of a matrix to the multiplicative and additive inverses of a number. If students struggle to solve real-world problems involving maximum or minimum values, Then encourage students to explain to partners their plans for solving. Suggest that the listening partner take notes about the speaking partner's strategies, asking questions as needed for clarification. Visual/Spatial Learners Provide students to sort the parabolas. Ask students to sort the parabolas into three piles: those that model a quadratic equation with one real solution, those that 	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)
one method to				 factoring. 4.4 Perform operations with pure imaginary numbers. Perform operations with complex 	with one real	
	4.6: The Quadratic Formula and the		A1.1.2.1.3	numbers.Extend 4.4 Graph complex numbers in	solutions. Finally, ask students to	

			· · · · · · · · · · · · · · · · · · ·
Discriminant	Interpret solutions to	the complex plane	name the real
	problems in the context	and determine	solutions for those
Explore 4-7:	of the problem situation	absolute values of	in the piles having
Graphing	(linear equations only).	complex numbers.	real solutions.
Technology Lab:		• 4.5 Solve quadratic	Extension Tell
Families of	A1.1.2.2.1	equations by using	students that they
Parabolas	Write and/or solve a	the Square Root	can solve absolute
	system of linear	Property.	value equations by
4-7: Transformations	equations (including	Solve quadratic	graphing just as
of Quadratic Graphs	problem situations) using	equations by	they solve
	graphing, substitution	completing the	quadratic
Extend 4-7: Algebra	and/or elimination (limit	square.	equations by
Lab: Quadratics and	systems to 2 linear	Extend 4.5 Use a	graphing. Write
Rate of Change	equations).	calculator	the following
		containing a	equations on the
4-8: Quadratic	A1.1.2.2.2		board:
Inequalities	Interpret solutions to	computer algebra	x + 1 = 0
moquantos	problems in the context	system to solve	x + 1 = 0 x - 4 - 1 = 0
Extend 4-8:	of the problem situation	quadratic	x - 4 - 1 = 0 Have students use
Graphing	(systems of 2 linear	equations.	
Technology Lab:	equations only).	Extend 4.6 Solve	a graphing
	equations only).	quadratic equations	calculator to graph
Modeling Motion		by using the	the related
	A1.1.3.1.1	Quadratic Formula.	absolute value
	Write or solve compound	Use the	function for each
	inequalities and/or graph	discriminant to	equation. Then
	their solution sets on a	determine the	have them use the
	number line (may include	number and type of	ZERO feature
	absolute value	roots of a quadratic	from the CALC
	inequalities).	equation.	menu to find its
		Explore 4.7 Use a	real solutions, if
	A1.1.3.1.2	graphing calculator	any, rounded to
	Identify or graph the	to investigate	the nearest
	solution set to a linear	changes to	hundredth. –1; 3, 5
	inequality on a number	parabolas.	If students think
	line.		that the steps in
		• 4.7 Write a	Example 1 provide
	A1.1.3.1.3	quadratic function in	the only possible
	Interpret solutions to	the form $y = a(x - b)^2$	equation for the
	problems in the context	$(h)^{2} + k.$	given roots, then
	of the problem situation	Transform graphs	provide each
	(limit to linear	of quadratic	student with a
	inequalities).	functions of the	
		form $y = a(x - h)^2 +$	sheet of grid
	A11221	<i>k</i> .	paper. Have
	A1.1.3.2.1	• 4.7 Write a	students begin by
	Write and/or solve a	quadratic function in	drawing a
	system of linear	the form $y = a(x - x)$	coordinate grid
	inequalities using	$(h)^{2} + k.$	with two points on
	graphing (limit systems	Transform graphs	the x-axis plotted
	to 2 linear inequalities).	of quadratic	as the roots of a
			quadratic
		tunctions of the	
	A1.1.3.2.2 Interpret solutions to	functions of the form $y = a(x - h)^2 +$	equation. Ask

· · · · · · · · · · · · · · · · · · ·		
		udents to draw
		veral parabolas
		at might be the
		aphs of different
		uations having
	, ,	ose two points
		their solutions.
		bint out that this
		monstrates that
		e steps shown in
		ample 1 yield
		st one of the
		ssible equations
		ving the given
		ots.
		students need
		lp remembering
		e mathematical
		aracteristics of i,
		en have udents write
	table)	ems about the aginary number
		nd the repeating
		lues of its
		wers, perhaps
		cluding wordplay
		th the terms real
		d imaginary.
		e content of the
		ems should be
		lpful for
		membering the
		athematical
		aracteristics of i.
		tension Tell
		idents that you
		e thinking of two
		mplex numbers
		at have a sum of
	change. 3	+ i and a
		ference of –5 +
		Ask them to
	Apply the concept of fin	d the product of
		e two numbers.
		+ 19i
	problems. • Ve	erbal/Linguistic
	Le	arners Have
		udents solve the
		uation x2 + 6x –
	equation when given the 40	= 0 by
	graph of the line 2 points	

on the line, or the slope	completing the
and a point on a line,	square. Then have
(Linear equation may be	them discuss with
in point-slope, standard	a partner as many
and/or slope-intercept	ways as they can
form).	to check their
	solutions.
A1.2.2.1.4	 If students
Determine the slope	substitute values
and/or y-intercept	into the Quadratic
represented by a linear	Formula
equation or graph.	incorrectly, then
	encourage
A2.1.1.1.1	students to write
Simplify square roots in	down the values of
terms of i. (e.g., $\sqrt{-24} =$	a, b, and c from
2i√6).	the standard form
	of the quadratic
A2.1.1.1.2	equation before
Simplify/evaluate	they begin
expressions involving	substituting them
imaginary numbers	into the formula.
powers of i (e.g., i6 + i3	 Intrapersonal
= -1 + i).	Learners Have
A2.1.1.2.1	students observe
Add and subtract	or research some
complex numbers (e.g.,	natural events that
(7 - 3i) - (2 + i) = 5 - 4i).	can be modeled
	by parabolas.
A2.1.1.2.2	Students should
Multiply and divide	report their
complex numbers (e.g.,	observations and
(7 - 3i)(2 + i) = 17 + i).	findings to the
	class. If students
A2.1.2.2.1	are able to
Factor algebraic	determine a
expressions, including	quadratic function
difference of squares	that models the
and trinomials (trinomials	event, they should
limited to the form	present the
ax2+bx+c where a is not	function and
equal to 0).	explain how the
	characteristics of
A2.1.2.2.2	the equation can
Simplify rational	be used to analyze
algebraic expressions.	its graph.
	Extension In this
A2.1.3.1.1	lesson on
Write and/or solve	quadratic
quadratic equations	functions, only
(including factoring and	equations of
using the Quadratic	

	Formula).	parabolas that
		open upward or
	A2.1.3.1.2	downward are
	Solve equations	analyzed and
	involving rational and/or	graphed. Ask
	radical expressions (e.g.,	students to explain
	10/(x + 3) + 12/(x - 2) =	why parabolas
	1 or $\sqrt{(x^2 + 21x)} = 14$).	opening to the
		right or left are not
	A2.1.3.1.3	included in this
	Write and/or solve a	lesson. As an
	simple exponential or	example, you can
	logarithmic equation	draw a graph of a
	(including common and	parabola on the
	natural logarithms).	board with a
	, , , , , , , , , , , , , , , , , , ,	vertex at (-2, 0),
	A2.1.3.1.4	axis of symmetry
	Write, solve and/or apply	through $y = 0$, and
	linear or exponential	through (0, 2).
	growth or decay	Sample answer:
	(including problem	This lesson is
	situations).	about quadratic
		functions.
	A2.1.3.2.1	Parabolas opening
	Determine how a change	right or left do not
	in one variable relates to	represent
	a change in a second	functions since 2
	variable (e.g., y=4/x, if x	elements in the
	doubles, what happens	range are paired
	to y?).	with one element
		of the domain,
	A2.1.3.2.2	except at the
	Use algebraic processes	vertex.
	to solve a formula for a	 If students are
	given variable (e.g.,	having trouble
	solve $d = rt$ for r).	making
		connections
	A2.2.1.1.1	between the graph
	Analyze a set of data for	of a quadratic
	the existence of a	inequality and the
	pattern and represent	inequality itself,
	the pattern with a rule	then have
	algebraically and/or	students think
	graphically.	about how the
		graph of a
	A2.2.1.1.2	quadratic
	Identify and/or extend a	inequality helps
	pattern as either an	them understand
	arithmetic or geometric	the meaning of the
	sequence (e.g., given a	inequality. Ask
	geometric sequence, find	them to explore
	the 20th term).	whether the
l I		

Determine the domain, range or inverse of a relation. the graph of the inequality is more meaningful io the characteristics of an or oblymonial function of or holymonial function of or polymonial exponential or logarithmic function of the characteristics of an or polymonial function of a polymonial, exponential of intercepts, zeros, and asymptotes). the graph of the inequality is more meaningful io the characteristics of an or holymonial asymptotes). A22.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial quadratics). the arguation or table of a polynomial responsibility. A22.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function induces of a graph of a polynomial, exponential of logarithmic function. A22.2.1.3 Determine, use and/or pacified interval of a graph of a polynomial, exponential of logarithmic function. A22.2.1.1 Create, interpret and/or use the equation of a graph of a polynomial, exponential or logarithmic function. A22.2.1.1 Create, interpret and/or logarithmic function concerpret, use and/or begrafter interval of a graph of a polynomial, exponential or logarithmic function. A22.2.1.1 Lettify or describe the identify or describe the identify or describe the identify or describe the identify or describe the identer or other the identify or describe the i

	parameters within a family of functions (e.g.,
	$y = x^2$ and $y = x^2 + 3$, or
	$y = x^2$ and $y = 3x^2$).
	CC.2.1.HS.F.6
	Extend the knowledge of
	arithmetic operations and apply to complex
	numbers.
	CC.2.1.HS.F.7
	Apply concepts of
	complex numbers in polynomial identities and
	quadratic equations to
	solve problems.
	CC.2.2.HS.C.2
	Graph and analyze functions and use their
	properties to make
	connections between the
	different representations.
	CC.2.2.HS.C.4 Interpret the effects
	transformations have on
	functions and find the
	inverses of functions.
	CC.2.2.HS.D.1 Interpret the structure of
	expressions to represent
	a quantity in terms of its
	context.
	CC.2.2.HS.D.10 Represent, solve and
	interpret
	equations/inequalities
	and systems of
	equations/inequalities
	algebraically and graphically.
	graphically.
	CC.2.2.HS.D.7
	Create and graph
	equations or inequalities
	to describe numbers or
	relationships.

15 Polynomial s and Polynomial Functions	functions can be used to precisely and accurately model complicated real- world situations. The process of finding their solutions can be simplified using strategies and knowledge such as rewriting, change of signs of terms, factoring, synthetic division, remainder and factor theorems, rational zero theorem.	Polynomials Extend 5.1: Algebra Lab: Dimensional Analysis 5.2: Dividing Polynomials Extend 5.2: Graphing Technology Lab: Dividing Polynomials Explore Lesson 5.3: Graphing Technology Lab: Power Functions 5.3: Polynomial Functions 5.4: Analyzing Graphs of Polynomial Functions Extend Lesson 5.4: Graphing Technology Lab: Modeling Data using Polynomial Functions Explore Lesson 5.5: Graphing Technology Lab: Solving Polynomial Equations by Graphing 5.5: Solving Polynomial Functions Extend Lesson 5.5: Graphing Technology Lab: Solving Polynomial Equations by Graphing 5.5: Solving Polynomial Functions Extend Lesson 5.5: Graphing 5.5: Solving Polynomial Functions Extend Lesson 5.5: Graphing Technology Lab: Polynomial Identities 5.6: The Remainder	to model real-world situations? • What are the limits of mathematical modeling?	Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3 Simplify/reduce a rational algebraic expression. A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).	 and simplify monomials and expressions involving powers. Add, subtract, and multiply polynomials. Extend 5.1 & 5.2 Use dimensional analysis to convert units and solve problems. Divide polynomials using long division. Divide polynomials using synthetic division. 5.2 & Extend 5.2 Divide polynomials using long division. Divide polynomials using synthetic division. Use a graphing calculator with CAS to divide polynomials. Explore 5.3 Use a graphing calculator to explore power functions 5.3 Evaluate polynomial functions. Identify general shapes of graphs of polynomial functions. 5.4 Graph polynomial functions and locate their zeros. Find the relative maxima and minima of polynomial functions. Extend 5.4 Use a graphing calculator to model data whose curve of best 	 difficulty describing or using properties of exponents, then have them write their own summary of the properties of powers, such as "to multiply expressions with exponents, you add the exponents; to divide, you subtract the exponents." If some students have trouble keeping their concentration throughout the sequence of steps required in long division, then encourage them to compare intermediate results with a partner so they can ask questions and catch errors before completing the entire problem. Logical Learners Power functions are single-term polynomial functions that can have any degree. Have students examine the graphs of a variety of power functions and describe their similarities and differences. If students ask how math functions can 	(Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)
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	and Factor	A1.1.2.2.2	fit is a polynomial	describe real-
	Theorems	Interpret solutions to	function.	world situations,
		problems in the context	 Explore 5.5 & 5.5 	then have them
	5.7: Roots and	of the problem situation	Use a graphing	discuss the
	Zeros	(systems of 2 linear	calculator to find	appropriateness of
		equations only).	approximate	describing real-
	Extend Lesson 5.7:		solutions for	world situations
	Graphing	.1.3.1.1	polynomial	with mathematical
	Technology Lab:	Write or solve compound	equations.	functions. Help
	Analyzing	inequalities and/or graph	Factor polynomials.	them to
	Polynomial	their solution sets on a	Solve polynomial	understand that a
	Functions	number line (may include	equations by	function is usually
		absolute value	factoring.	just an
	5.8: Rational Zero	inequalities).	 5.5 & Extend 5.5 	approximation of
	Theorem		Factor polynomials.	the real-world
		A1.1.3.1.2	 Solve polynomial 	data, and is often
		Identify or graph the	 Solve polynomial equations by 	only a reasonable
		solution set to a linear		model of a limited
		inequality on a number	factoring.	domain of values.
		line.	Prove polynomial	If some students
			identities	need a visual to
		A1.1.3.1.3	• 5.6 Evaluate	help them solve
		Interpret solutions to	functions by using	problems like
		problems in the context	synthetic	Example 4 and
		of the problem situation	substitution.	Additional
		(limit to linear	 Determine whether 	Example 4, then it
		inequalities).	a binomial is a	may help them to
		mequanties).	factor of a	construct
		A1.1.3.2.1	polynomial by using	
		Write and/or solve a	synthetic	cardboard models
			substitution.	of the figures.
		system of linear	• 5.7 Determine the	If students can
		inequalities using	number and type of	describe two or
		graphing (limit systems	roots for a	three things about
		to 2 linear inequalities).	polynomial	this lesson that
			equation.	they found difficult
		A1.1.3.2.2	 Find the zeros of a 	to understand,
		Interpret solutions to	polynomial function.	then have them
		problems in the context	 Extend 5.7 & 5.8 	address each item
		of the problem situation	Use a graphing	by writing
		(systems of 2 linear	calculator to	explanations that
		inequalities only).		will help them
			analyze polynomial	review the material
		A1.2.1.1.1	functions.	later.
		Analyze a set of data for	 Identify possible 	 If students
		the existence of a pattern	rational zeros of a	sometimes make
		and represent the pattern	polynomial function.	mistakes in
		algebraically and/or	Find all of the	mathematics
		graphically.	rational zeros of a	exercises because
			polynomial function.	they cannot read
		A1.2.1.1.2	• 5.8 Identify possible	their own
		Determine if a relation is	rational zeros of a	handwriting, then
		a function given a set of	polynomial function.	
I			1	I]

	ſ			Lastate en al l			
				points or a graph.	Find all of the	stress that	
					rational zeros of a	throughout this	
				A1.2.1.1.3	polynomial function	course, students	
				Identify the domain or		must work using	
				range of a relation (may be presented as ordered		neat and careful	
						handwriting. It is	
				pairs, a graph, or a		extremely easy to	
				table).		misread	
				A1.2.1.2.1		coefficients and	
						exponents, or misread i as the	
				Create, interpret and/or use the equation, graph		number 1.	
				or table of a linear			
				function.		Logical Learners Organiza atudanta	
				Turiction.		Organize students	
				A1.2.1.2.2		into groups of four or five. Have the	
				Translate from one		students in each	
				representation of a linear			
				function to another		group split the work shown in	
				(graph, table and		Example 3 into	
				equation).		four or five steps.	
						The students	
				A1.2.2.1.1		should give	
				Identify, describe and/or		explanations to the	
				use constant rates of		group about their	
				change.		parts of the	
						Example. In	
				A1.2.2.1.2		particular,	
				Apply the concept of		students should	
				linear rate of change		explain any	
				(slope) to solve		mathematical	
				problems.		processes, the	
				P. 50 00101		results of their	
				A1.2.2.1.3		steps, and how the	
				Write or identify a linear		results relate to	
				equation when given the		the next step in	
				graph of the line 2 points		the process.	
				on the line, or the slope			
				and a point on a line,			
				(Linear equation may be			
				in point-slope, standard			
				and/or slope-intercept			
				form).			
				, ,			
				A1.2.2.1.4			
				Determine the slope			
				and/or y-intercept			
				represented by a linear			
				equation or graph.			
				3.«p			
				A2.1.2.2.1			
				Factor algebraic			
I		1	l.				

	expressions, including difference of squares and		
	trinomials (trinomials		
	limited to the form ax2+bx+c where a is not		
	equal to 0).		
	A2.1.2.2.2 Simplify rational		
	algebraic expressions.		
	101011		
	A2.1.3.1.1 Write and/or solve		
	quadratic equations		
	(including factoring and using the Quadratic		
	Formula).		
	A2.1.3.1.2		
	Solve equations involving		
	rational and/or radical		
	expressions (e.g., $10/(x + 3) + 12/(x - 2) = 1$ or $\sqrt{(x + 3)}$		
	$x^{2} + 21x) = 14$).		
	A2.1.3.1.3		
	Write and/or solve a		
	simple exponential or		
	logarithmic equation (including common and		
	natural logarithms).		
	A2.1.3.1.4		
	Write, solve and/or apply		
	linear or exponential		
	growth or decay (including problem		
	situations).		
	A2.1.3.2.1		
	Determine how a change		
	in one variable relates to		
	a change in a second variable (e.g., y=4/x, if x		
	doubles, what happens		
	to y?).		
	A2.1.3.2.2		
	Use algebraic processes to solve a formula for a		
	given variable (e.g.,		
	solve $d = rt$ for r).		

	A2.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically.	
	A2.2.1.1.2 Identify and/or extend a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term).	
	A2.2.1.1.3 Determine the domain, range or inverse of a relation.	
	A2.2.1.1.4 Identify and/or determine the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes).	
	A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics).	
	A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function (including common and natural logarithms).	
	A2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial,	

		exponential or logarithmic function.		
		A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation).		
		CC.2.1.HS.F.7 Apply concepts of complex numbers in polynomial identities and quadratic equations to solve problems.		
		CC.2.2.HS.C.2 Graph and analyze functions and use their properties to make connections between the different representations.		
		CC.2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.		
		CC.2.2.HS.D.3 Extend the knowledge of arithmetic operations and apply to polynomials.		
		CC.2.2.HS.D.4 Understand the relationship between zeros and factors of polynomials to make generalizations about functions and their graphs.		
		CC.2.2.HS.D.5 Use polynomial identities to solve problems.		

Week 15- 18 Inverses and radical Functions and Relations	 Graphing data can make it easier to choose a model to represent a data set. Inverse functions can be used to model a relationship so that either quantity is the independent variable. Radical functions have a unique shape and domain which can be used to model situations where the independent quantity is only positive, like time. 	 6.1: Operations on Functions 6.2: Inverse Functions and Relations Extend 6.2: Graphing Technology Lab: Inverse Functions and Inequalities 6.3: Square Root Functions and Inequalities 6.4: nth Roots Extend 6.4: Graphing Technology Lab: Graphing nth Root Functions 6.5: Operations with Radical Expressions 6.6: Rational Exponents 6.7: Solving Radical Equations and Inequalities Extend 6.7: Graphing technology Lab: Solving Radical Equations and Inequalities 	 How can you choose a model to represent a set of data? (Sample answer: You could create a scatter plot. Then, from the shape of the scatter plot, you could choose a function with a graph that fits the data.) Why would you use the inverse of a function to model a real-world situation? (Sample answer: You could use a function or the inverse of the function to model a relationship so that either quantity could be the independent variable. Then, you could use the functions to solve problems involving either quantity.) Why would you choose a square root function to model a set of data instead of a polynomial function? (Sample answer: The end behavior of a square root function 	CC.2.2.HS.D.6 Extend the knowledge of rational functions to rewrite in equivalent forms. CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships. A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3 Simplify/reduce a rational algebraic expression. A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation	 6.1 Find the sum, difference, product, and quotient of functions. Find the composition of functions. 6.2 Find the inverse of a function or relation. Determine whether two functions or relations are inverses. Extend 6.2 & 6.3 Compare a function and its inverse using a graphing calculator. Graph and analyze square root functions. Graph square root inequalities. 6.3 & 6.4 Graph and analyze square root functions. Graph square root inequalities. Simplify radicals. Use a calculator to approximate radicals. Use a calculator to approximate radicals. Use a graphing calculator to graph 	 Intrapersonal Learners Have students write expressions that involve compositions of functions and then annotate the expressions with notes to themselves such as, "[f ° g](x) is pronounced "f of g of x" and, "Start by finding the value g(x); then use that value as the input for f." Extension Many states use function compositions to calculate speeding ticket amounts. They do this by calculating the number of miles over the speed limit a driver is traveling, multiplying this number by a per mile charge, and adding a flat rate. Ask students to create a composition of three different functions, substituting made- up or researched 	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)
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might fit the data	(linear equations only).	<i>n</i> th root functions.	values for the
better than a		 6.5 Simplify radical 	posted speed limit,
polynomial function.	A1.1.2.2.1	expressions.	the per mile
Also, the domain of	Write and/or solve a	 Add, subtract, 	charge, and the
the square root	system of linear	multiply, and divide	flat rate. The
function is $x \ge 0$,	equations (including	radical expressions.	function
which may be	problem situations) using	 6.6 Write 	composition
applicable to many	graphing, substitution	expressions with	should be of the
real-world situations	and/or elimination (limit	rational exponents	form (f ° g °h) (x)
that involve	systems to 2 linear	in radical form and	where x is the
quantities such as	equations).	vice versa.	speed of the driver
time and distance.)		 Simplify 	in miles per hour.
	A1.1.2.2.2	expressions in	Kinesthetic
	Interpret solutions to	exponential or	Learners On a
	problems in the context	radical form.	large coordinate
	of the problem situation	 6.7 Solve equations 	grid, have
	(systems of 2 linear	containing radicals.	students model
	equations only).	 Solve inequalities 	the graph of the
		containing radicals.	identity function
	A1.1.3.1.1	 Extend 6.7 Use a 	f(x) = x using a
	Write or solve compound	graphing calculator	length of string, a
	inequalities and/or graph	to solve radical	piece of uncooked
	their solution sets on a	equations and	spaghetti, or
	number line (may include	inequalities.	something similar.
	absolute value	- 1	Then place a
	inequalities).		second length of
			string to model the
	A1.1.3.1.2		graph of $f(x) = 2x$
	Identify or graph the		– 5 from Example
	solution set to a linear		2. Have students
	inequality on a number		model the graph of
	line.		the inverse of this
			function and relate
	A1.1.3.1.3		the graphs of the
	Interpret solutions to		function, and its
	problems in the context		inverse, to the
	of the problem situation		graph of $f(x) = x$.
	(limit to linear		If students
	inequalities).		continue to
	444004		struggle with
	A1.1.3.2.1		graphing square
	Write and/or solve a		root inequalities,
	system of linear		yhen have
	inequalities using		students work in
	graphing (limit systems		pairs or small
	to 2 linear inequalities).		groups to discuss
	411222		how to graph
	A1.1.3.2.2		square root
	Interpret solutions to		inequalities such
	problems in the context		as those in
	of the problem situation		Exercises 31–38.
	(systems of 2 linear		

		inequalities only).		Students should	
				discuss how to	
		A1.2.1.1.1		determine the	
		Analyze a set of data for		domain and range	
		the existence of a		of an inequality,	
		pattern and represent		how to determine	
		the pattern algebraically		whether the	
		and/or graphically.		boundary is solid	
				or dashed, and	
		A1.2.1.1.2		how to determine	
		Determine if a relation is		where to shade	
		a function given a set of		the inequality.	
		points or a graph.		 Logical Learners 	
				Some students	
		A1.2.1.1.3		tend to think that x	
		Identify the domain or		must represent a	
		range of a relation (may		positive number	
		be presented as ordered		and –x must	
		pairs, a graph, or a		represent a	
		table).		negative number.	
				Reading -x as	
		A1.2.1.2.1		"the opposite of x"	
		Create, interpret and/or		should help them	
		use the equation, graph		understand that -x	
		or table of a linear		is 9 if x = −9. Also,	
		function.		explain that −9	
				has no square root	
		A1.2.1.2.2		that is a real	
		Translate from one		number. That is,	
		representation of a linear		no real number	
		function to another		can be squared to	
		(graph, table and		give −9. Remind	
		equation).		students that	
		. ,		$\sqrt{-9}$	
		A1.2.2.1.1		•	
		Identify, describe and/or		is 3i, an	
		use constant rates of		imaginary number.	
		change.		 If students 	
		_		continue to	
		A1.2.2.1.2		struggle with	
		Apply the concept of		graphing square	
		linear rate of change		root inequalities,	
		(slope) to solve		then have	
		problems.		students work in	
				pairs or small	
		A1.2.2.1.3		groups to discuss	
		Write or identify a linear		how to graph	
		equation when given the		square root	
		graph of the line 2 points		inequalities such	
		on the line, or the slope		as those in	
		and a point on a line,		Exercises 31–38.	
		(Linear equation may be		Students should	
·			•		

in point-slope, standard	discuss how to
and/or slope-intercept	determine the
form).	domain and range
	of an inequality,
A1.2.2.1.4	how to determine
Determine the slope	whether the
and/or y-intercept	boundary is solid
represented by a linear	or dashed, and
equation or graph.	how to determine
	where to shade
A2.1.2.2.1	the inequality.
Factor algebraic	If when presented
expressions, including	with a radical
difference of squares	expression such
and trinomials (trinomials	
limited to the form	11+6√3
ax2+bx+c where a is not	as ,
equal to 0).	some students
/.	persist in trying to
A2.1.2.2.2	add the 11 and the
Simplify rational	6, then to help
algebraic expressions.	them understand
	why this cannot be
A2.1.3.1.1	done, compare the
Write and/or solve	radical expression
quadratic equations	$11 + 6\sqrt{3}$
(including factoring and	-
using the Quadratic	to
Formula).	the expression 11
	+ 6x. Stress that
A2.1.3.1.2	6√3
Solve equations	the radical
involving rational and/or	is a multiplication
radical expressions (e.g.,	expression just
10/(x + 3) + 12/(x - 2) =	like 6x. Remind
10(x+3)+12/(x-2) = 1 1 or $\sqrt{(x^2+2)^2} = 14$).	students that the
	order of operations
A2.1.3.1.3	requires that
Write and/or solve a	multiplication be
simple exponential or	performed before
logarithmic equation	addition. Students
(including common and	may find it helpful
natural logarithms).	to rewrite
A2.1.3.1.4	11+6√3
Write, solve and/or apply	<u>_,</u> as
linear or exponential	$11 + 6 \sqrt{3}$
growth or decay	11.0 43
(including problem	•
situations).	 Interpersonal
Silualions).	Learners Ask
A21221	students to work in
A2.1.3.2.1	

		Determine how a change	groups as they	
		in one variable relates to	compare solving	
		a change in a second	radical equations	
		variable (e.g., $y=4/x$, if x	and inequalities to	
		doubles, what happens	solving other types	
			of equations and	
		to y?).		
		40.4.0.0.0	inequalities. Have	
		A2.1.3.2.2	them write or give	
		Use algebraic processes	a short	
		to solve a formula for a	presentation about	
		given variable (e.g.,	the similarities and	
		solve $d = rt$ for r).	differences	
			between the	
		A2.2.1.1.1	procedures used	
		Analyze a set of data for	in the solution	
		the existence of a	process.	
		pattern and represent	P. 00000.	
		the pattern with a rule		
		algebraically and/or		
		araphically anu/or		
		graphically.		
		A22112		
		A2.2.1.1.2		
		Identify and/or extend a		
		pattern as either an		
		arithmetic or geometric		
		sequence (e.g., given a		
		geometric sequence, find		
		the 20th term).		
		,		
		A2.2.1.1.3		
		Determine the domain,		
		range or inverse of a		
		relation.		
		A2.2.1.1.4		
		Identify and/or determine		
		the characteristics of an		
		exponential, quadratic,		
		or polynomial function		
		(e.g., intervals of		
		increasing/decreasing,		
		intercepts, zeros, and		
		asymptotes).		
		A2.2.2.1.1		
		Create, interpret and/or		
		use the equation, graph		
		or table of a polynomial		
		function (including		
		quadratics).		
		quaurance).		
		40.0.0.1.0		
I		A2.2.2.1.2		

					I
			Create, interpret and/or use the equation, graph		
			or table of an		
			exponential or		
			logarithmic function		
			(including common and		
			natural logarithms).		
			A2.2.2.1.3		
			Determine, use and/or		
			interpret minimum and		
			maximum values over a		
			specified interval of a		
			graph of a polynomial, exponential or		
			logarithmic function.		
			A2.2.2.1.4		
			Translate a polynomial,		
			exponential or		
			logarithmic function from one representation to		
			another (graph, table		
			and equation).		
			A2.2.2.2.1 Identify or describe the		
			effect of changing		
			parameters within a		
			family of functions (e.g.,		
			$y = x^2$ and $y = x^2 + 3$, or		
			$y = x^{2}$ and $y = 3x^{2}$).		
			CC.2.2.HS.C.2		
			Graph and analyze		
			functions and use their		
			properties to make		
			connections between the		
			different representations.		
			CC.2.2.HS.C.3		
			Write functions or		
			sequences that model		
			relationships between		
			two quantities.		
			CC.2.2.HS.C.4		
			Interpret the effects		
			transformations have on		
			functions and find the		
			inverses of functions.		
		1			

Week 19- 21 Exponential and Logarithmic Functions and Relations	 Exponential and Logarithmic functions are inverses. You can use them to model change over time where there are iterations (such as in compound interst with finances, or generations as with populations.) Being financially literate can help you make wise 	7.1: Graphing Exponential Functions 7.2: Exploring Graphing Technology 7.2: Solving Exponential Equations and Inequalities 7.3: Logarithms and Logarithmic Functions 7.4 Solving Logarithmic Equations and Inequalities	 How can you make good decisions? (Sample answer: Determine the available options, compare the advantages and disadvantages of each option, analyze the consequences, and choose the best option.) What factors can affect good decision making? (Sample answers: the 	CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically. CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable. A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring	 7.1 Graph exponential growth functions. Graph exponential decay functions. Explore 7.2 & 7.2 Use a graphing calculator to solve exponential equations by graphing or by using the table feature. Solve exponential equations. Solve exponential isource interval 	ELL: Visual Because there are so many new properties taught in this chapter, suggest that students make up property posters. Encourage students to be as abbreviated as possible and to use color to help them see at a glance how the property works.	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)
	 interst with finances, or generations as with populations.) Being financially 	 7.3: Logarithms and Logarithmic Functions 7.4 Solving Logarithmic 	consequences, and choose the best option.)What factors can affect good decision	Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form	graphing or by using the table feature.Solve exponential equations.	abbreviated as possible and to use color to help them see at a glance how the	Chapter Quiz/Test) Tests (Form 1,

 		.	I
understand the	algebraic property to	 Graph logarithmic 	money they have
vocabulary of	justify any step in an	functions.	on a bar graph.
financial terms and	equation solving process	 Use a graphing 	Option 2
know how to	(linear equations only).	calculator to find an	Approaching Level
analyze data and		equation of best fit	As a class, make a
trends. Successfully	A1.1.2.1.3	for exponential and	Venn diagram for
applying these skills	Interpret solutions to	logarithmic	the set of real
when considering	problems in the context	functions.	numbers. Once
your available	of the problem situation	 7.4 Solve 	the diagram is
options can help	(linear equations only).	logarithmic	made, review with
you to make good		equations.	students what it
decisions in many	A1.1.2.2.1	 Solve logarithmic 	means for a
real-world situations	Write and/or solve a	inequalities.	number to be a
such as opening a	system of linear	 7.5 Simplify and 	rational number,
bank account,	equations (including	evaluate	integer, whole
applying for college	problem situations) using	expressions using	number, natural
loans, and buying a	graphing, substitution	the properties of	number, or
house.)	and/or elimination (limit	logarithms.	irrational number.
 How do you use the 	systems to 2 linear	 Solve logarithmic 	Write an example
concept of	equations).	equations using the	of each type of
exponential growth		properties of	real number on the
to work with the	A1.1.2.2.2	logarithms.	diagram. Then
principle of	Interpret solutions to	 7.6 Solve 	discuss e as an
compound interest?	problems in the context	exponential	irrational number.
 How do you convert 	of the problem situation	equations and	 Option 3 English
between	(systems of 2 linear	inequalities using	Learners Write
exponential and	equations only).	common	several
logarithmic form?		logarithms.	exponential
 How do you use the 	A1.1.3.1.1	 Evaluate 	functions and their
inverse relationship	Write or solve compound	logarithmic	related logarithmic
between	inequalities and/or graph	expressions using	functions on the
exponential and	their solution sets on a	the Change of Base	board. Ask
logarithmic	number line (may include	Formula.	students to read
functions to solve	absolute value	 7.6 & Extend 7.6 	aloud each
equations?	inequalities).	Solve exponential	expression. For
		equations and	example, have
	A1.1.3.1.2	inequalities using	students say two
	Identify or graph the	common	to the third power
	solution set to a linear	logarithms.	is equal to eight
	inequality on a number	 Evaluate 	for 23 = 8. Then
	line.		have students say
		logarithmic	the logarithm of
	A1.1.3.1.3	expressions using	eight with base
	Interpret solutions to	the Change of Base	two is equal to
	problems in the context	Formula.	three for log2 8 =
	of the problem situation	Use a graphing	3.
	(limit to linear	calculator to solve	Option 4 Beyond
	inequalities).	exponential and	Level Ask
		logarithmic	students to do a
	A1.1.3.2.1	equations and	search for the
	Write and/or solve a	inequalities.	
	system of linear	 7.7 Evaluate 	tables of common

1		
inequalities using	expressions	logarithms of
graphing (limit systems	involving the natural	numbers either in
to 2 linear inequalities).	base and natural	the appendices of
	logarithm.	older algebra texts
A1.1.3.2.2	 Solve exponential 	or online. As a
Interpret solutions to	equations and	class, learn to
problems in the context	inequalities using	read and use
of the problem situation	natural logarithms.	these tables. Then
(systems of 2 linear	• Explore 7.8 & 7.8	ask students to
inequalities only).	Use a spreadsheet	use the tables to
	to display the	evaluate several
A1.2.1.1.1	growth of an	common
Analyze a set of data for	investment over	logarithms, such
the existence of a	time.	as log10125. Then
pattern and represent	 Use logarithms to 	have students
the pattern algebraically	solve problems	compare their
and/or graphically.	involving	results with what
	exponential growth	they get when they
A1.2.1.1.2	and decay.	evaluate the same
Determine if a relation is	 Use logarithms to 	logarithms using
a function given a set of	solve problems	their calculator.
points or a graph.	involving logistic	Verbal/Linguistic
	growth.	Learners Ask
A1.2.1.1.3	 7.8 & Extend 7.8 	students where
Identify the domain or	Use logarithms to	they have heard
range of a relation (may	solve problems	the term
be presented as ordered	involving	exponential before
pairs, a graph, or a	exponential growth	and what they
table).	and decay.	think it might
,	 Use logarithms to 	mean. Students
A1.2.1.2.1	solve problems	may have heard
Create, interpret and/or	involving logistic	terms like
use the equation, graph		exponential growth
or table of a linear	growth.	on a television
function.	Use a data	news program and
	collection device to	they might think
A1.2.1.2.2	investigate the	that exponential
Translate from one	differences between	means
representation of a linear	types of insulated	"enormous." Use
function to another	cups and cooling	students' answers
(graph, table and	time.	to introduce the
equation).		concept of
,		exponential
A1.2.2.1.1		functions.
Identify, describe and/or		Extension Have
use constant rates of		students extend
change.		the solution to
		Example 3 for an
A1.2.2.1.2		increasing number
Apply the concept of		of compounding
linear rate of change		periods. Try daily
(slope) to solve		

problems.		nding (<i>n</i> =
	365), ar	
A1.2.2.1.3	explore	
Write or iden		
equation whe		p to tens
graph of the		
on the line, o		
and a point o		l amount
(Linear equa	tion may be approad	hes an
in point-slope	e, standard upper li	nit, which
and/or slope-	-intercept in this c	ase is
form).	about \$	4694.03.
	 If stude 	nts need
A1.2.2.1.4	help vis	ualizing
Determine th		
and/or y-inter		
represented		equivalent
equation or g		
	expone	
A2.1.2.2.1	equatio	
Factor algebra		
expressions,		
difference of		showing
and trinomial		equivalent
limited to the		ntial and
ax2+bx+c wh		
equal to 0).	- 3	ns, such as
- 1	23 = 8 a	
A2.1.2.2.2		Suggest
Simplify ratio	nal that stu	dents use
algebraic exp		ent color for
		the digits
A2.1.3.1.1	2, 3, an	
Write and/or		
quadratic equ		
(including fac		
using the Qu		3 27. 2, 3
Formula).		sk them to
		he value
A2.1.3.1.2	of log3	
Solve equation	ons After the	
involving ratio		5
radical expre		ons, ask
10/(x + 3) + 1		check to
1 or $\sqrt{(x^2 + 3)^2}$		raised to
	their pre-	
A2.1.3.1.3		s equal to
Write and/or	solve a 9 · 27, c	
simple expor	, -	em predict
logarithmic e		
(including co	-	
natural logari). log3 m +
natural logan	iu ii ioj.	

	log3 n
A2.1.3.1.4	 Interpersonal
Write, solve and/or apply	Learners
linear or exponential	Immediately after
growth or decay	discussing
(including problem	Example 4, have
situations).	pairs of students
	rework the
A2.1.3.2.1	Example together
Determine how a change	without looking at
in one variable relates to	the solution in the
a change in a second	text. Have the
variable (e.g., y=4/x, if x	partners take turns
doubles, what happens	explaining the
to y?).	solution steps to
	each other. Have
A2.1.3.2.2	them also discuss
Use algebraic processes	the
to solve a formula for a	reasonableness of
given variable (e.g.,	their solutions.
solve $d = rt$ for r).	Extension Show
	students the
A2.2.1.1.1	
Analyze a set of data for	following: log10
the existence of a	3 ≈ 0.4771
pattern and represent	log10 30 ≈ 1.4771
the pattern with a rule	log10 300 ≈
algebraically and/or	2.4771
graphically.	log10 3000 ≈
graphically.	3.4771
A2.2.1.1.2	Ask students to
	predict log10
Identify and/or extend a	30,000. 4.4771
pattern as either an	Have students use
arithmetic or geometric	properties of
sequence (e.g., given a	logarithms to
geometric sequence, find	explain this
the 20th term).	pattern. Sample
	explanation: 3, 30,
A2.2.1.1.3	300, and 3000 can
Determine the domain,	be written as 3 ×
range or inverse of a	100, 3 × 101, 3 ×
relation.	102, and 3 × 103
	respectively. Then
A2.2.1.1.4	the base 10
Identify and/or determine	logarithms of each
the characteristics of an	can be rewritten
exponential, quadratic,	as a sum of two
or polynomial function	logarithms. For
(e.g., intervals of	example, log10
increasing/decreasing,	3000 can be
intercepts, zeros, and	written as log10 (3

ГГ		
		• 103). Then it
	A2.2.2.1.1	follows that log10
	Create, interpret and/or	$(3 \cdot 103) = \log 10 3$
	use the equation, graph	+ log10 103 =
	or table of a polynomial	log10 (3) + 3 =
	function (including	3.4771.
	quadratics).	Logical Learners
		Ask students to
	A2.2.2.1.2	recall that an
	Create, interpret and/or	equation like 4x =
	use the equation, graph	19 from Example 3
	or table of an	could be written in
	exponential or	logarithmic form
	logarithmic function	as log4 19 = x.
	(including common and	Although this
	natural logarithms).	logarithm cannot
		be directly
	A2.2.2.1.3	evaluated, the
	Determine, use and/or	Change of Base
	interpret minimum and	Formula can be
	maximum values over a	used to give the
	specified interval of a	correct result of x
	graph of a polynomial,	≈ 2.1234.
	exponential or	If some students
	logarithmic function.	mistakenly think
		that an equation
	A2.2.2.1.4	like $4e-2x - 5 = 3$
	Translate a polynomial,	contains two
	exponential or	variables, then
	logarithmic function from	point out that the
	one representation to	letter e represents
	another (graph, table	a constant, just as
	and equation).	π does. Both e
		and π are
	A2.2.2.2.1	irrational numbers,
	Identify or describe the	which cannot be
	effect of changing	expressed exactly
	parameters within a	with numerals. To
	family of functions (e.g.,	help students
	$y = x^2$ and $y = x^2 + 3$, or	avoid this
	$y = x^{2}$ and $y = 3x^{2}$).	confusion, have
		them highlight the
	CC.2.2.HS.C.2	variables in the
	Graph and analyze	equation with a
	functions and use their	marker.
	properties to make	Logical Learners
	connections between the	Have students
	different representations.	work in pairs or
	00 0 0 1 1 0 0 0	small groups. Ask
	CC.2.2.HS.C.3	them to examine
	Write functions or	the growth and
	sequences that model	

				relationships between two quantities. CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.C.5 Construct and compare linear, quadratic and exponential models to solve problems. CC.2.2.HS.D.1 Interpret the structure of expressions to represent a quantity in terms of its context. CC.2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically. CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.		 decay formulas used in Examples 1– 3 and to discuss how the equations are related. In particular, ask them to discuss how they can identify which equations are used for exponential decay situations (minus/negative sign) and which are used for exponential growth. Extension Mathematically and scientifically talented students can research the growth rates of different bacteria types. Students can explore how these growth rates are determined, environmental factors that cause them to thrive or inhibit their prosperity, and 	
				equations or inequalities to describe numbers or relationships.		them to thrive or inhibit their	
Weeks 22- 23 Rational Functions and Relations	 Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization. Mathematical relationships can be represented as expressions, 	 8.1: Multiplying and Dividing Rational Expressions 8.2: Adding and Subtracting Rational Expressions 8.3: Graphing Reciprocal Functions 8.4: Graphing rational Functions 8.4: Extend: 	• Why are graphs useful? (Sample answer: Graphs are useful because they can help you visualize relationships between real-world quantities. They can also be used to estimate function values.)	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including	 8.1: Simplify rational expressions Simplify complex fractions 8.2:Determine the LCCM of Polynomials Add and subtract rational expressions 8.3: Determine properties of reciprocal functions 	 Interpersonal Place students in groups of four. Since there are several tasks involved in graphing reciprocal functions of the form 	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter

equations, and	Graphing Rational	How are the	difference of squares	Graph	f(v) a	Quiz/Test)
equations, and inequalities in mathematical situations.	Graphing Rational Functions 8.5: Variation Functions 8.6: Solving Rational Equations and Inequities 8.6 Extend: Graphing Rational Equation and Inequalities	 properties of a rational function reflected in its graph? (Sample answer: Vertical asymptotes occur at values that make the denominator 0; horizontal asymptotes occur when the degree of the numerator is less than or equal to the degree of the denominator; oblique asymptotes occur when the degrees of the numerator and denominator differ by 1; holes occur when the numerator and denominator share a binomial factor.) How can analyzing a rational function algebraically and graphically help you to see the "whole picture?" (Sample answer: An algebraic analysis can help you to determine points of discontinuity that may not be clear or noticeable when 	difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3 Simplify/reduce a rational algebraic expression. A1.1.2.1.1 Write, solve and/or apply a linear equation (including problem situations). A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only). A1.1.2.2.1 Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).	 Graph transformations of reciprocal functions 8.4 Graph rational functions with vertical and horizontal asymptotes Graph rational functions with oblique asymptotes and point discontinuity Extend 8.4: Use a graphing calculator to explore the graphs of rational functions 8.5: Recognize and solve direct and joint variation problems Recognize and solve inverse and combined variation problems 8.6: Solve rational equations Solve rational inequalities Extend 8.6: Use a graphing calculator to solve rational equations by graphing or by using the table feature 	$f(x) = \frac{a}{x-h} + k$, have the group members decide which tasks they should each complete in order to graph a given function. For example, one member can be responsible for finding the a, h, and k values, another can identify the asymptotes, another can substitute values in order to determine points on the graph, and a fourth member can graph the points and draw the curve of the function. • Logical As you explain the various types of variation functions, have students copy and complete the following table to help them organize all the types studied. • If students are	Quiz/Test) Tests (Form 1, 2A, 2B, 2C)
		 when the numerator and denominator share a binomial factor.) How can analyzing a rational function algebraically and graphically help you to see the "whole 	equation solving process (linear equations only). A1.1.2.1.3 Interpret solutions to problems in the context of the problem situation (linear equations only).	 Recognize and solve inverse and combined variation problems 8.6: Solve rational equations Solve rational inequalities 	 on the graph, and a fourth member can graph the points and draw the curve of the function. Logical As you explain the various 	
		answer: An algebraic analysis can help you to determine points of discontinuity that may not be clear or noticeable when viewing the graph of the function. A	Write and/or solve a system of linear equations (including problem situations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).	to solve rational equations by graphing or by using the table	functions, have students copy and complete the following table to help them organize all the types studied.	
		 graphical analysis can help you to see the asymptotes and end behavior of the function.) Why is it important to state the restricted values before simplifying a rational 	A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations only). A1.1.3.1.1 Write or solve compound inequalities and/or graph their solution sets on a		problems, then encourage them to use several steps, writing each one below the previous and keeping each line equivalent to the one above. Caution them to make only one	

	number line (may include	change per step.
	absolute value	Extension To
	inequalities).	prepare students
expression can be		for the next lesson
	A1.1.3.1.2	and to build a
	Identify or graph the	strong base for
	solution set to a linear	future work with
roots relate with	inequality on a number	rational
rational exponents?	line.	expressions, give
 Why is it necessary 		them an
to check the	A1.1.3.1.3	expression like
possible solutions	Interpret solutions to	$5x^{2}(x^{2}+3)$
for extraneous roots	problems in the context	
when solving a	of the problem situation	5x(x+3)
radical equation	(limit to linear	
	inequalities).	Ask them to
		explain in detail,
	A1.1.3.2.1	citing
	Write and/or solve a	fundamentals from
	system of linear	arithmetic, why the
	inequalities using	fives can be
	graphing (limit systems	divided out but not
	to 2 linear inequalities).	the threes. Also
	A1.1.3.2.2	explain why the first x2 and x can
	Interpret solutions to	
	problems in the context	be divided by x to
	of the problem situation	simplify, but not
	(systems of 2 linear	those within
	inequalities only).	parentheses.
		Students'
	A1.2.1.1.1	explanations
	Analyze a set of data for	should mention
	the existence of a	that common
	pattern and represent	factors of both the
	the pattern algebraically	numerator and
	and/or graphically.	denominator can
		be divided out, but
	A1.2.1.1.2	not terms that are
	Determine if a relation is	parts of
	a function given a set of	polynomials.
	points or a graph.	Substitution of a
		number, like 2, for
	A1.2.1.1.3	x may help some
	Identify the domain or	students reach this
	range of a relation (may	realization.
	be presented as ordered	If students have
	pairs, a graph, or a	difficulty adding
	table).	and subtracting
		rational
	A1.2.1.2.1	expressions, then
	Create, interpret and/or	have students
	סופמנה, ווונדוטובו מווע/טו	

		use the equation, graph	work with a
		or table of a linear	partner, one in the
		function.	role of a coach,
			the other in the
		A1.2.1.2.2	role of an athlete.
		Translate from one	The athlete works
		representation of a linear	a problem, using
		function to another	steps and
		(graph, table and	explaining the
		equation).	thinking while the
			coach listens and
		A1.2.2.1.1	watches for errors,
		Identify, describe and/or	correcting as
		use constant rates of	necessary. Then
		change.	the partners
		-	exchange roles.
		A1.2.2.1.2	Visual/Spatial
		Apply the concept of	Learners Have
		linear rate of change	students graph
		(slope) to solve	one of the
		problems.	functions from the
			lesson on a large
		A1.2.2.1.3	sheet of poster
		Write or identify a linear	board to clearly
		equation when given the	show how the
		graph of the line 2 points	graph approaches
		on the line, or the slope	but never reaches
		and a point on a line,	an asymptote.
		(Linear equation may be	Encourage
		in point-slope, standard	students to use a
		and/or slope-intercept	variety of colored
		form).	markers.
			 Extension
		A1.2.2.1.4	Challenge
		Determine the slope	students to explain
		and/or y-intercept	the rules for
		represented by a linear	finding horizontal
		equation or graph.	and oblique
			asymptotes. While
		A2.1.3.1.1	the chapter shows
		Write and/or solve	students how to
		quadratic equations	find them, the
		(including factoring and	explanation of why
		using the Quadratic	the rules work can
		Formula).	be left to high
			ability students.
		A2.1.3.1.2	Scaffold the task
		Solve equations	by having students
		involving rational and/or	examine graphs of
		radical expressions (e.g.,	varying degrees in
		10/(x + 3) + 12/(x - 2) =	the numerator and
		1 or $\sqrt{(x^2 + 21x)} = 14$).	
	I		

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	denominator and
A2.1.3.1.3	look for general
Write and/or solve a	patterns in the
simple exponential or	asymptotes.
logarithmic equation	Verbal/Linguistic
(including common and	Learners Have
natural logarithms).	students write a
	list of tips to help
A2.1.3.1.4	someone draw the
Write, solve and/or apply	graphs of rational
linear or exponential	functions.
growth or decay	 Logical Learners
(including problem	Have students
situations).	think about the
	difference
A2.1.3.2.1	between "pure"
Determine how a change	mathematics, such
in one variable relates to	as solving an
a change in a second	equation, and
variable (e.g., y=4/x, if x	"applied"
doubles, what happens	mathematics, such
to y?).	as solving a real-
	world problem.
A2.1.3.2.2	Ask them to list
Use algebraic processes	
to solve a formula for a	some ways in
	which these two
given variable (e.g.,	are alike and
solve d = rt for r).	some ways in
	which they are
A2.2.1.1.1	different.
Analyze a set of data for	•
the existence of a	
pattern and represent	
the pattern with a rule	
algebraically and/or	
graphically.	
A2.2.1.1.2	
Identify and/or extend a	
pattern as either an	
arithmetic or geometric	
sequence (e.g., given a	
geometric sequence, find	
the 20th term).	
A2.2.1.1.3	
Determine the domain,	
range or inverse of a	
relation.	
A2.2.1.1.4 Identify and/or determine	

 ·		
	the characteristics of an exponential, quadratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes).	
	A2.2.2.1.1 Create, interpret and/or use the equation, graph or table of a polynomial function (including quadratics).	
	A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an exponential or logarithmic function (including common and natural logarithms).	
	A2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function.	
	A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation).	
	A2.2.2.2.1 Identify or describe the effect of changing parameters within a family of functions (e.g., $y = x^2$ and $y = x^2 + 3$, or $y = x^2$ and $y = 3x^2$).	
	CC.2.2.HS.C.2 Graph and analyze functions and use their	

				properties to make		
				connections between the		
				different representations.		
				CC.2.2.HS.C.4		
				Interpret the effects transformations have on		
				functions and find the		
				inverses of functions.		
				CC.2.2.HS.D.10		
				Represent, solve and		
				interpret		
				equations/inequalities		
				and systems of		
				equations/inequalities		
				algebraically and		
				graphically.		
				CC.2.2.HS.D.6		
				Extend the knowledge of		
				rational functions to		
				rewrite in equivalent		
				forms.		
				CC.2.2.HS.D.7		
				Create and graph		
				equations or inequalities		
				to describe numbers or		
				relationships.		
				CC.2.2.HS.D.8		
				Apply inverse operations		
				to solve equations or		
				formulas for a given		
				variable.		
Week 25-	•	9.1: Midpoint and	How does	A1.1.1.5.1	•	Homework
27 Conic		Distance Formulas	mathematics help	Add, subtract and/or		(Teacher
Sections		9.2: Parabolas	us to describe the	multiply polynomial		Editions,
		9.3 Explore:	physical world?	expressions (express		Suggested HW
		Graphing Equations of Circles	(Sample answer: Mathematics	answers in simplest form – nothing larger than a		at beginning of each problem
		9.3: Circles	enables us to	binomial multiplied by a		set)
		9.4 Explore: Ellipses	model real-world	trinomial).		360
		9.4: Ellipses	situations, which			Participation
		9.5: Hyperbolas	allows us to	A1.1.1.5.2		
		9.6: Identifying	analyze and	Factor algebraic		Quiz (Mid
		Conic Sections	understand these	expressions, including		Chapter
		9.6 Extend:	situations better,	difference of squares		Quiz/Test)
		Graphing and	and thus make	and trinomials (trinomials		
		Analyzing Quadratic	better decisions.)	limited to the form		Tests (Form 1,
		Relations		ax2+bx+c where a is		2A, 2B, 2C)

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	9.7 Explore:	 What are the 	equal to 1 after factoring		
	Grapping Linear and	similarities and	out all monomial factors).		
	Nonlinear Systems	differences			
	9.7: Solving Linear-	between parabolas	A1.1.1.5.3		
	Nonlinear Systems	and ellipses?	Simplify/reduce a		
	· · · · · · · · · · · · · · · · · · ·	(Sample answer:	rational algebraic		
		Similarities: Curved	expression.		
		graphs; equations	A1.1.2.1.1		
		contain a variable			
		raised to second	Write, solve and/or apply		
		power. Differences:	a linear equation		
		Parabolas have one	(including problem		
		focus and one	situations).		
		vertex; ellipses			
		have two foci, 2	A1.1.2.1.2		
		vertices, and 2 co-	Use and/or identify an		
		vertices.)	algebraic property to		
		 What are the 	justify any step in an		
		similarities and	equation solving process		
		differences	(linear equations only).		
		between	· · · · · · · · · · · · · · · · · · ·		
		hyperbolas and the	A1.1.2.1.3		
		other conic	Interpret solutions to		
		sections? (Sample	problems in the context		
		answer: Similarities:	of the problem situation		
		Curved graphs;	(linear equations only).		
		equations contain			
		one or two	A1.1.2.2.1		
		variables raised to	Write and/or solve a		
		second power.	system of linear		
		Differences:	equations (including		
		Hyperbolas have	problem situations) using		
		two branches; other	graphing, substitution		
		conic sections are	and/or elimination (limit		
		continuous.)	systems to 2 linear		
		 Why are parabolas, 	equations).		
		• why are parabolas, circles, ellipses,			
			A1.1.2.2.2		
		and hyperbolas	Interpret solutions to		
		called conic	problems in the context		
		sections? (Sample			
		answer: They are	of the problem situation		
		the cross sections	(systems of 2 linear		
		formed by a plane	equations only).		
		and a double			
		napped cone.)	A1.1.3.1.1		
			Write or solve compound		
			inequalities and/or graph		
			their solution sets on a		
			number line (may include		
			absolute value		
			inequalities).		

	A1.1.3.1.2 Identify or graph the solution set to a linear inequality on a number line.	
	A1.1.3.1.3 Interpret solutions to problems in the context of the problem situation (limit to linear inequalities).	
	A1.1.3.2.1 Write and/or solve a system of linear inequalities using graphing (limit systems to 2 linear inequalities).	
	A1.1.3.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear inequalities only).	
	A1.2.1.1.1 Analyze a set of data for the existence of a pattern and represent the pattern algebraically and/or graphically.	
	A1.2.1.1.2 Determine if a relation is a function given a set of points or a graph.	
	A1.2.1.1.3 Identify the domain or range of a relation (may be presented as ordered pairs, a graph, or a table).	
	A1.2.1.2.1 Create, interpret and/or use the equation, graph or table of a linear function.	

	A1.2.1.2.2 Translate from one representation of a linear function to another (graph, table and equation).
	A1.2.2.1.1 Identify, describe and/or use constant rates of change.
	A1.2.2.1.2 Apply the concept of linear rate of change (slope) to solve problems.
	A1.2.2.1.3 Write or identify a linear equation when given the graph of the line 2 points on the line, or the slope and a point on a line, (Linear equation may be in point-slope, standard and/or slope-intercept form).
	A1.2.2.1.4 Determine the slope and/or y-intercept represented by a linear equation or graph.
	A2.1.3.1.1 Write and/or solve quadratic equations (including factoring and using the Quadratic Formula).
	A2.1.3.1.2 Solve equations involving rational and/or radical expressions (e.g., 10/(x + 3) + 12/(x - 2) = 1 or $\sqrt{(x + 21x)} = 14$).
	A2.1.3.1.3 Write and/or solve a simple exponential or

		logarithmic equation (including common and		
		natural logarithms).		
		A2.1.3.1.4 Write, solve and/or apply		
		linear or exponential		
		growth or decay (including problem		
		situations).		
		A2.1.3.2.1		
		Determine how a change in one variable relates to		
		a change in a second variable (e.g., y=4/x, if x		
		doubles, what happens		
		to y?).		
		A2.1.3.2.2 Use algebraic processes		
		to solve a formula for a		
		given variable (e.g., solve d = rt for r).		
		A2.2.1.1.1		
		Analyze a set of data for		
		the existence of a pattern and represent		
		the pattern with a rule		
		algebraically and/or graphically.		
		A2.2.1.1.2		
		Identify and/or extend a		
		pattern as either an arithmetic or geometric		
		sequence (e.g., given a geometric sequence, find		
		the 20th term).		
		A2.2.1.1.3		
		Determine the domain, range or inverse of a		
		relation.		
		A2.2.1.1.4		
		Identify and/or determine the characteristics of an		
		exponential, quadratic,		
		or polynomial function (e.g., intervals of		
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		increasing/decreasing,		
		intercepts, zeros, and		
		asymptotes).		
		A2.2.2.1.1		
		Create, interpret and/or		
		use the equation, graph		
		or table of a polynomial		
		function (including		
		quadratics).		
		40.004.0		
		A2.2.2.1.2		
		Create, interpret and/or		
		use the equation, graph		
		or table of an		
		exponential or		
		logarithmic function		
		(including common and		
		natural logarithms).		
		,		
		A2.2.2.1.3		
		Determine, use and/or		
		interpret minimum and		
		maximum values over a		
		specified interval of a		
		graph of a polynomial,		
		exponential or		
		logarithmic function.		
		A2.2.2.1.4		
		Translate a polynomial,		
		exponential or		
		logarithmic function from		
		one representation to		
		another (graph, table		
		and equation).		
		A2.2.2.2.1		
		Identify or describe the		
		offect of changing		
		effect of changing		
		parameters within a		
		family of functions (e.g.,		
		$y = x^2$ and $y = x^2 + 3$, or		
		$y = x^{2}$ and $y = 3x^{2}$).		
		CC.2.2.HS.C.2		
		Graph and analyze		
		functions and use their		
		properties to make		
		connections between the		
		different representations.		
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				CC.2.2.HS.C.4 Interpret the effects transformations have on functions and find the inverses of functions. CC.2.2.HS.D.10 Represent, solve and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically. CC.2.2.HS.D.6 Extend the knowledge of			
Week 28- 30 Sequences and Series	• Arithmetic and Geometric Sequences and Series can be used to model patterns of change, such as with numbers, Recursive and Iterative Functions, and Binomial Expansion.	10.1: Sequences as Functions 10.2: Arithmetic Sequences and Series 10.3: Geometric Sequences and Series 10.4 Explore: Area Under a Curve 10.4: Infinite Geometric Series 10.4 Extend: Graphing Limits 10.5: Recursion and Iteration 10.5 Extend: Amortizing Loans 10.6: Binomial Theorem	 Where are patterns found in the real world? (Sample answer: in nature, architecture, music, science, art.) How can recognizing patterns help you solve real-world problems? (Sample answer: Recognizing a pattern can help you to predict future behavior.) What types of patterns can be modeled 	CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable. A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors). A1.1.1.5.3	 10.1: Relate arithmetic sequences to linear functions Relate geometric sequences to exponential functions 10.2: Use arithmetic sequences Find sums of arithmetic series 10.3: Use geometric sequences Find sums of geometric series Explore 10.4: Approximate the area under a curve 	 Logical Have students make a chart that compares and contrasts arithmetic and geometric sequences and series, explaining what the variables represent in each formula. Interpersonal Create a friendly competition between two groups of students, the Binomial Theorem 	Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)

Combinations and Pascals Triangle(Sample answer: numerical patterns involving real number operations and multiplication. a difficult represent a numeric pattern with a formular (Sample and number operations atoms wer: By using a torauta to represent a numeric pattern with a torau as be formular to an use of the pattern. You can use the formular to an use of the pattern is indications to presenting the sequence representing the pattern with a to an also determine of the pattern is linear or atoms of the pattern is to an use the formula to determine the to can use the formula to determine the pattern with a to an use the formula to determine the pattern with a to an use the formula to determine the to can use the formula to determine the pattern with a to an use the service other other other other serving the sequence is representing the sequence is convergent or divergent.(1.1.2.1.3 Interpret solutions to presenting the pattern with a equations solving the pattern. You can also determine of the pattern is linear or diver epring the graphing. substitution and use special convergent or divergent.A1.1.2.1.3 Interpret solutions to presenting the sequence is equations (interest equations (interest erepresenting the sequence is convergent or divergent.A1.1.2.2.1 Write and/or Solve a syntem solutions to presenting the sequence is equations (interest equations (interest erepresenting the sequence is erepresenting the sequence is er	rr	40.0 Euton 1				Europeandere and
Pascal's Triangle 10.7: Prod by Mathematical Inductionnumerical pattems involving real number operation.expression.sum of rectangular areas under the curveMultipliers. Write an expression.10.1Number operations and multiplication.)A1.1.2.1.1A1.1.2.1.1an expressionsuch as addition and multiplication.)0Why is it helpful to represent a numeric pattern with a formular Vou can find any term. If given a term. you can use the formulaA1.1.2.1.2Use and/or identify an algebraic property on can use the formulaA1.1.2.1.3Multipliers. Write answer: By using a fractionsMultipliers. Write answer: By using a fractionsHave each group expression using the method for which their group10.5: Recognize anales determine otherA1.1.2.1.3Use and/or identify an algebraic property on can use the formulaA1.1.2.1.3Compare the expressions and the context of the problem situations only.Compare the expression and the context of the problem situations only.On the board the problem situations only.0Onter representing the pattern you can in the pattern such as sequencesA1.1.2.2.1Multipliers.Multipliers.10.6: Use Pascal's convergent or divergent or whether the sequence is convergent or divergent or whether the sequence is convergent or divergent or 		10.6 Extend:	mathematically?	Simplify/reduce a	over a specified	Expanders and
Interpretationinvolving real number operations such as addition and multiplication.)A1.1.2.1.1areas under the curveareas under the curvean expression such as (2x + y)5Why is the hipful to represent a numeric pattern with a formula to can use the formula to determine the location of the term characteristics of the pattern such as whether the sequence representing the pattern with a formula to determine characteristics of the pattern such as whether the sequence representing the pattern is linear or quations only.A1.1.2.1.1 A1.1.2.1.3 Interpret solutions to problems inthe context of the problem situations (linear equations only).A1.1.2.1.3 Interpret solutions to problems inthe context of the problem situations (linear equations only).A1.1.2.2.1 White and/or solve a system of linear equations (including graphing, substitution and/or elimination (linear equations (including problems inteacors).A1.1.2.2.1 A1.1.2.2.2 Interpret solutions to problems inteacors and and balance of a loanareas under the conceptually how mathematical induction vorks, set up a series of set						
Mathematicai Inductionnumber operations such as addition and multiplication.A1.1.2.1.1curvesuch as (2x + y)5• Write, solve and/or apply a multiplication.• Write, solve and/or apply a linear equation formular (Sample answer: By using a formular to represent a numeric pattern, you can find any term. If given a term, you can use the formular to determine the location of the term other characteristics of the pattern such as other and formular the pattern is linear representing the pattern is linear or whether the seriesA1.1.2.1.2 Use and/or apply answer: By using a diserial pattern such as other and including problem situations.curve a such as (2x + y)5 on the board.such as (2x + y)5 on the board.• Write repeating decimals as find any term. If in the pattern. You can also determine the pattern such as other in the pattern such as other in the pattern such as other pattern is linear representing the pattern is linear or whether the series representing the pattern is linear or divergent.)A1.1.2.1.3 the pattern such as other problem situation (linear equations only).curve and or elimination such as other to investigate limits equations only.curve expression sand the imes the approaching them and/or such as such as other on the pattern such as other to investigate limits sequence as convergent orcurve expression such as (2x + y)5 on the board.• Other characteristics of the pattern is linear or representing the pattern is linear or representing the pattern is linear or representing the pattern is linear or representing the pattern is linear or representing the se				expression.	•	
Inductionsuch as addition and multiplication.)Write, solve and/or apply a linear equation (including problem situations),• 10.4: Find sums of infinite geometric series• on the board• Why is it helpful to represent a numeric pattern. You can to determine the location of the termine other the formula to determine the location of the termine other the pattern. You can also determine other the pattern such as whether the sequence representing the pattern is linear or whether the series convergent or divergent.)Write, solve and/or apply a linear equations only. Use and/or other the series of solve and/or apply a linear equations only. Interpret solutions to problem situation (linear equations only).• 10.4: Find sums of infinite geometric series • Write repeating depattern. You can also determine other characteristics of the pattern the pattern is linear or whether the series convergent or divergent.)• Write representing the sequence representing the sequence is convergent or divergent.)• 10.4: Find sums of including problem situations linear of series and balance of a loan secure or representing the sequence is convergent or• 11.2.2.1 Write and/or solve a system of linear equations (including problem situation (limit systems to 2 linear equations to problems ituation (insert envirtue)• 10.6: Use Pascal's triangle to expand powers of binomials osserve. Tell students that you them they observed. That the problem situation powers of binomi		2				
 and multiplication.) Why is it helpful to represent a numeric pattern with a formula to represent a numeric pattern, you can auswer. By using a formula to represent a numeric pattern, you can use the formula to determine the location of the termine in the pattern. You can also determine the the pattern. You can also determine the pattern such as whether the sequence representing the pattern is linear or whether the the sequence is convergent or whether the contex of the problem is ithe contex of the problem is the cont			•			
 Why is it helpful to pattern with a formula 7 (Sample answer: By using formula to pattern, you can if nd any term, you can use the formula to determine the in the pattern. You can also determine the pattern such as whether the sequence representing the pattern is linear (characteristics of the pattern such as whether the series sequence representing the pattern silinear of the pattern such as whether the series sequence is convergent or divergent.) Why is it helpful to interpattern, you can interpattern, you can interpattern, you can interpattern, you can interpattern, you can use the formula to determine the sequences representing the pattern silinear of the problem situations whether the series representing the pattern silinear equations (including problems) is the context of the problem situations (including problems) is the context of the problem situations (including problems) is the context of the problem situations (including problems) is the context of the problem situations induction works, set up a series of sequences representing the sequence is convergent or divergent.) A1.1.2.2.1 A1.1.2.2.2 		Induction				
represent a numeric pattern with a formula? (Sample answer: By using a formula to represent a numeric pattern, you can an use the formula to determine the location of the term. to determine the can use the formula a to determine the can a bo determine characteristics of the pattern such as whether the sequence representing the pattern such as whether the series representing the sequence is representing the sequence is convergent or divergent.)enterns to determine divergent.extuations).Write repeating decimals as tractions the method for which their group is named. Compare the expressions and the times the groups take to find them.11.1.2.1.3 (linear equations only).A1.1.2.1.3 (linear equations only).Note representing the sequence equations (nichica) the pattern such as whether the sequenceA1.1.2.2.1 (linear equations only).Write and/or demitify an algebraic property to equations only.Note representing the sequence sequenceA1.1.2.2.1 (linear equations only).Write and/or demitify an algebraic property to equations (including problems in the context of the problem situations).Note representing the sequence is convergent or divergent.)A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation of grameNote representing the sequence is convergent or divergent.)A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation of grameNote representing the sequence is convergent or divergent.)A1.1.2.2.2 Interpret solutions to problems in the context of the problems situationNote representing t					-	
pattern with a formula? (Sample answer: By using a formula to represent a numeric pattern, you can ucan use the formula to determine the in the pattern. you can use the formula to determine the pattern suchas whether the sergence representing the pattern is linear or whether the sergence representing the sequence is convergent or divergent.)A1.1.2.1.2 Use and/or identify an algebraic property to justify any step in an equation solving process (inear equations only).Hat is in the method for which their group is named. Compare the expressions and the times the groups take to find them.0A1.1.2.1.3 Interpret solutions to problem situation (inear equations only).A1.1.2.1.3 Approaching them.Hat is the context of the problem situation and/or elimination (limit systems to 2 linear equations.).Hat is the context of the problem situation and/or elimination (limit systems to 2 linear equations.).Hat is the context of the problem situation them the serve and balance of a powers of binomials expression and them.He time method for which their group is named.10.5He conging the problem situations (mather the serve problem situations)A1.1.2.2.1 Write and/or solve a system of linear equations.Hat is the method for constraints as the interve to a linear on behind the other. Knock the frist domino over.10.6He constraints and problem situation (lime of ways the problem situation)Hat is the context of the problem situation onder elimination (limit system to the context of the problem situation)Hat is the is the other consthe the problem situation <t< td=""><td></td><td></td><td></td><td></td><td></td><td>•</td></t<>						•
formular (Sample answer: By using a formula to represent a numeric pattern, you can use the formula to determine the location of the termine the pattern soluca other characteristics of the pattern is linear or whether the sequence is sequence is convergent or divergent.)41.1.2.1.2 use and/or identify an algebraic property to justify any step in an equation solving process (linear equations only).tractions tractionswhich their group is named. Compare the expanded expressions and the times the groups take to find the mem.0can use the formula to determine the location of the termine other characteristics of the pattern silinear or whether the sequence is convergent or divergent.)A1.1.2.2.1 A1.1.2.2.1Tractions use and/or identify an algebraic property to justify any step in an equations to problems in the context of the problem situation (linear equations) using graphing, substitution and/or elimination (limit systems to 2 linear equations).that the context of the problem situation problems in the context of the problems in the context of the problem of the agrie and ag				situations).		
 answer: By using a formula to represent a numeric pattern, you can find any term, you can use the formula to determine the location of the term in the pattern. You can also determine the characteristics of the pattern such as whether the serguence is convergent or divergent.) A1.1.2.2.1 A1.1.2.2.2 A1.1.2.2.5 A1.1.2.2.6 A1.1.2.2.6 A1.1.2.2.6 A1.1.2.2.7 A1.1.2.2.7 A1.1.2.2.6 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.2 A1.1.2.2.2 A1.1.2.2.2 A1.1.2.2.2 A1.1.2.2.4 A1.1.2.2.4 A1.1.2.2.5 A1.1.2.2.5 A1.1.2.2.6 A1.1.2.2.6 A1.1.2.2.7 A1.1.2.2.7 A1.1.2.2.8 A1.1.2.2.8 A1.1.2.2.9 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.6 A1.1.2.2.6 A1.1.2.2.7 A1.1.2.2.7 A1.1.2.2.8 A1.1.2.2.9 A1.1.2.2.9 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.1 A1.1.2.2.2<						
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sequence representing the pattern is linear or whether the series representing the sequence is convergent or divergent.)					 10.6: Use Pascal's 	
representing the pattern is linear or whether the series representing the sequence is convergent or divergent.)						,
 pattern is linear or whether the series representing the sequence is convergent or divergent.) graphing, substitution and/or elimination (limit systems to 2 linear equations). use the Binomial Theorem to expand powers of binomials Extend 10.6: Use combinations and Pascal's triangle to determine the number of ways the prizes of a game use the Binomial Theorem to expand powers of binomials theorem to expand powers of agame 						
whether the series representing the sequence is convergent or divergent.)and/or elimination (limit systems to 2 linear equations).Theorem to expand powers of binomials Extend 10.6: Use combinations and Pascal's triangle to determine the number of ways the prizes of a gamefirst domino over. Ask students to describe what they observe. Tell students that you think, based on what was just observed, that the 29th domino will			•			
representing the sequence is convergent or divergent.) A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear equations). Ask students to describe what they observe. Tell students that you think, based on what was just observed, that the prizes of a game prizes of a game powers of binomials equations and problems in the context of the problem situation (systems of 2 linear equations). Ask students to describe what they observe. Tell students that you think, based on what was just observed, that the prizes of a game prizes o			whether the series			first domino over.
Sequence is convergent or divergent.)equations).Extend 10.6: Use combinations and Pascal's triangle to determine the number of ways the prizes of a gamedescribe what they observe. Tell students that you think, based on what was just observed, that the 29th domino will			representing the	systems to 2 linear	-	Ask students to
convergent or divergent.)A1.1.2.2.2combinations and Pascal's triangle to determine the number of ways the prizes of a gameobserve. Tell students that you think, based on what was just observed, that the			sequence is	equations).	-	
divergent.) A1.1.2.2.2 Interpret solutions to problems in the context of the problem situation (systems of 2 linear						observe. Tell
determine the problems in the context of the problem situation (systems of 2 linear			divergent.)			
of the problem situation (systems of 2 linear prizes of a game 29th domino will						think, based on
(systems of 2 linear prizes of a game 29th domino will						
					can be chosen	
equations only).				equations only).		
statements by using you knock over the						
A1.1.5.1.1 mathematical						
write or solve compound up 30 dominos to						
inequalities and/or graph bioprove test and prove						
ulei soluion sets on a statementa hy						
finding of the findin						
absolute value counterexemple						
				inequalities).	counterexample	
happen to the						
A1.1.3.1.2 500th domino. Tell						
Identify or graph the students that they						
solution set to a linear just used inductive						
inequality on a number reasoning.				inequality on a number		reasoning.

	I		
		line.	 Explain that when
			they say that a
		A1.1.3.1.3	mathematical
		Interpret solutions to	statement is true
		problems in the context	for $n = 1$, it is the
		of the problem situation	same as proving
		(limit to linear	the first domino
		inequalities).	can be knocked
			down. Then
		A1.1.3.2.1	proving it is true
		Write and/or solve a	for k + 1 if it is true
		system of linear	for k, means that
		inequalities using	you have proved
		graphing (limit systems	that if any domino
		to 2 linear inequalities).	falls, the next one
		. , ,	in line will fall. So,
		A1.1.3.2.2	if #1 falls, #2 will
		Interpret solutions to	fall, and if #2 falls,
		problems in the context	then #3 will fall,
		of the problem situation	and so on.
		(systems of 2 linear	Option 3: English
		inequalities only).	Learners: Have
			students create a
		A1.2.1.1.1	list of the different
		Analyze a set of data for	mathematical
		the existence of a	notations
		pattern and represent	(symbols) as they
		the pattern algebraically	are presented in
		and/or graphically.	this chapter. As
		01 5	each notation is
		A1.2.1.1.2	presented, ask
		Determine if a relation is	students to record
		a function given a set of	the notation, an
		points or a graph.	example, its name,
		1	and why it is
		A1.2.1.1.3	useful in their
		Identify the domain or	study of
		range of a relation (may	mathematics.
		be presented as ordered	Option 4: Beyond
		pairs, a graph, or a	Level: With
		table).	manipulatives or
		,	sketches, students
		A1.2.1.2.1	use various
		Create, interpret and/or	geometric
		use the equation, graph	elements to model
		or table of a linear	problems involving
		function.	arithmetic or
			geometric
		A1.2.1.2.2	sequences. Then
		Translate from one	have students
		representation of a linear	write a general
		function to another	witte a general
II	I		

	(graph, table and	rule for the nth
	equation).	term of their
		sequence. For
	A1.2.2.1.1	example, the
	Identify, describe and/or	figures below
	use constant rates of	show an arithmetic
	change.	sequence in the
		number of red
	A1.2.2.1.2	dots. The rule for
	Apply the concept of	the sequence is an
	linear rate of change	= 3 + 2(n - 1).
	(slope) to solve	Interpersonal
	problems.	Learners Have
		students in small
	A1.2.2.1.3	groups discuss
	Write or identify a linear	any confusions
	equation when given the	they may have
	graph of the line 2 points	about the key
	on the line, or the slope	concepts for
	and a point on a line,	arithmetic and
	(Linear equation may be	geometric
	in point-slope, standard	sequences.
	and/or slope-intercept	Suggest they help
	form).	each other
		organize and
	A1.2.2.1.4	complete their
	Determine the slope	notes on these
	and/or y-intercept	topics.
	represented by a linear	Interpersonal
	equation or graph.	Learners Discuss
		the difference
	A2.1.3.1.1	between a
	Write and/or solve	sequence and a
	quadratic equations	series, and ask
	(including factoring and	students to
	using the Quadratic	suggest ways to
	Formula).	remember which is
	,	which.
	A2.1.3.1.2	If you think
	Solve equations	students might be
	involving rational and/or	interested in
	radical expressions (e.g.,	learning how this
	10/(x + 3) + 12/(x - 2) =	lesson applies to
	$1 \text{ or } \sqrt{(x^2 + 21x)} = 14$).	real-world
		situations, then
	A2.1.3.1.3	have students
	Write and/or solve a	research how
	simple exponential or	biologists and
	logarithmic equation	ecologists use
	(including common and	geometric series in
	natural logarithms).	their work to count

A2.1.3.1.4and predict the population changes for various organisms.Image: Second	
linear or exponential growth or decay (including problem situations).changes for various organisms.Logical Learners Have students research and read about the famous mathematical puzzle called a change in a secondLogical Learners Have students research and read about the famous puzzle called Zeno's paradox.	
growth or decay (including problem situations).various organisms.A2.1.3.2.1 Determine how a change in one variable relates to a change in a secondvarious organisms.Use of the second sec	
growth or decay (including problem situations).various organisms.A2.1.3.2.1 Determine how a change in one variable relates to a change in a secondvarious organisms.Use of the second sec	
(including problem situations).• Logical Learners Have students research and read about the famous mathematical puzzle called Zeno's paradox.	
situations). Have students A2.1.3.2.1 about the famous Determine how a change mathematical in one variable relates to puzzle called a change in a second Zeno's paradox.	
A2.1.3.2.1 Determine how a change in one variable relates to a change in a second Tresearch and read about the famous mathematical puzzle called Zeno's paradox.	
A2.1.3.2.1about the famousDetermine how a changemathematicalin one variable relates topuzzle calleda change in a secondZeno's paradox.	
Determine how a change in one variable relates to a change in a secondmathematical puzzle called Zeno's paradox.	
in one variable relates to puzzle called a change in a second Zeno's paradox.	
a change in a second Zeno's paradox.	
	l l
variable (e.g., y=4/x, if x doubles, what happens discuss this story	
to y?). of the tortoise's	
race in terms of	
A2.1.3.2.2 the content of this	
Use algebraic processes lesson.	
to solve a formula for a	
given variable (e.g., • Kinesthetic	
solve d = rt for r). Learners Have	
students research	
A2.2.1.1.1 and then play the	
Analyze a set of data for game Tower of	
the existence of a Hanoi. The object	
pattern and represent of the Tower of	
the pattern with a rule Hanoi game is to	
algebraically and/or move a stack of 8	
graphically. disks of graduated	
sizes from one of	
A2.2.1.1.2 3 pegs to a vacant	
Identify and/or extend a peg in the fewest	
pattern as either an number of moves	
arithmetic or geometric by following these	
sequence (e.g., given a rules:	
geometric sequence, find • You may move	
A2.2.1.1.3 a time.	
diffeenteati.	
A2.2.1.1.4 • A smaller disk	
Identify and/or determine	
Identify and/or determine on top of a	
the characteristics of an larger disk, but	
exponential, quadratic, not vice versa	
or polynomial function (a p_intervale of	
(e.g., intervals of sequence like 2, 5,	
increasing/decreasing, 7 12 10 31	
Intercepts, zeros, and on the board and	
asymptotes). see if students can	

Create, interpret and/orpateri. Such ause the equation, graphsequence, called aor table of a polynomialLucas sequence,function (includingis similar to thequadratics).sequence, called aA2.2.2.1Create, interpret and/orUse the equation, graphthird term is theor table of a polynomialsum of the twoor table of ansum of the twoor table of ansum of the twoor table of ansum of the twoexponential orterms immediatelylogarithmic functionpreceding it. Haveinterpret minimum andthem write theirnatural logarithmic functionany two startingbettermine, use and/ortermsinterpret minimum anderg apointinterpret minimum anderg apointmaximum values over astudents theopportunity to becreative,exponential orstudents thelogarithmic function.to makeA2.2.2.1.4up a play or agraph of a polynomial,creative,exponential orstudents thelogarithmic function.the makeA2.2.2.1.4up a play or atranslate a polynomial,exponential orlogarithmic function frompatterns in thelogarithmic function fromstudents toone representation toBiomail Theorem.and equation),and equation,least three of thethe Concepteffect of changingSuumary on pageparters w		
use the equation, graph sequence, called a or table of a polynomial Lucas sequence, function (including is similar to the quadratics). Fibonacci ac2.2.1.2 each term Create, interpret and/or beginning with the use the equation, graph third term is the or table of an sum of the two exponential or terms immediately exponential or preceding it. Have (including common and natural logarithmic function own Lucas acquert and therapion sequences with arry two starting Determine, use and/or interpret minimum and interpret minimum and specified interval of a opportunity to be creative, is graph of a polynomial, exponential or Then have pairs of students the opportunity to be students work together to make describes the bogarithmic function. pop m that describes the describes the bogarithmic function from one representation to another (graph, table and equation). poem that describes the blogarithmic function from one representation to an dequation). Binomial Theorem. A2.2.2.1 five items listed in the destribes the blogarithmic function from one representation to an dequation). Binomial Theorem. A2.2.2.1 five items listed in the destribes	A2.2.2.1.1	identify the
or table of apolynomial quadratics).Lucas sequence, is similar to the Fibonacci sequence in that each termA2.2.2.1.2aeach term beginning with the thid term is the or table of an or table of an or table of an natural logarithmic functionbeginning with the thid term is the sum of the two terms immediately preceding it. Have terms immediately terms immediately 		
function (including quadratics), is similar to the Fibonacci sequence in that A2.2.2.1.2 Create, interpret and/or use the equation, graph or table of an sum of the two beginning with the third term is the or table of an sum of the two exponential or terms immediately logarithmic function (including common and natural logarithms). terms immediately A2.2.2.1.3 own hite wo exponential or terms immediately Determine.use and/or interpret minimum and maximum values over a specified interval of a opportunity to be graph of a polynomial, exponential or erf you want to give students the opportunity to be creative, A2.2.2.1.4 Translate a polynomial, exponential or erf the make to graph of a polynomial, exponential or Then have pairs of students work together to make Iogarithmic function. table a polynomial, exponential or poem that describes the logarithmic function from one representation to another (graph, table and equation), patterns in the Binomial Theorem. another (graph, table and equation), A2.2.2.2.1 five items listed in incorporate at least three of the five items listed in parameters within a Summary on page 701 of the Student		sequence, called a
quadratics).Fibonacci sequence in thatA2.2.2.1.2each termCreate, interpret and/or use the equation, graph or table of an exponential or logarithmic function natural logarithms).each termA2.2.2.1.3sum of the two terms immediately logarithms).sum of the two terms immediately logarithms).A2.2.2.1.3own Lucas sequences with antural logarithms).sequences with any two starting termsA2.2.2.1.3any two starting termsterms sequences with any two starting termsDetermine, use and/or maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function.ethor was termsA2.2.2.1.4terms termsoportunity to be orreative, termsA2.2.2.1.4to get the option termsterms termsA2.2.2.1.4to get the option termsterms termsBack and the option maximum function.terms termsA2.2.2.1.4to get the option termsterms termsCreate a polynomial, exponential or logarithmic function.terms termsA2.2.2.1.4to get the option termsterms termsA2.2.2.1.4to get terms termsterms termsA2.2.2.1to get terms terms		
A2.2.2.1sequence in thatA2.2.2.1create, interpret and/or use the equation, graph or table of an exponential or (including common and natural logarithmic, function (including common and natural logarithmic).sum of the two terms immediately preceding it. Have terms immediately preceding it. Have terms immediately sequences with ary two starting terms interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential orsequences with ary two starting termsA2.2.2.1.3 Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential oropportunity to be creative, together to make together to makeA2.2.2.1.4 Ugarithmic function.Translate a polynomial, describes the logarithmic function from logarithmic function from and exponential or logarithmic function from logarithmic function from and equation).Translate a polynomial, describes the Binomial Theorem. Ask students to and equation).A2.2.2.2.1 ldentify or describe the effect of changing parameters within aTo the Student		is similar to the
A2.2.2.1.2 each term Create, interpret and/or beginning with the tuse the equation, graph sum of the two exponential or terms immediately logarithmic function preceding it. Have (including common and them write their natural logarithms). sequences with A2.2.2.1.3 own Lucas A2.2.2.1.3 any two starting Determine, use and/or terms interpret minimum and eff you want to give specified interval of a opportunity to be graph of a polynomial, creative, exponential or own the logarithmic function. students work together to make up a jingle or a opportunity to be oreative, exponential or bannal logarithmic function. students work together to make up a jingle or a opport that opport the exponential or bannal logarithmic function from patterns in the one representation or bannal opporteses the patterns in the	quadratics).	Fibonacci
Image: Create, interpret and/or use the equation, graph or table of an exponential or (including common and natural logarithmic function (including common and natural logarithmics). beginning with the third term is the sum of the two terms immediately logarithmic function (including common and natural logarithms). A2.2.2.13 own Lucas sequences with any two starting Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. of you want to give students the opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation). maximum values over a students to incerporate at least three of the five items listed in least three of the five items listed in least three of the effect of changing parameters within a		sequence in that
use the equation, graph or table of an exponential or third term is the sum of the two terms immediately preceding it. Have them write their 0 (including common and natural logarithms). preceding it. Have them write their 0 0 own Lucas sequences with any two starting 1 Determine, use and/or interpret minimum and maximum values over a own Lucas specified interval of a opportunity to be creative, students the syecified interval of a opportunity to be creative, 0 digraph of a polynomial, exponential or logarithmic function. Then have pairs of students work together to make 42.2.2.1.4 up a jingle or a poem that describes the logarithmic function from one representation to and equation). poem that describes the logarithmic function from one representation to and equation). paire the isted in licetorprate at least three of the effect of changing parameters within a	A2.2.2.1.2	each term
or table of ansum of the twoexponential orterms immediatelylogarithmic functionpreceding it. Have(including common and natural logarithmis).them write theirA2.2.2.1.3sequences with any two startingDetermine, use and/ortermsinterpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential orIf you want to give students the to be creative, translate a polynomial, exponential orA2.2.2.1.4 Translate a polynomial, exponential orThen have pairs of students work together to make to a students the students the to a students the students the to a students the students to reative, to be creative, translate a polynomial, exponential orA2.2.2.1.4 Translate a polynomial, exponential orpoem that describes the Binomial Theorem. Ask students to another (graph, table and equation).A2.2.2.1 Identify or describe the effect of changing parameters within aAsk students to the Surmary on page page	Create, interpret and/or	beginning with the
exponential or terms immediately logarithmic function induction induction induction indegraph.table indegraph.table <td>use the equation, graph</td> <td>third term is the</td>	use the equation, graph	third term is the
logarithmic function (including common and natural logarithms). preceding it. Have them write their A2.2.2.1.3 own Lucas sequences with any two starting Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. If you want to give students the opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function form one representation to another (graph, table and equation). The have pairs of students the describes the lices t	or table of an	sum of the two
including common and natural logarithms). them write their own Lucas sequences with any two starting terms A2.2.2.1.3 any two starting terms Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. If you want to give students the opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 up a jingle or a polynomial, exponential or logarithmic function to another (graph, table and equation). Then have pairs of biomake to incorporate at least three of the five items listed in the five items listed in the Concept effect of changing parameters within a	exponential or	terms immediately
natural logarithms). own Lucas sequences with any two starting terms A2.2.2.1.3 betermine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or If you want to give students the opportunity to be creative, exponential or A2.2.2.1.4 opportunity to be creative, exponential or Then have pairs of students work together to make up a jingle or a poem that A2.2.2.1.4 up a jingle or a logarithmic function. poem that describes the logarithmic function from one representation to another (graph, table and equation). poem that binomial Theorem. A2.2.2.2.1 lieast three of the least three of the five it three is listed in the Concept effect of changing parameters within a Thue have pairs of students to parameters within a	logarithmic function	preceding it. Have
natural logarithms). own Lucas sequences with any two starting terms A2.2.2.1.3 betermine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or If you want to give students the opportunity to be creative, exponential or A2.2.2.1.4 opportunity to be creative, exponential or Then have pairs of students work together to make up a jingle or a poem that A2.2.2.1.4 up a jingle or a logarithmic function. poem that describes the logarithmic function from one representation to another (graph, table and equation). poem that best opportunity to be creative, exponential or A2.2.2.2.1 linomial Theorem. Binomial Theorem. Ask students to incorporate at least three of the five i terms listed in the Concept effect of changing parameters within a Summary on page Summary on page	(including common and	them write their
A2.2.2.1.3 any two starting terms Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. • If you want to give students the opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 • Then have pairs of students work to get an opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 • Then have pairs of students work to get an opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 • opportunity to make to ma		own Lucas
A2.2.2.1.3 any two starting terms Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function. • If you mant to give students the opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 • Then have pairs of students work to get an opportunity to be creative, exponential or logarithmic function. • Then have pairs of students work to get an opportunity to be creative, exponential or logarithmic function. A2.2.2.1.4 • up a ingle or a poper that describes the logarithmic function from one representation to another (graph, table and equation). • poem that describes the logarithmic function to another (graph, table and equation). A2.2.2.1 five items listed in the concept the five items listed in the five items listed in the concept effect of changing parameters within a		sequences with
Determine, use and/or interpret minimum and maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function.If you want to give students the opportunity to be creative, opportunity to be creative, together to make up a jingle or a poem that describes the logarithmic function from one representation to another (graph, table and equation).ItemsA2.2.2.1 translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation).Translate at the describes the bit operation to another (graph, table and equation).A2.2.2.1 the the studentAz.2.2.2.1 the that describes the bit operation to another (graph, table and equation).A2.2.2.2.1 least three of the effect of changing parameters within aFive items listed in the Student		
Image: Second	Determine, use and/or	
maximum values over a specified interval of a graph of a polynomial, exponential or logarithmic function.students the opportunity to be creative, erreative, together to make up a jingle or a poem that describes the logarithmic function from one representation to and equation).Then have pairs of students work together to make up a jingle or a poem that describes the Binomial Theorem. Ask students to incorporate at least three of the effect of changing parameters within a	interpret minimum and	 If you want to give
graph of a polynomial, exponential or logarithmic function. A2.2.2.1.4 Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation). A2.2.2.1 function from one representation to another (graph, table and equation). A2.2.2.2.1 Ileast three of the five items listed in the Concept Summary on page parameters within a	maximum values over a	
 Exponential or logarithmic function. Then have pairs of students work together to make up a jingle or a poem that exponential or logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 ldentify or describe the effect of changing parameters within a Then have pairs of students work together to make up a jingle or a poem that describes the patterns in the Binomial Theorem. Ask students to incorporate at least three of the five items listed in the Concept Summary on page 701 of the Student 	specified interval of a	opportunity to be
exponential or logarithmic function.• Then have pairs of students work together to make up a jingle or a poem that describes the logarithmic function from one representation to another (graph, table and equation).• Then have pairs of students work together to make up a jingle or a poem that describes the Binomial Theorem.A2.2.2.2.1• Then have pairs of students work together to make up a jingle or a poem that describes the Binomial Theorem.A2.2.2.2.1• Ask students to incorporate at least three of the five items listed in the Concept effect of changing parameters within a	graph of a polynomial,	creative,
Iogarithmic function.students work together to make up a jingle or a poem that describes the logarithmic function from one representation to another (graph, table and equation).students work together to make up a jingle or a poem that describes the Binomial Theorem.A2.2.2.2.1 logarithmic function from one representation to another (graph, table and equation).poem that describes the Binomial Theorem.A2.2.2.2.1 ldentify or describe the effect of changing parameters within afive items listed in the ConceptYou of the Studentstudents on page	exponential or	
A2.2.2.1.4together to make up a jingle or a poem that describes the logarithmic function from one representation to another (graph, table and equation).together to make up a jingle or a poem that describes the Binomial Theorem.A2.2.2.2.1Items listed in incorporate at least three of the five items listed in the ConceptA2.2.2.2.1Items listed in the Concept effect of changing parameters within aA3.2.2.2.1Summary on page TO1 of the Student	logarithmic function.	
A2.2.2.1.4up a jingle or a poem that describes the logarithmic function from one representation to another (graph, table and equation).up a jingle or a poem that describes the patterns in the Binomial Theorem. Ask students to incorporate at least three of the five items listed in the Concept effect of changing parameters within aup a jingle or a poem that describes the patterns in the Binomial Theorem. Ask students to incorporate at least three of the five items listed in the Concept		
Translate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation).poem that describes the patterns in the Binomial Theorem. Ask students to incorporate at least three of the five items listed in the Concept effect of changing parameters within aTranslate a polynomial, exponential or logarithmic function from one representation to another (graph, table and equation).poem that describes the patterns in the Binomial Theorem. Ask students to incorporate at least three of the five items listed in the Concept Summary on page parameters within a	A2.2.2.1.4	
exponential or logarithmic function from one representation to another (graph, table and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a Five items listed in the Concept Summary on page 701 of the Student	Translate a polynomial,	
Image: state of the students logarithmic function from one representation to another (graph, table and equation). patterns in the Binomial Theorem. Ask students to and equation). another (graph, table and equation). Ask students to incorporate at least three of the five items listed in Identify or describe the effect of changing parameters within a five items listed in Summary on page	exponential or	
one representation to another (graph, table and equation). Ask students to incorporate at least three of the five items listed in ldentify or describe the effect of changing parameters within a Tot of the Student	logarithmic function from	
another (graph, table Ask students to and equation). incorporate at least three of the least three of the A2.2.2.2.1 five items listed in Identify or describe the the Concept effect of changing Summary on page parameters within a 701 of the Student		
and equation). A2.2.2.2.1 Identify or describe the effect of changing parameters within a incorporate at least three of the five items listed in the Concept Summary on page 701 of the Student		
A2.2.2.1least three of the five items listed in the ConceptIdentify or describe the effect of changing parameters within aSummary on page 701 of the Student		
A2.2.2.1five items listed inIdentify or describe thethe Concepteffect of changingSummary on pageparameters within a701 of the Student		
Identify or describe the effect of changing parameters within athe Concept Summary on page 701 of the Student	A2.2.2.1	
effect of changingSummary on pageparameters within a701 of the Student		
parameters within a 701 of the Student		
	family of functions (e.g.,	Edition.
$y = x^2$ and $y = x^2 + 3$, or • Kinesthetic		
$y = x^2$ and $y = 3x^2$). Learners Have		
students		
CC.2.2.HS.C.2 demonstrate proof	CC.2.2.HS.C.2	
Graph and analyze by induction by	Graph and analyze	
functions and use their organizing		
properties to make themselves into a		
connections between the line. Instruct each		
different representations. person to tell any		
message he hears		
CC.2.2.HS.C.4 to the person	CC.2.2.HS.C.4	
Interpret the effects behind him. Tell		
transformations have on the first person a		
functions and find the		

				inverses of functions. CC.2.2.HS.D.10		message. Explain that the first person telling the	
				Represent, solve and interpret equations/inequalities		next person assures that n = 1 is true. Your	
				and systems of equations/inequalities algebraically and graphically.		instructions to tell all messages heard to the next person assures	
				CC.2.2.HS.D.6 Extend the knowledge of rational functions to rewrite in equivalent forms.		that k + 1 is true.	
				CC.2.2.HS.D.7 Create and graph equations or inequalities to describe numbers or relationships.			
				CC.2.2.HS.D.8 Apply inverse operations to solve equations or formulas for a given variable.			
Week 31- 33 Statistics and Probability	 Patterns in information can be used to make wise decisions. Probability can be used to make predictions from patterns. Statistics can be manipulated to influence the behaviors or beliefs of an audience. 	11.1: Designing a Study 11.1 Extend: Graphing Simulations and Margin of Error 11.2: Distributions of Data 11.3 Probability Distributions 11.4: The Binomial Distribution 11.5:The Normal Distribution 11.5 Extend: Normal Approximation of Binomial Distributions	decisions? (Sample answer: You can look for trends, and	A1.1.1.5.1 Add, subtract and/or multiply polynomial expressions (express answers in simplest form – nothing larger than a binomial multiplied by a trinomial). A1.1.1.5.2 Factor algebraic expressions, including difference of squares and trinomials (trinomials limited to the form ax2+bx+c where a is equal to 1 after factoring out all monomial factors).	 11.1: Classify study types Design statistical studies Extend 11.1: Use a simulation to develop margins of error for various sizes of random samples 11.2: Use the shapes of distributions to select appropriate statistics Use the shapes of distributions to compare data 	• Kinesthetic Ask each student to use a tape measure to measure the distance around the wrists of 15 classmates to the nearest tenth of a centimeter. Have students find the mean and standard deviation of their data. Then have them determine if their data appears to be normally	Homework (Teacher Editions, Suggested HW at beginning of each problem set) Participation Quiz (Mid Chapter Quiz/Test) Tests (Form 1, 2A, 2B, 2C)
		11.6: Confidence Intervals and Hypothesis Testing	then make a decision based on what has happened in the past and/or is reflected in the	A1.1.1.5.3 Simplify/reduce a rational algebraic expression.	 11.3: Construct a probability distribution Analyze a probability 	distributed, positively skewed, or negatively skewed. • Visual/Spatial	

		1 10 2 10 20 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
information.)	A1.1.2.1.1	distribution and its	Have students
How can probability	Write, solve and/or apply	summary statistics	work in pairs to
be used in decision	a linear equation	 11.4: Identify and 	make up a
making? (Sample	(including problem	conduct a binomial	crossword puzzle
answer: You can	situations).	experiment	using the terms
use probability to		 Find probabilities 	studied in this
predict the most	A1.1.2.1.2	using binomial	chapter. Use
likely outcomes,	Use and/or identify an	distributions	either the
and then make a	algebraic property to	 11.5: Use the 	definition or an
decision based on	justify any step in an	Empirical Rule to	example of the
those findings.)	equation solving process	analyze normally	terms in the
Can statistics lie?	(linear equations only).	distributed variables	across and down
(Sample answer:		 Apply the standard 	hints. Make
Statistics can "lie"	A1.1.2.1.3	normal distribution	photocopies of the
when they are	Interpret solutions to	and z-values	puzzle to distribute
manipulated and	problems in the context	• Extend 11.5: Use a	to the class. Ask
then used to	of the problem situation	normal distribution	students to keep
influence the	(linear equations only).	to approximate a	the puzzles to use
intended audiences'		binomial distribution	as a chapter
beliefs and	A1.1.2.2.1	• 11.6: Find	review.
behaviors.)	Write and/or solve a	confidence intervals	Option 2
	system of linear	for normally	Approaching
	equations (including	distributed data	Level:
	problem situations) using	Perform hypothesis	Visual/Spatial
	graphing, substitution	tests on normally	Have students
	and/or elimination (limit	distributed data	work in pairs to
	systems to 2 linear		make up a
	equations).		crossword puzzle
			using the terms
	A1.1.2.2.2		studied in this
	Interpret solutions to		chapter. Use
	problems in the context		either the
	of the problem situation		definition or an
	(systems of 2 linear		example of the
	equations only).		terms in the
			across and down
	A1.1.3.1.1		hints. Make
	Write or solve compound		photocopies of the
	inequalities and/or graph		puzzle to distribute
	their solution sets on a		to the class. Ask
	number line (may include		students to keep
	absolute value		the puzzles to use
	inequalities).		as a chapter
	444949		review.
	A1.1.3.1.2		Options 3 English
	Identify or graph the		Learners: Ask
	solution set to a linear		students to work
	inequality on a number		with a partner.
	line.		One partner writes
	A11212		an expression,
	A1.1.3.1.3		such as 12C3, and
	Interpret solutions to		

problems in the context	
of the problem situation	
(limit to linear	reads the notation
inequalities).	aloud (for
	example, "the
A1.1.3.2.1	number of
Write and/or solve a	combinations of 12
system of linear	items taken 3 at a
inequalities using	time") and
graphing (limit systems	calculates the
to 2 linear inequalities).	value. 220 The
	partners discuss
A1.1.3.2.2	and correct this
Interpret solutions to	value as
problems in the context	necessary. Then
of the problem situation	
(systems of 2 linear	roles.
inequalities only).	 Option 4 Beyond
	Level: Ask
A1.2.1.1.1	students to make
Analyze a set of data for	or a chart showing
the existence of a	the relationship
pattern and represent	between the
the pattern algebraically	y binomial
and/or graphically.	coefficients and
	combinatorial
A1.2.1.1.2	notation.
Determine if a relation i	
a function given a set o	f Learners Divide
points or a graph.	students into small
	groups. Have each
A1.2.1.1.3	group design a
Identify the domain or	survey question
range of a relation (mag	y and practice
be presented as ordere	asking it in such a
pairs, a graph, or a	way that there is
table).	bias built into the
	tone of voice and
A1.2.1.2.1	facial expression
Create, interpret and/or	
use the equation, graph	
or table of a linear	ask other groups
function.	the question and
	record their
A1.2.1.2.2	answers. As a
Translate from one	class, discuss
representation of a line	
function to another	answers
(graph, table and	corresponded to
equation).	the bias that the
440044	question was
A1.2.2.1.1	

Г			
	Identify, describe and/or	designed to elicit.	
	use constant rates of	 Extension Have 	
	change.	students	
		investigate	
	A1.2.2.1.2	techniques that	
	Apply the concept of	could be used to	
	linear rate of change	select random	
	(slope) to solve	samples. For	
	problems.	example, a	
		random number	
	A1.2.2.1.3	table from the	
	Write or identify a linear	appendix of a	
	equation when given the	statistics text or	
	graph of the line 2 points	the random	
	on the line, or the slope	number generator	
	and a point on a line,	of a spreadsheet	
	(Linear equation may be	or calculator could	
	in point-slope, standard	be used.	
	and/or slope-intercept	 Interpersonal 	
	form).	Learners Have	
	,	students work in	
	A1.2.2.1.4	pairs to think of	
	Determine the slope	examples of data	
	and/or y-intercept	that may have	
	represented by a linear	distributions that	
	equation or graph.	are symmetric,	
	oquation of graphi	negatively	
	A2.1.3.1.1	skewed, or	
	Write and/or solve	positively skewed.	
	quadratic equations	Extension Have	
	(including factoring and		
	using the Quadratic	students complete Exercise 14.	
	Formula).		
	ronnula).	Examples of data	
	A2.1.3.1.2	that may have	
	Solve equations	bimodal	
	involving rational and/or	distributions are	
	radical expressions (e.g.,	the annual tuitions	
	10/(x + 3) + 12/(x - 2) =	for private and	
	1 or $\sqrt{(x^2 + 2)^2 + 12/(x^2 - 2)^2}$	public schools, the	
	$1 \text{ or } (A \ge C \text{ is } (A \ge C $	selling prices for	
	A2.1.3.1.3	suburban and	
	Write and/or solve a	urban houses, and	
	simple exponential or	the heights of 6th	
	logarithmic equation	grade and 12th	
	(including common and	grade students.	
	natural logarithms).	Have students	
	naturai ioyantinins).	think of other	
	421214	examples that may	
	A2.1.3.1.4	result in bimodal	
	Write, solve and/or apply	distributions.	
	linear or exponential	 Social Learners It 	
	growth or decay		

			
		(including problem	is important to be
		situations).	aware that some
			students may have
		A2.1.3.2.1	cultural or familial
		Determine how a change	prohibitions
		in one variable relates to	against cards,
		a change in a second	dice, or gambling
		variable (e.g., y=4/x, if x	of any kind.
		doubles, what happens	Explain that,
		to y?).	historically, the
		(o y .).	laws of probability
		A2.1.3.2.2	were actually
		Use algebraic processes	developed in the
		to solve a formula for a	context of
		given variable (e.g.,	gambling but are
		solve $d = rt$ for r).	now used in many
			other ways,
		A2.2.1.1.1	including medicine
		Analyze a set of data for	and meteorology.
		the existence of a	Kinesthetic
		pattern and represent	Learners Have
		the pattern with a rule	students in small
		algebraically and/or	groups do a
		graphically.	binomial
			experiment by
		A2.2.1.1.2	tossing a ball into
		Identify and/or extend a	a wastebasket
		pattern as either an	about 20 times to
		arithmetic or geometric	establish the
		sequence (e.g., given a	probability of
		geometric sequence, find	scoring a goal.
		the 20th term).	Then have them
			find the probability
		A2.2.1.1.3	that they will score
		Determine the domain,	exactly 4 goals in
		range or inverse of a	
		relation.	8 tries.
			If students need
		42.2.1.1.4	an aid in drawing a
		A2.2.1.1.4	normal curve, then
		Identify and/or determine	it may be useful to
		the characteristics of an	know that the
		exponential, quadratic,	concave side of
		or polynomial function	the curve switches
		(e.g., intervals of	from facing
		increasing/decreasing,	downward to
		intercepts, zeros, and	facing upward at
		asymptotes).	points that are one
			standard deviation
		A2.2.2.1.1	from the mean.
		Create, interpret and/or	Drawing a normal
		use the equation, graph	curve for each
		or table of a polynomial	
	1		

	function (including	problem can help
	quadratics).	students with their
		estimates.
	A2.2.2.1.2	 Verbal/Linguistic
	Create, interpret and/or	Learners The
	use the equation, graph	formal conclusion
	or table of an	of a hypothesis
	exponential or	test is stated as
	logarithmic function	"Reject the null
	(including common and	hypothesis" or "Do
	natural logarithms).	not reject the null
		hypothesis."
	A2.2.2.1.3	Students should
	Determine, use and/or	always restate
	interpret minimum and	conclusions in
1	maximum values over a	their own words.
	specified interval of a	Extension When
	graph of a polynomial,	the null hypothesis
	exponential or	is rejected when it
	logarithmic function.	is actually true, the
		result is called a
	A2.2.2.1.4	Type I error. When
	Translate a polynomial,	the null hypothesis
	exponential or	is not rejected
	logarithmic function from	when it is actually
	one representation to	false, the result is
	another (graph, table	called a Type II
	and equation).	error. Have
		students explore
	A2.2.2.1	the risks of making
	Identify or describe the	Type I and Type II
	effect of changing	errors with
	parameters within a	different significant
	family of functions (e.g.,	levels. What
	$y = x^2$ and $y = x^2 + 3$, or	conclusions can
	$y = x^2$ and $y = 3x^2$).	they make? The
		risk of making a
	CC.2.2.HS.C.2	Type I error is
	Graph and analyze	identical to the
	functions and use their	significance level.
	properties to make	Reducing the risk
	connections between the	of a Type I error
	different representations.	increases the risk
		of a Type II error
	CC.2.2.HS.C.4	by widening the
	Interpret the effects	acceptance level.
	transformations have on	
	functions and find the	
	inverses of functions.	
	CC.2.2.HS.D.10	
	Represent, solve and	

inverse is the	Trigonomotria	arankı multinli in e	aituationa)	functions for	Lesson 12.5
inverse is the	Trigonometric	graph; multiplying a	situations).	functions for	Lesson 12-5,
identity function;	Graphs	function by a	A11212	general angles	using straws to
the graphs are	12.9: Inverse	negative number	A1.1.2.1.2	 Find values 	form the triangles.
symmetric with	Trigonometric	reflects the graph.)	Use and/or identify an	of trigonometric	Option 2
respect to the line	Functions	How are inverses of	algebraic property to	functions by using	Approaching
y = x; the domain		trigonometric	justify any step in an	reference angles	Level: Working in
of an inverse		functions similar to	equation solving process	• 12.4: Find the area	groups of three or
trigonometric		inverses of other	(linear equations only).	of a triangle using	four, students
function must be		functions you have		two sides and an	draw a variety of
restricted in order		studied? (Sample	A1.1.2.1.3	included angle	right triangles,
to be a function.		answer: The	Interpret solutions to	 Use the Law of 	each having one
		composition of a	problems in the context	Sines to solve	angle that
		trigonometric	of the problem situation	triangles	measures 30°.
		function and its	(linear equations only).	 Extend 12.4: 	Have students
		inverse is the		Investigate	measure the
		identity function; the	A1.1.2.2.1	measures in regular	lengths of the
		graphs are	Write and/or solve a	polygons using	hypotenuse and
		symmetric with	system of linear	trigonometry	the leg opposite
		respect to the line y	equations (including	 12.5: Use the Law 	the 30° angle to
		= x; the domain of	problem situations) using	of Cosines to solve	the nearest
		an inverse	graphing, substitution	triangles	millimeter. Then
		trigonometric	and/or elimination (limit	 Choose methods to 	ask students to
		function must be	systems to 2 linear	solve triangles	find the sine of 30°
		restricted in order to	equations).	 12.6: Find values 	in each triangle to
		be a function.)		of trigonometric	determine that sin
			A1.1.2.2.2	functions based on	30° is the same for
			Interpret solutions to	the unit circle	each triangle, 0.5.
			problems in the context	 Use the properties 	Discuss results
			of the problem situation	of periodic functions	with students.
			(systems of 2 linear	to evaluate	Then draw a right
			equations only).	trigonometric	triangle with a 30°
				functions	angle on the
			A1.1.3.1.1	 12.7: Describe and 	board. Label the
			Write or solve compound	graph the sine,	hypotenuse 8 cm.
			inequalities and/or graph	cosine, and tangent	Ask students how
			their solution sets on a	functions	they could find the
			number line (may include	 Describe and graph 	length of the leg
			absolute value	other trigonometric	opposite the 30°
			inequalities).	functions	angle.
				Explore 12.8: Use a	Option 3 English
			A1.1.3.1.2	graphing calculator	Learners: Working
			Identify or graph the	to explore	in groups of three
			solution set to a linear	transformations of	or four, students
			inequality on a number	the graphs	draw a variety of
			line.	of trigonometric	right triangles,
				functions	each having one
			A1.1.3.1.3	 12.8: Graph 	angle that
			Interpret solutions to	horizontal	measures 30°.
			problems in the context	translations of	Have students
			of the problem situation	trigonometric	measure the
			(limit to linear	graphs and find	lengths of the
			inequalities).	g. aprio ana ina	

 - <u></u>			
	A1.1.3.2.1	phase shiftsGraph vertical	hypotenuse and the leg opposite
	Write and/or solve a	translations of	the 30° angle to
	system of linear		the nearest
	inequalities using	trigonometric	millimeter. Then
	graphing (limit systems	graphs	ask students to
	to 2 linear inequalities).	• 12.9: Find values of	find the sine of 30°
	to 2 linear mequalities).	inverse	
	A1.1.3.2.2	trigonometric	in each triangle to
	-	functions	determine that sin 30° is the same for
	Interpret solutions to	 Solve equations by 	
	problems in the context	using inverse	each triangle, 0.5.
	of the problem situation	trigonometric	Discuss results
	(systems of 2 linear	functions	with students.
	inequalities only).		Then draw a right
	44.0.4.4.4		triangle with a 30°
	A1.2.1.1.1		angle on the
	Analyze a set of data for		board. Label the
	the existence of a		hypotenuse 8 cm.
	pattern and represent		Ask students how
	the pattern algebraically		they could find the
	and/or graphically.		length of the leg
			opposite the 30°
	A1.2.1.1.2		angle.
	Determine if a relation is		Option 4 Beyond
	a function given a set of		Level: Tell
	points or a graph.		students that you
	44.0.4.4.0		want them to draw
	A1.2.1.1.3		a triangle and
	Identify the domain or		determine its area
	range of a relation (may		using each of the
	be presented as ordered		following three
	pairs, a graph, or a		different ways:
	table).		using the basic
	A10101		formula for the
	A1.2.1.2.1		area of a
	Create, interpret and/or		triangle
	use the equation, graph or table of a linear		A _ ¹ bb
			$A = \frac{-}{2}bh$
	function.		The
	A1.2.1.2.2		lengths of the
	Translate from one		base and height
	representation of a linear		are needed.
	function to another		 using Heron's
	(graph, table and		formula The
	equation).		lengths of all
			three sides are
	A1.2.2.1.1		needed.
	Identify, describe and/or		
	use constant rates of		• using the
	change.		formula

A1.2.2.1.2	. 1
Apply the concept of	$A = \frac{1}{2}bc \sin A$
linear rate of change	2
(slope) to solve	
problems.	The lengths of
	two sides and
A1.2.2.1.3	the sine of their
	included angle
Write or identify a linear	are needed.
equation when given the	Students may use
graph of the line 2 points	a protractor and a
on the line, or the slope	ruler as needed.
and a point on a line,	Then have
(Linear equation may be	students tell what
in point-slope, standard	
and/or slope-intercept	information about
form).	the triangle they
	needed to know
A1.2.2.1.4	when using each
Determine the slope	method.
and/or y-intercept	 Visual/Spatial
represented by a linear	Learners Have
equation or graph.	students use a
oquation of graph.	stack of books and
A2.1.3.1.1	a notebook to
Write and/or solve	model a ramp and
	investigate how
quadratic equations	steep the ramp
(including factoring and	needs to be for a
using the Quadratic	toy car to roll down
Formula).	it without being
	pushed. Have
A2.1.3.1.2	
Solve equations	them report their
involving rational and/or	results in terms of
radical expressions (e.g.,	the trigonometric
10/(x + 3) + 12/(x - 2) =	functions of a right
1 or $\sqrt{(x^2 + 21x)} = 14$).	triangle.
	If students need
A2.1.3.1.3	further practice
Write and/or solve a	with coterminal
simple exponential or	angles, then have
logarithmic equation	them work with a
(including common and	partner so that one
natural logarithms).	person models an
hattira logantimoj.	angle with two
A2.1.3.1.4	pencils or
Write, solve and/or apply	yardsticks. The
linear or exponential	other partner then
	names a positive
growth or decay	and negative
(including problem	angle, less than or
situations).	more than a full
	circle, that are
A2.1.3.2.1	

Determine how a change each coterminal with the modeled angle. each coterminal with the modeled angle. Image in a second variable (a, y, v=i/v, fix double, with happens to y?). extension There angle. A2.1.3.2.2 Have students with a given angle. A2.1.1.1 angles cortical gives the angle solve d = flot 0, . A2.2.1.1 angles cortical gives the angle Analyze a set of data for the oxistence of a algebraically and/or graphically. august set students work in angles. A2.2.1.1.2 students work in angles. A2.2.1.1.2 students work in angles. A2.2.1.2 Have students water is a given the domain. regeometric sequence (e.g., given a geometric sequence, find angles. A2.2.1.3 Learners Have students work in angles. A2.2.1.4 Hermine the trapper in the domain. regeometric sequence, find angles. A2.2.1.3 Learners Have students with add the 20th termine the draactaristics of a angles. A2.2.1.1 Auge students A2.2.1.1 thermine the draactaristics of a angles. A2.2.1.1 thermine the draactaristics of a angles. A2.2.1.1 theremetric sequench, find angles.		
a change in a second and a second are infinitely many angles coterminal with a given angle. Very 7). A2.1.3.2.7 A2.1.3.2.7 A2.1.3.2.7 A2.1.3.2.7 A2.1.3.2.7 A2.1.3.2.7 A2.1.3.2.7 A2.2.1.1 A3.2.7.1.1 A3.2.7.1.1 A3.2.7.1.1 A4.2.1.1.1 A4.2.1.1.1 A4.2.1.1.1 A4.2.1.1.1 A4.2.1.1.1 A4.2.1.1.1 A4.2.1.1.2 A2.2.1.1.2 Cote at a for f). A2.2.1.1.2 Cote at a for f). A2.2.1.1.2 Cote at a for f). A2.2.1.1.2 Cote at a for f). A2.2.1.1.2 Cote at a for f). A3.2.1.1.2 Cote at a for f). A4.2.1.1.2 Cote at a for f). A2.2.1.1.2 Cote at a for f). A4.2.1.1.2 Cote at a for f). A4.2.1.1.2 Cote at a for f). A2.2.1.1.2 Cote at a for f). A1.2.1.1.3 Cote at a for f). A2.2.1.1.4 Cote at a for f). A3.2.1.1.4 Cote at a for f). A4.2.2.1.1.4 Cote at a for f). A4.2.1.1.4 Cote at a for f). A4.2.1.1.4 Cote at a for f). A4.2.1.1.4 Cote at a for f). A4.2.1.1.4 Cote at a for f).	Determine how a change	each coterminal
 variable (e.g., y=4%, if X exination There dobles, what happens to y7). A2.1.3.2.2 Use algebraic processes to solve a formula for a gene variable (e.g., gover variable (e.g., gover variable (e.g., gover be angle able d = n to r). A2.2.1.1 Analyze a set of data for 50°; 50° + k. angles cotterminal any integer. aptern and represent angle of the angle applie or the applie or the angle applie or the applie or the applie or the angle applie or the applie or the app		with the modeled
doubles, what happens to Y?). are infinitely many angles coterminal with a given angle. A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = n tro n, angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles co	a change in a second	angle.
doubles, what happens to Y?). are infinitely many angles coterminal with a given angle. A2.1.3.2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve d = n tro n, angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles coterminal given variable (e.g., solve d = n tro n, angles coterminal angles co	variable (e.g., y=4/x, if x	Extension There
it o y?). angles coteminal A2:13:2.2 Use algebraic processes to solve a formula for a given variable (e.g., solve al ent to r). with a given angle. A2:2.1:1 agiven variable (e.g., solve al ent to r). messure of all messure of al		are infinitely many
A2.1.3.2.2 With a given angle. Use algebraic processes witke an is solve a formula for a expression that given variable (e.g., gives the angle A2.2.1.1 angles coleminal A.Aalyza a set of data for SD ⁺ 4. A.Aalyza a set of data for SD ⁺ 5. pattern and represent SD ⁺ 5. pattern and represent SD ⁺ 5. in algebraically, and/or Learners Have algebraically, and/or stations, with an geometric sequence, find song, rap, or short pattern and regeometric remember the transport transport A2.2.1.1.2 create a jingle, identity and/or sequence, find pattern and regeometric remember the sequence (e.g., given a transport angles, and transport sequence find satubatis withe autor the zon term. satubatis with autor A2.2.1.1.3 timerpersonal Learners Have satubatis with autor sequence for an remember the rangles, and the domain, ral		
A21.3.2.2 Have sludents Use algebraic processes to solve a formula for a given variable (e.g., solve d = rt for r). expression that gives the angle measure of all angles coerminal with an angle of A1.2.2.1.1.1 A2.2.1.1.1 A1.2.2.1.1 with an angle of Analyze a set of data for the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. A.4.10.7.10000000000000000000000000000000		
Use algebraic processes to solve a formula for a given variable (e.g., solve d = nt for f).write an expression that gives the angle measure of all angles coterninal with a nagle of the existence of a a graphically.A2.2.1.1 Analyze a set of data for the existence of a agraphically.S0° + K - the existence of a a graphically.A2.2.1.1.2 Identically and/or graphically.Auditory/Musical Learners Have students work in small groups to create a ingle, create a ingle, distribution of the pattern with a rule algebraically and/or graphically.A2.2.1.1.2 Identically and/or extend a sequence (e.g., given a graphically.song, rap, or short remember the remember the sequence (e.g., given a graphically.A2.2.1.1.3 Identify and/or extend a arithmetic or geometric geometric sequence, find the 20th term).or short remember the students work in small groups to create a ingle, student work a song, rap, or short remember the sequence (e.g., given a geometric sequence, find the 20th term).A2.2.1.1.4 Identify and/or datermine the characteristics of a relation.Intrapersonal students worte a intercest a students worte a students worte a intercest a students worte a intercest a sequence (e.g., intervals of increasing/deremaing, intercests, zeros, and asymptotes).Intrape angle sequence (e.g., intervals of increasing/deremaing, intercests, zeros, and asymptotes).A2.2.1.1 Identify and/or datermine the characteristics of an expression fare the characteristics of a the characteristics of a the student for the student for the student for the student for the student for th	A2.1.3.2.2	
Image: Solve d = ft for h, give virable (e.g., gives virable (e.g., gives virable (e.g., gives virable (e.g., solve d = ft for h,expression that gives virable (e.g., gives virable (e.g., gives virable (e.g., the existence of a pattern and represent algebraicily and/or graphically.expression that gives virable (e.g., the existence of a the existence of a the pattern with a rule algebraicily and/or graphically.expression that gives virable (e.g., there k is any integer.A2.2.1.12 (dentify and/or extend a pattern an either an arithmetic or geometric sequence (e.g., given a trigonometric geometric sequence, find the 20th term).A2.2.1.1.2 create a jingle, tidont or special angles.A2.2.1.1.3 Determine the domain, rrange or inverse of a relation.Learmers Have students write a angles.A2.2.1.1.4 (dentify and/or extend a geometric sequence, find the 20th term).Intrapersonal Learmers Have students write a angles.A2.2.1.1.4 (dentify and/or determine the characteristics of an relation.Learmers Have students write a angles.A2.2.1.1.4 (dentify and/or determine the characteristics of an relation.Learmers Have students write a angles.A2.2.1.1.4 (dentify and/or determine the characteristics of an exponential, quadratic, or oplynomial function (e.g., intervals of leason.Extension Have students compute the area of a 3-4-5 ipht triangle site of asymptotes).A2.2.2.1.1 (reate, interpot and/or use the equation, graph use the equation, graph use the equation, graph use the formula for ipht triangle site of presented in this leason. <t< td=""><td></td><td></td></t<>		
given variable (e.g., solved e1 for f). gives the angle measure of all angles coterminal with an angle of solved e1 for f). A.2.2.1.1 A.2.2.1.1 Analyze a set of data for the existence of a pattern and represent all gebraically and/or graphically. Sol ⁰ , there k is a solved e1 all gebraically and/or graphically. A.2.2.1.1.2 Learners Have students work in small groups to create a ingle, leftently and/or settent a pattern as either an arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). Sol ⁰ , there k is a solved a song, rap, or short poem to help them arithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). Intrapersonal Learners Have students write a intrapersonal Learners Have students write a geometric sequence, find the 20th term). A.2.2.1.1.3 Determine the domain, range or inverse of a relation. Intrapersonal Learners Have students write a incurse students write a students write a source of a which example they hought and why, Ask the are along and why, Ask the are along are		
solve d = rt for i). measure of all angles coteminal with an angle of 50°, 50° + K - the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. with an angle of 50°, 50° + K - 360°, where k is any integer. A.2.2.1.12 - Auditory/Musical algebraically and/or graphically. - Auditory/Musical algebraically and/or graphically. A.2.2.1.12 create a ingle, tidentify and/or extend a pattern as either an arithmetic or geometric remember the sequence (e.g., given a geometric sequence, find the 20th term). song, rap, or short pattern as either an angles. A.2.2.1.13 thapersonal Learners Have Learners Have subject or special angles. A.2.2.1.14 tidentify and/or determine the domain, range or inverse of a relation. Intrapersonal Learners Have values for special angles. A.2.2.1.14 thermines of a relation. - Intrapersonal Learners Have subject or special angles. A.2.2.1.14 most challenging iournal entry about which example - Intrapersonal Learners Have subject or spolynomial function increasing/decreasing, intercepts, zeros, and asymptotes). A.2.2.2.1.1 most challenging and why, Ask - Examion Have students compute the ara of a 3-4-5 right triangle using intercepts, zeros, and asymptotes). A.2.2.2.1.1 the ara of a 3-4-5 right triangle using intercepts, zeros, and asymptotes). - Examion Have students compute the ara of a 3-4-5 right triangle using intercept areas).		
A2.2.1.1 analyze a set of data for the existence of a pattern and represent algebraically and/or graphically. any integer. A2.2.1.1 with a rule algebraically and/or graphically. any integer. A2.2.1.2 students work in students work in graphically. students work in students a either an pattern as either an arithmetic or geometric geometric sequence, find angles. students work in song. go, or short pattern as either an potern to help them angles. A2.2.1.1.3 intrapersonal Learners Have intrapersonal Learners Have A2.2.1.1.4 intrapersonal Learners Have A2.2.1.1.3 intrapersonal Learners Have Determine the domain, range or inverse of a relation. students write a journal entry about which example A2.2.1.1.4 most challenging and why. Ask the e angle addraic, or polynomial function (e.g., intervals of a symptotes). intrapersonal Learners Have students compute students compute students, and and why. Ask the area of a 3-4-5 right triangle using intercepts, zeros, and asymptotes). A2.2.2.1.1 the area formula create, interpret and/or use the equation, graph or table of a polynomial uncertain function (including quadraitics). Extension Have students compute students compute students of a students or at the area formula create, interpret and/or use the equation, graph or table of a polynomial threation (including quadraitics).<		
A2.2.1.1 with an angle of Analyze a set of data for 50°: 50° + K · the existence of a 360°, where k is apatern and represent any integer. the pattern with a rule • Auditory/Musical algebraically and/or students work in graphically. students work in A2.2.1.1.2 create a jingle. A2.2.1.1.2 create a jingle. Identify and/or extend a song, rap, or short pattern with as either an poem the arithmetic or geometric sequence, find sequence, find values for special arithmetic or geometric students withe a geometric sequence, find students withe a range or inverse of a journal entry about relation. which example A2.2.1.4 most challenging Identify and/or determine any questions they or polynomial function students withe a relation. students of a (e.g., interporals of the most challenging identify and/or determine any questions they or polynomial function students ormula	301VC ú = 11101 1).	
Analyze as et of data for the existence of a pattern and represent apattern with a rule algebraically and/or graphically. 50°: 50° + K· Auditory/Musical algebraically and/or graphically. - Auditory/Musical Learners Have students work in small groups to create a jingle, ocreate a jingle, and which example the characteristics of an exponential, quidratic, or polynomial function (e.g., intervals of increasing/decreasing, intercepts, zeros, and asymptotes). - Nitrapersonal Learners Have students write a journal entry about which example they found the most challenging and why. Ask the area of a 3-4-5 right tiangle using the area of a 3-4-5 right tiangle using the area for inger sent adv/or use the equation, graph or table of a polynomial function (including quadratics). - Kethesion Have students write a students compute the area of a students compute the area of a students compute the area of a students compute the area of a students compute the secon. Have them use the formula for the triangle, 6; 6; 6	A22111	
the existence of a pattern and represent the pattern with a rule algebraically and/or graphically. 360°, where k is any integer. algebraically and/or graphically. Auditory/Musical Learners Have students work in small groups to create a jingle, students work in small groups to create a jingle, students work in sequence (e.g., given a geometric sequence, find the 20th term). angles. A2.2.1.1.2 create a jingle, the domain, rangles. trigonometric sequence, find the 20th term). angles. A2.2.1.1.3 create a jingle, the domain, rangles or inverse of a relation. total terms. angles. A2.2.1.1.4 creates angle, the domain, rangles or inverse of a relation. total terms. angles. A2.2.1.1.4 creates angle, the domain, rangle or inverse of a relation. total terms. angles. A2.2.1.1.4 creates angle, the domain, rangle or inverse of a relation. total terms. total terms. A2.2.1.1.4 teenrest Have students write a journal entry about the techaracteristics of an exponential, quadratic, any value store they found the most challenging and why. Ask the techaracteristics of an exponential, quadratic, any value store, and asymptotes). Extension Have students compute the area of a 3-4-5 right triangle using the area of a 3-4-5 right triangle using the area of a 3-4-5 right terms and the area formula presented in this use the formula for rate in (notion (including quadratics)). the terms and a-5 right teremula for tany or tabit of a polynomial in the area formula prese		
pattern and represent the pattern with unlead algebraically and/or graphically. any integer. any integer. Audiory/Musical Learners Have students work in smail groups to create a jingle, identify and/or extend a pattern as either an an ithmetic or geometric sequence (e.g., given a geometric sequence, find the 20th term). or create a jingle, song, rap, or short pettern as either an an eithmetic or geometric sequence, find the 20th term). or create a jingle, song, rap, or short pettern as either an an eithmetic or geometric sequence, find the 20th term). or create a jingle, song, rap, or short pettern as either an an eithmetic sequence, find the 20th term). or the pettern trigonometric angles. A2.2.1.1.4 (dentify and/or determine the characteristics of an exponential, quadratic, or polynomial function increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/decreasing, increasing/d		
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or table of a polynomial function (including quadratics).		
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quadratics). the triangle. 6; 6; 6		
If students		
If students	quadratics).	the triangle. 6; 6; 6
A2.2.2.1.2		If students
	A2.2.2.1.2	

Create, interpret and/or	struggle with any
use the equation, graph	of the methods
or table of an	shown to solve a
exponential or	triangle, then have
logarithmic function	students discuss
(including common and	in small groups
natural logarithms).	how to choose
	which method to
A2.2.2.1.3	use when solving
Determine, use and/or	a triangle. Have
interpret minimum and	them compare
maximum values over a	their approaches
specified interval of a	and develop a
graph of a polynomial,	brief explanation
exponential or	to help others
logarithmic function.	decide. Then have
	each group share
A2.2.2.1.4	their conclusions
Translate a polynomial,	with the class.
exponential or	Extension Have
logarithmic function from	students use the
one representation to	Law of Cosines to
another (graph, table	attempt to solve a
and equation).	"triangle" with
	sides 5, 12, and
A2.2.2.2.1	18 (such a triangle
Identify or describe the	does not exist).
effect of changing	Have them explain
parameters within a	what they discover
family of functions (e.g.,	and what it means.
$y = x^2$ and $y = x^2 + 3$, or	Students will get
$y = x^2$ and $y = 3x^2$.	an error when
$y = \lambda z$ and $y = 0\lambda z y$.	attempting to find
CC.2.2.HS.C.2	the inverse cosine
Graph and analyze	because the value
functions and use their	is not between –1
properties to make	and 1. This means
connections between the	that no such
different representations.	triangle exists.
	Naturalist
CC.2.2.HS.C.4	Learners Have
Interpret the effects	students research
transformations have on	
functions and find the	various kinds of
inverses of functions.	circular calendars,
	such as those
CC.2.2.HS.D.10	used by the Maya,
Represent, solve and	to predict the
	weather and
interpret equations/inequalities	determine the best
	time for planting
and systems of	crops.
equations/inequalities	

	 		 •	
		algebraically and	 Visual/Spatial 	
		graphically.	Learners Have	
			groups of students	
		CC.2.2.HS.D.6	make posters	
		Extend the knowledge of	showing sketches	
		rational functions to	of the graphs of	
		rewrite in equivalent	the six	
		forms.	trigonometric	
			functions.	
		CC.2.2.HS.D.7	Encourage	
		Create and graph	students to color-	
		equations or inequalities	code the key	
		to describe numbers or	features of all the	
		relationships.		
		relationenipe.	graphs, such as	
			period, amplitude,	
		CC.2.2.HS.D.8	asymptotes, and	
		Apply inverse operations	so on.	
		to solve equations or	 If students 	
		formulas for a given	struggle with	
		variable.	translations of	
			trigonometric	
			graphs, then make	
			coordinate axes	
			with masking tape	
			on the classroom	
			floor. Give	
			students at least	
			15 feet of rope and	
			have them stand	
			along the x-axis,	
			positioning the	
			rope to model the	
			graph of $y = \sin x$.	
			As you call out	
			equations of functions with	
			graphs being	
			horizontal phase	
			shifts of the graph	
			of $y = \sin x$,	
			students can step	
			left or right to	
			model the	
			translated graph.	
			Similarly, call out	
			functions with	
			graphs being	
			vertical shifts of	
			the graph y = sin	
			x.	
			 Visual/Spatial 	
L				

	Learners Ask students to find Arcsin 2. If they use a calculator, suggest that they study the graph of y= sin x to explain why an error message was the result. The graph of y = sin x has no y-values greater than 1 or less than