

Algebra 1 Pacing Guide

2022-2023

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

First Nine Weeks

Sep 2022				
M	T	W	T	F
5	6	7	8	9
12	13	14	15	16
19	20	21	22	23
26	27	28	29	30

Oct 2022				
M	T	W	T	F
3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28
31				

Nov 2022				
M	T	W	T	F
	1	2	3	4
7	8	9	10	11
14	15	16	17	18
21	22	23	24	25
28	29	30		

Pre-Assessment
Holiday

Checkpoint Assessment
Teacher Workday

Benchmark Assessment
End of Nine Weeks

Units	Topics	Standards of Learning	# of Days	Dates
UNIT #1	Course Overview	All Algebra 1 Standards	1	September 6, 2022
	Pre-Assessment		3	September 7-9, 2022
	Verbal Expressions and Expressions Representation	A.1 ab	4	September 8-9, 12-13, 2022
	Solving One Variable Equations and Literal Equations	A.4 ac	4	September 14-16, 20, 2022
	Teacher Workday		1	September 19, 2022
	Multistep Inequality Applications of Multistep Inequalities	A.5 ac	4	September 21-23, 26, 2022
	Graphs of Linear Equations	A.6 abc	4	September 27-30, 2022
	Systems of Equations	A.4 de	5	October 3, 5-7, 10, 2022
	Checkpoint Assessment		4	October 4-7, 2022

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	Linear Inequalities and Systems of Linear Inequalities	A.5 bd	4	October 11-14, 2022
	Teacher Workday		1	October 17, 2022
	Direct and Inverse Variations	A.8	6	October 18-21, 24-25, 2022
	Laws of Exponents, Polynomials, and Factoring	A.2 abc	10	October 26-28, 31, November 1-4, 9-10
	Benchmark Assessment		3	November 7, 9, 10, 2022
	Teacher Workday		1	November 8, 2022
SOL #	Topic	Essential Knowledge, Skills, and Understanding		
A. 1 ab	Verbal Expressions and Expressions Representation	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to - Translate between verbal quantitative situations and algebraic expressions and equations. (1a) - Represent practical situations with algebraic expressions in a variety of representations (e.g., concrete, pictorial, symbolic, verbal). (1a) - Evaluate algebraic expressions, using the order of operations, which include absolute value, square roots, and cube roots for given replacement values to include rational numbers, without rationalizing the denominator. (1b)		
Instructional Days	The students will			
4	a. represent verbal quantitative situations algebraically; and b. evaluate algebraic expressions for given replacement values of the variables.			
Essential Vocabulary		Essential Questions		
Bolded words are listed in the VDOE Word Wall Cards (<u>Word</u>) / (<u>PDF</u>) Expression, variable, evaluate, real numbers, term, coefficient, order of operations, absolute value, square root, cube root, equation, translate, simplest form, perfect cube, integer, radical, radicand, perfect square		- Why do we use variables in algebra? - What is the difference between an expression and an equation? - When is it helpful to translate between verbal quantitative situations and algebraic expressions and equations?		

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- How can you represent practical situations with algebraic expressions in a variety of ways? - How is finding the square root of a whole number different from finding the square root of an algebraic expression? How are they the same? - What is the relationship between perfect squares and square roots? Perfect cubes and cube roots?		
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology <u>Evaluating Expressions</u> (Desmos) Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL A.1a</u> (Word) / <u>PDF</u> / <u>Desmos</u> <u>SOL A.1b</u> (Word) / <u>PDF</u> / <u>Desmos</u> <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests that correspond to A.1. https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-1ab-translate-eval.pdf		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
4 ac	One Variable Equations and Literal Equations	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to - Determine whether a linear equation in one variable has one, an infinite number, or no solutions. (4a) - Apply the properties of real numbers and properties of equality to simplify expressions and solve equations. (4a) - Solve multistep linear equations in one variable algebraically. (4a)
Instructional Days	The students will solve	
4	a. multistep linear equations in one variable algebraically; and c. literal equations for a specified variable.	

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		Solve a literal equation for a specified variable. (4c)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) literal equation, solution, linear, multi-step equation, infinite, simplify, set notation, rational, irrational, ordered pair, properties of equality		- How can you determine whether a linear equation has one, an infinite number, or no solution? - Why is it important to understand the properties of real numbers and properties of equality? - When would you want to solve a literal equation for a specified variable?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Flippity Scavenger Hunt Activity - Students will complete a self - check activity solving multi step problems Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources SOL A.4a (Word) / PDF / Desmos Just in Time Quick Check SOL A.4c (Word) / PDF / Desmos Just in Time Quick Check <u>SOL Released Items:</u> These items are from the 2014 and 2015 released tests and correspond to A.4a. <u>SOL Released Items:</u> These items are from the 2014 and 2015 released tests and correspond to A.4c. https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-4ae-prog-equations.pdf https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-4c-lit-eq-formulas.pdf		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.5ac		

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Instructional Days	Modeling and Solving Multistep Inequality	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to
4	Applications of Multistep Inequalities The students will solve a. multistep linear inequalities in one variable algebraically and represent the solution graphically; and c. practical problems involving inequalities.	- Solve multistep linear inequalities in one variable algebraically and represent the solution graphically. (5a) - Apply the properties of real numbers and properties of inequality to solve multistep linear inequalities in one variable algebraically. (5a) - Solve practical problems involving linear inequalities. (5c) - Determine whether a coordinate pair is a solution of a linear inequality or a system of linear inequalities. (5c)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Inequality, solution, graph of inequality, transitive property of inequality, addition property of inequality, subtraction property of inequality, multiplication property of inequality, division property of inequality, bounded, half-plane, commutative property of addition/multiplication, identity property of addition/multiplication, inverse property of addition/multiplication		- How is solving a multistep linear inequality the same as solving a multistep linear equation? How is it different? - Why is it important to represent the solutions to a multistep linear inequality on a number line? - How can understanding the properties of real numbers and properties of inequality help when solving a multistep linear inequality? - What does the solution of a linear inequality represent? - How can using a graphing utility help you to understand solving and representing inequalities?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic		

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Textbook/Worksheets/Other Resources

envision Algebra 1

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.5a

SOL A.5a (Word) / PDF / Desmos Just in Time Quick Check

SOL A.5c (Word) / PDF / Desmos (Questions #1 and #2) Just in Time Quick Check

https://www.doe.virginia.gov/instruction/mathematics/middle/algebra_readiness/formative-assess/pfa/fa-1a-5ac.pdf

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5a-sol-ineq-one-var.pdf

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5ac-lemonade-ineq.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.6abc	Slope, Equations, and Graph of a Line The student will	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to
Instructional Days	a. determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line;	
4	b. write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line; and c. graph linear equations in two variables.	- Determine the slope of the line, given the equation of a linear function. (6a) - Determine the slope of a line, given the coordinates of two points on the line. (6a) - Determine the slope of a line, given the graph of a line. (6a) - Recognize and describe a line with a slope or rate of change that is positive, negative, zero, or undefined. (6a) - Write the equation of a line when given the graph of a line. (6b) - Write the equation of a line when given two points on the line whose coordinates are integers. (6b) - Write the equation of a line when given the slope and a point on the line whose coordinates are integers. (6b) - Write the equation of a vertical line as $x = a$. (6b) - Write the equation of a horizontal line as $y = c$. (6b)

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		- Write the equation of a line parallel or perpendicular to a given line through a given point. (6b) - Graph a linear equation in two variables, including those that arise from a variety of practical situations. (6c) - Use the parent function $y = x$ and describe transformations defined by changes in the slope or y-intercept. (6c)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Slope, slope formula, slopes of lines, vertical line, horizontal line, parent function, translation, reflection, dilation, standard form, slope intercept form, point-slope form, equivalent forms of linear function, perpendicular lines, parallel lines, point, linear equation, linear function, graph, rate of change, positive slope, negative slope, zero slope, undefined slope		- What does it mean if a line that has a slope that is positive, negative, zero, or undefined? - How do you determine the best method to use when writing the equation of a line? - What is the relationship between the slopes of parallel lines? - What is the relationship between the slopes of perpendicular lines? - How can you write the equation of a line parallel or perpendicular to a given line through a given point? - How can you graph a linear equation? - How do you describe transformation of linear equation based on the parent function $y=x$?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.6ab. <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.6bc. <u>SOL A.6a</u> (Word) / PDF / Desmos Just in Time Quick Check		

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

[SOL A.6b \(Word\)](#) / [PDF](#) / [Desmos](#) Just in Time Quick Check

[SOL A.6c \(Word\)](#) / [PDF](#) / [Desmos](#) Just in Time Quick Check

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-6abc-slope2sl-desmos.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.4 de	Systems of Equations The students will solve	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Given a system of two linear equations in two variables, that has a unique solution, solve the system by substitution or elimination to identify the ordered pair, which satisfies both equations. (4d) - Given a system of two linear equations in two variables that has a unique solution, solve the system graphically by identifying the point of intersection. (4d) - Solve and confirm algebraic solutions to a system of two linear equations using a graphing utility. (4d) - Determine whether a system of two linear equations has one, an infinite number, or no solutions. (4d) - Write a system of two linear equations that models a practical situation. (4e) - Interpret and determine the reasonableness of the algebraic or graphical solution of a system of two linear equations that models a practical situation. (4e) - Solve practical problems involving equations and systems of equations. (4e)
Instructional Days	d. systems of two linear equations in two variables algebraically and graphically; and	
5	e. practical problems involving equations and systems equations.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Systems of linear equations (substitution), system of linear equations (elimination), system of linear equations (graphing), systems of linear equations (number of solutions), parallel lines, system of linear equations, coinciding, point of intersection		- How is the graph of a system of equations related to its solution? - What does it mean if a system of two linear equations has one solution? An infinite number of solutions? No solutions? - How can you determine the most efficient method for solving a system of linear equations? - Why is it important to interpret the solution to a system of equations?

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

		- How can you determine if the solution to a system of two linear equations is reasonable for a practical situation? Why is this important? - How can a system of equations be used to solve a practical problem?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL Released Items</u> : These items are from the 2014 and 2015 released tests and correspond to A.4e, which is covered in Systems of Equations and Inequalities. <u>SOL A.4d</u> (Word) / <u>PDF</u> / <u>Desmos</u> Just in Time Quick Check <u>SOL A.4e</u> (Word) / <u>PDF</u> / <u>Desmos</u> Just in Time Quick Check https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-4de-road-trip-solv-sys.pdf		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.5 bd	Linear Inequalities and Systems of Linear Inequalities	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Represent the solution of a linear inequality in two variables graphically. (5b) - Solve practical problems involving linear inequalities. (5c) - Determine whether a coordinate pair is a solution of a linear inequality or a system of linear inequalities. (5c) - Represent the solution of a system of two linear inequalities graphically. (5d)
Instructional Days	The students will	
4	b. represent the solution of linear inequalities in two variables graphically; and d. represent the solution to a system of inequalities graphically.	

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		Determine and verify algebraic solutions using a graphing utility. (5a, b, c, d)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Inequality, solution, graph of inequality, transitive property of inequality, addition property of inequality, subtraction property of inequality, multiplication property of inequality, division property of inequality, bounded, half-plane, commutative property of addition/multiplication, identity property of addition/multiplication, inverse property of addition/multiplication		- How is solving a multistep linear inequality the same as solving a multistep linear equation? How is it different? - How is the graph of a linear inequality in two variables similar to the graph of a linear equation in two variables? How are they different? - What does the solution of a linear inequality represent? - What does the solution of a system of linear inequalities represent? - How can using a graphing utility help you to understand solving and representing inequalities?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.5bcd. SOL A.5b (Word) / PDF / Desmos Just in Time Quick Check SOL A.5c (Word) / PDF / Desmos Just in Time Quick Check SOL A.5d (Word) / PDF / Desmos Just in Time Quick Check https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5b-ineq-2-var-desmos.pdf		

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5d-sys-lin-ineq-desmos.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.8	Direct and Inverse Variation	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Given a data set or practical situation, determine whether a direct variation exists. (8) - Given a data set or practical situation, determine whether an inverse variation exists. (8) - Given a data set or practical situation, write an equation for a direct variation. (8) - Given a data set or practical situation, write an equation for an inverse variation. (8) - Given a data set or practical situation, graph an equation representing a direct variation. (8)
Instructional Days	The student, given a data set or practical situation, will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically.	
6		
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Direct variation, inverse variation, independent variable, dependent variable, variation, constant of variation, directly proportional, constant of proportionality		- How can you determine whether a direct variation exists in a data set or practical situation? - How can you determine whether an inverse variation exists in a data set or practical situation? - What is the difference between direct and inverse variation? - How do you write an equation for a direct variation situation? - How do you write an equation for an inverse variation situation? - How do you graph an equation representing a direct variation?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra		

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

Technology

Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic

VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.8

SOL A.8 (Word) / PDF / Desmos

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-8-direct-variation.pdf

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-8-inverse-variation.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.2 abc	Laws of Exponents, Polynomials and Factoring	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Simplify monomial expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents. (2a) - Model sums, differences, products, and quotients of polynomials with concrete objects and their related pictorial and symbolic representations. (2b) - Determine sums and differences of polynomials. (2b) - Determine products of polynomials. The factors should be limited to five or fewer terms (i.e., $(4x + 2)(3x + 5)$ represents four terms and $(x + 1)(2x^2 + x + 3)$ represents five terms). (2b) - Determine the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor. (2b) - Factor completely first- and second-degree polynomials in one variable with integral coefficients. After factoring out the greatest common factor (GCF), leading coefficients should have no more than four factors. (2c) - Factor and verify algebraic factorizations of polynomials with a graphing utility. (2c)
Instructional Days	The student will perform operations on polynomials, including	
10	a. applying the laws of exponents to perform operations on expressions; b. adding, subtracting, multiplying, and dividing polynomials; and c. factoring completely first- and second-degree binomials and trinomials in one variable.	

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Essential Vocabulary	Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) exponential form, negative exponent, zero exponent, product of powers property, power of a product property, quotient of powers property, monomial, exponent, base, simplify, power, laws of exponents, ratios, binomial, trinomial, first-degree, second-degree, polynomial, factoring, difference of two squares, leading coefficient, greatest common factor, monomial divisor, prime polynomial, binomial divisor	• Why is it important to understand exponents? • How can I simplify expressions containing exponents? • Can two algebraic expressions that appear to be different be equivalent? • How can we use the polynomial operations in practical situations? • How is modeling operations of polynomials with concrete objects, pictures, and symbols useful? • What are some practical situations that would require operations with polynomials? • Why do we factor polynomials? • How is a difference of squares different from other polynomials? How is it the same? • What is the relationship between the factor(s) of a polynomial and the graph of the polynomial?
Resources/Technology	
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.2a. <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.2bc Just in Time Quick Checks SOL A.2a (Word) / PDF / Desmos SOL A.2b (Word) / PDF / Desmos Mathematics Instructional Plans A.2a - Laws of Exponents (Word) / PDF Version A.2b - Dividing Polynomials Using Algebra Tiles (Word) / PDF Version A.2b - Multiplying Polynomials Using Algebra Tiles (Word) / PDF Version	

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A.2b - Adding and Subtracting Polynomials Using Algebra Tiles (Word) / PDF Version

A.2c - Factoring Polynomials / PDF Version

Second Nine Weeks

Nov 2022				
M	T	W	T	F
	1	2	3	4
7	8	9	10	11
14	15	16	17	18
21	22	23	24	25
28	29	30		

Dec 2022				
M	T	W	T	F
			1	2
5	6	7	8	9
12	13	14	15	16
19	20	21	22	23
26	27	28	29	30

Jan 2023				
M	T	W	T	F
2	3	4	5	6
9	10	11	12	13
16	17	18	19	20
23	24	25	26	27
30	31			

Pre-Assessment
Holiday

Checkpoint Assessment
Teacher Workday

Benchmark Assessment
End of Nine Weeks

Units	Topics	Standards of Learning	# of Days	Dates
UNIT #2	Square Roots and Cube Roots	A.3 abc	4	November 14-17, 2022
	Functions and Relations	A.7 abcdef	8	November 18, 21-22, 28-30, and December 1-2, 2022
	Holiday		3	November 23-25, 2022
	Quadratic Equations	A.4b, A.7 cdf	5	December 5-9, 2022
	Checkpoint Assessment		5	December 12-16, 2022
	Holiday		10	December 19-30
	Line and Curve of Best Fit	A.9	5	January 2-6, 2023

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		Review for SOL/ Final Examination	All Standards of Learning	10	January 9-13, 17-20 and 23, 2023
		Holiday		1	January 16, 2022
		Review for SOL Retakes/Final Examination	All Standards of Learning	3	January 25-27, 30, 2023
SOL #	Topic		Essential Knowledge, Skills, and Understanding		
A.3.abc	Square Roots and Cube Roots		The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Express the square root of a whole number in simplest form. (3a) - Express the principal square root of a monomial algebraic expression in simplest form where variables are assumed to have positive values. (3a) - Express the cube root of an integer in simplest form. (3b) - Simplify a numerical expression containing square or cube roots. (3c) - Add, subtract, and multiply two monomial radical expressions limited to a numerical radicand. (3c)		
Instructional Days	The student will simplify				
4	a. square roots of whole numbers and monomial algebraic expressions; b. cube roots of integers; and c. numerical expressions containing square or cube roots.				
Essential Vocabulary			Essential Questions		
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Square root, cube root, product property of radicals, quotient property of radicals, radical, whole number, radicand, integer, numeric expression, simplest form, principal square root, radical expression, prime factorization, monomial, perfect square, perfect cube, factors, consecutive integers			- How is finding the square root of a whole number different from finding the square root of an algebraic expression? How are they the same? - What is the relationship between perfect squares and square roots? Perfect cubes and cube roots? - How does an understanding of combining like terms help when simplifying radical expressions? - How does understanding simplifying radicals help when simplifying radical expressions?		
Resources/Technology					

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Textbook/Worksheets/Other Resources

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Technology

Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic

VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.3.

Just in Time Quick Check

[SOL A.3a](#) (Word) / [PDF](#) / [Desmos](#)

[SOL A.3b](#) (Word) / [PDF](#) / [Desmos](#)

[SOL A.3c](#) (Word) / [PDF](#) / [Desmo](#)

Mathematics Instructional Plans

[A.3a - Simplifying Square Roots of Monomial Expressions](#) (Word) / [PDF Version](#)

[A.3b - Simplify Cube Roots of Integers](#) (Word) / [PDF Version](#)

[A.3c - Simplify Numerical Expressions with Square and Cube Roots](#) (Word) / [PDF Version](#)

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.7 abcdef	Relations and Functions	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Determine whether a relation, represented by a set of ordered pairs, a table, a mapping, or a graph is a function. (7a) - Identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically. (7bcd) - For any value, x, in the domain of f, determine $f(x)$. (7e) - Represent relations and functions using verbal descriptions, tables, equations, and graph. Given one representation, represent the relation in another form. (7f) - Investigate and analyze characteristics and multiple representations of functions with a graphing utility. (7abcdef)
Instructional Days	The student will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including	
8	a. determining whether a relation is a function; b. domain and range; c. zeros; d. intercepts; e. values of a function for elements in its domain; and f. connections between and among multiple representations of	

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	functions using verbal descriptions, tables, and graphs	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Linear, quadratic, functions, function notation, relation, domain, range, roof, zeros, x-intercepts, y-intercepts, set notation, tables, graphs, equations, dependent variables, input, output		• What makes a relation a function? • What are the different ways functions can be represented? • How can you determine whether a relation is a function when given a set of ordered pairs, a table, a mapping, or a graph? • How can you identify the domain and range of a function? • How can you identify the zeros of a function? • How can you identify the intercepts of a function? • How can you find $f(x)$ for a given value or set of given values of x? • How do you investigate characteristics of functions with a graphing utility?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, Problem attic VDOE Resources <u>SOL Released Items:</u> These items are from the 2014 and 2015 released tests and correspond to A.7 Just in Time Quick Checks SOL A.7a (Word) / PDF / Desmos SOL A.7b (Word) / PDF / Desmos SOL A.7c (Word) / PDF / Desmos SOL A.7d (Word) / PDF / Desmos SOL A.7e (Word) / PDF / Desmos SOL A.7f (Word) / PDF / Desmos		

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Mathematics Instructional Plans

[A.7abef - Functions 1: Investigating Relations and Functions \(Word\) / PDF Version](#)

[A.7aef- Square Patios \(Word\) / PDF Version](#)

[A.7bcd - Functions 2: Exploring Quadratic Functions \(Word\) / PDF Version](#)

[A.7cd - Quadratic Connections \(Word\) / PDF Version](#)

[A.7cd - Solving Linear Equations Using Functions with Desmos \(Word\) / PDF Version](#)

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.4.b and A.7.cdf	Quadratic Equations	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Solve quadratic equations in one variable algebraically. Solutions may be rational or irrational. (4b) - Identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically. (7c) - Use the x-intercepts from the graphical representation of a quadratic function to determine and confirm its factors. (7cd) - Represent relations and functions using verbal descriptions, tables, equations, and graph. Given one representation, represent the relation in another form. (7f) - Investigate and analyze characteristics and multiple representations of functions with a graphing utility. (7cdf)
Instructional Days	b. solve quadratic equations in one variable algebraically	
5	The students will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including: c. zeros; d. intercepts; and f. connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF)		- What methods can you use to solve a quadratic equation algebraically? - How can you identify the zeros of a function?

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5	best fit in order to make predictions, and solve practical problems, using mathematical models of linear and quadratic functions	data points in a table, a graph, or a practical situation. (9) • Make predictions, using data, scatterplots, or the equation of the curve of best fit. (9) • Solve practical problems involving an equation of the curve of best fit. (9) • Evaluate the reasonableness of a mathematical model of a practical situation. (9)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Curve of best fit, scatterplot, outlier data, linear functions, quadratic functions		• What is the process to determine an equation of a curve of best fit? • How do you make predictions using data, scatterplots, or the equation of the curve of best fit? • How can you solve practical problems involving an equation of the curve of best fit? • How can you evaluate the reasonableness of a curve of best fit for a practical situation?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources SOL A.9 (Word) / PDF / Desmos Just in Time Quick Check Mathematics Instructional Plans A.9 - Curve of Best Fit 1 with Desmos (Word) / PDF Version A.9 - Curve of Best Fit 2 (Word) / PDF Version		

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Third Nine Weeks

Feb 2023				
M	T	W	T	F
		1	2	3
6	7	8	9	10
13	14	15	16	17
20	21	22	23	24
27	28			

Mar 2023				
M	T	W	T	F
		1	2	3
6	7	8	9	10
13	14	15	16	17
20	21	22	23	24
27	28	29	30	31

Apr 2023				
M	T	W	T	F
3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28

Pre-Assessment
Holiday

Checkpoint Assessment
Teacher Workday

Benchmark Assessment
End of Nine Weeks

Units	Topics	Standards of Learning	# of Days	Dates
UNIT #3	Teacher Workday		1	February 3, 6-7, 2022
	Pre-Assessment		3	February 8-10, 2022
	Course Overview	All Algebra 1 Standards	1	February 8, 2023
	Verbal Expressions and Expressions Representation	A.1 ab	4	February 10, 13-15, 2023
	One Variable Equations and Literal Equations	A.4 ac	4	February 16-17, 20-21, 2023
	Multistep Inequality Applications of Multistep Inequalities	A.5 ac	4	February 22-24, 27, 2023
	Graphs of Linear Equations	A.6 abc	4	February 28, March 1-3, 2023
	Systems of Equations	A.4 de	5	March 6-9, 13 2023
	Checkpoint Assessment		4	March 7-10, 2022

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	Linear Inequalities and Solving Systems of Linear Inequalities	A.5 bd	4	March 14-17, 2023
	Direct and Inverse Variations	A.8	6	March 17, 21-24, 2023
	Teacher Workday		1	March 20, 2022
	Laws of Exponents, Polynomials, and Factoring	A.2 abc	9	March 27-31, April 3-6, 2023

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.1 ab	Translating Verbal Expressions and Representations	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to - Translate between verbal quantitative situations and algebraic expressions and equations. (1a) - Represent practical situations with algebraic expressions in a variety of representations (e.g., concrete, pictorial, symbolic, verbal). (1a) - Evaluate algebraic expressions, using the order of operations, which include absolute value, square roots, and cube roots for given replacement values to include rational numbers, without rationalizing the denominator. (1b)
Instructional Days	The students will	
4	a. represent verbal quantitative situations algebraically; and b. evaluate algebraic expressions for given replacement values of the variables.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Expression, variable, evaluate, real numbers, term, coefficient, order of operations, absolute value, square root, cube root, equation, translate, simplest form, perfect cube, integer, radical, radicand, perfect square		- Why do we use variables in algebra? - What is the difference between an expression and an equation? - When is it helpful to translate between verbal quantitative situations and algebraic expressions and equations? - How can you represent practical situations with algebraic expressions in a variety of ways?

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		- How is finding the square root of a whole number different from finding the square root of an algebraic expression? How are they the same? - What is the relationship between perfect squares and square roots? Perfect cubes and cube roots?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology <u>Evaluating Expressions</u> (Desmos) Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL A.1a</u> (Word) / <u>PDF</u> / <u>Desmos</u> <u>SOL A.1b</u> (Word) / <u>PDF</u> / <u>Desmos</u> <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests that correspond to A.1. https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-1ab-translate-eval.pdf		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
4 ac	One Variable Equations and Literal Equations	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to - Determine whether a linear equation in one variable has one, an infinite number, or no solutions. (a) - Apply the properties of real numbers and properties of equality to simplify expressions and solve equations. (a) - Solve multistep linear equations in one variable algebraically. (a) - Solve a literal equation for a specified variable. (c)
Instructional Days	The students will solve	
4	a. multistep linear equations in one variable algebraically; and c. literal equations for a specified variable.	
Essential Vocabulary		Essential Questions

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF)	• How can you determine whether a linear equation has one, an infinite number, or no solution? • Why is it important to understand the properties of real numbers and properties of equality? • When would you want to solve a literal equation for a specified variable?	
literal equation, solution, linear, multi-step equation, infinite, simplify, set notation, rational, irrational, ordered pair, properties of equality		
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1		
Technology Flippity Scavenger Hunt Activity - Students will complete a self - check activity solving multi step problems Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube		
VDOE Resources SOL A.4a (Word) / PDF / Desmos Just in Time Quick Check SOL A.4c (Word) / PDF / Desmos Just in Time Quick Check <u>SOL Released Items:</u> These items are from the 2014 and 2015 released tests and correspond to A.4a. <u>SOL Released Items:</u> These items are from the 2014 and 2015 released tests and correspond to A.4c. https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-4ae-prog-equations.pdf https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-4c-lit-eq-formulas.pdf		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.5ac	Multistep Inequality Applications of Multistep Inequalities	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to • Solve multistep linear inequalities in one variable algebraically and represent the solution graphically. (5a) • Apply the properties of real numbers and properties of inequality to solve multistep linear inequalities in one variable algebraically. (5a)
Instructional Days	The students will solve	
4	a. multistep linear inequalities in one variable algebraically and represent the	

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

	solution graphically; and c. practical problems involving inequalities.	- Solve practical problems involving linear inequalities. (5c) - Determine whether a coordinate pair is a solution of a linear inequality or a system of linear inequalities. (5c)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Inequality, solution, graph of inequality, transitive property of inequality, addition property of inequality, subtraction property of inequality, multiplication property of inequality, division property of inequality, bounded, half-plane, commutative property of addition/multiplication, identity property of addition/multiplication, inverse property of addition/multiplication		- How is solving a multistep linear inequality the same as solving a multistep linear equation? How is it different? - Why is it important to represent the solutions to a multistep linear inequality on a number line? - How can understanding the properties of real numbers and properties of inequality help when solving a multistep linear inequality? - What does the solution of a linear inequality represent? - How can using a graphing utility help you to understand solving and representing inequalities?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic Textbook/Worksheets/Other Resources envision Algebra 1 <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.5a SOL A.5a (Word) / PDF / Desmos Just in Time Quick Check SOL A.5c (Word) / PDF / Desmos (Questions #1 and #2) Just in Time Quick Check https://www.doe.virginia.gov/instruction/mathematics/middle/algebra_readiness/formative-assess/pfa/fa-1a-5ac.pdf		

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5a-sol-ineq-one-var.pdf

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5a-lemnade-ineq.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.6abc	Slope, Equations, and Graph of a Line The student will	The student will use problem-solving, mathematical communication, mathematical reasoning, connections, and representations to
Instructional Days	a. determine the slope of a line when given an equation of the line, the graph of the line, or two points on the line;	
4	b. write the equation of a line when given the graph of the line, two points on the line, or the slope and a point on the line; and c. graph linear equations in two variables.	- Determine the slope of the line, given the equation of a linear function. (6a) - Determine the slope of a line, given the coordinates of two points on the line. (6a) - Determine the slope of a line, given the graph of a line. (6a) - Recognize and describe a line with a slope or rate of change that is positive, negative, zero, or undefined. (6a) - Write the equation of a line when given the graph of a line. (6b) - Write the equation of a line when given two points on the line whose coordinates are integers. (6b) - Write the equation of a line when given the slope and a point on the line whose coordinates are integers. (6b) - Write the equation of a vertical line as $x = a$. (6b) - Write the equation of a horizontal line as $y = c$. (6b) - Write the equation of a line parallel or perpendicular to a given line through a given point. (6b) - Graph a linear equation in two variables, including those that arise from a variety of practical situations. (6c) - Use the parent function $y = x$ and describe transformations defined by changes in the slope or y-intercept. (6c)

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Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Slope, slope formula, slopes of lines, vertical line, horizontal line, parent function, translation, reflection, dilation, standard form, slope intercept form, point-slope form, equivalent forms of linear function, perpendicular lines, parallel lines, point, linear equation, linear function, graph, rate of change, positive slope, negative slope, zero slope, undefined slope		- What does it mean if a line that has a slope that is positive, negative, zero, or undefined? - How do you determine the best method to use when writing the equation of a line? - What is the relationship between the slopes of parallel lines? - What is the relationship between the slopes of perpendicular lines? - How can you write the equation of a line parallel or perpendicular to a given line through a given point? - How can you graph a linear equation? - How do you describe transformations of linear equations based on the parent function $y = x$?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Algebra 1, All Things Algebra Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.6ab. <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.6bc. SOL A.6a (Word) / PDF / Desmos Just in Time Quick Check SOL A.6b (Word) / PDF / Desmos Just in Time Quick Check SOL A.6c (Word) / PDF / Desmos Just in Time Quick Check https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-6abc-slope2sl-desmos.pdf		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.4 de	Systems of Equations	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to
Instructional Days	The students will solve	

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5	d. systems of two linear equations in two variables algebraically and graphically; and e. practical problems involving equations and systems equations.	- Given a system of two linear equations in two variables, that has a unique solution, solve the system by substitution or elimination to identify the ordered pair, which satisfies both equations. (4d) - Given a system of two linear equations in two variables that has a unique solution, solve the system graphically by identifying the point of intersection. (4d) - Solve and confirm algebraic solutions to a system of two linear equations using a graphing utility. (4d) - Determine whether a system of two linear equations has one, an infinite number, or no solutions. (4d) - Write a system of two linear equations that models a practical situation. (4e) - Interpret and determine the reasonableness of the algebraic or graphical solution of a system of two linear equations that models a practical situation. (4e) - Solve practical problems involving equations and systems of equations. (4e)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Systems of linear equations (substitution), system of linear equations (elimination), system of linear equations (graphing), systems of linear equations (number of solutions), parallel lines, system of linear equations, coinciding, point of intersection		- How is the graph of a system of equations related to its solution? - What does it mean if a system of two linear equations has one solution? An infinite number of solutions? No solutions? - How can you determine the most efficient method for solving a system of linear equations? - Why is it important to interpret the solution to a system of equations? - How can you determine if the solution to a system of two linear equations is reasonable for a practical situation? Why is this important? - How can a system of equations be used to solve a practical problem?
Resources/Technology		
Textbook/Worksheets/Other Resources		

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Technology

Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic

VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.4e, which is covered in Systems of Equations and Inequalities.

SOL A.4d (Word) / PDF / Desmos Just in Time Quick Check

SOL A.4e (Word) / PDF / Desmos Just in Time Quick Check

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-4de-road-trip-solv-sys.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.5 bd	Linear Inequalities and Systems of Linear Inequalities	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Represent the solution of a linear inequality in two variables graphically. (5b) - Solve practical problems involving linear inequalities. (5c) - Determine whether a coordinate pair is a solution of a linear inequality or a system of linear inequalities. (5c) - Represent the solution of a system of two linear inequalities graphically. (5d) - Determine and verify algebraic solutions using a graphing utility. (5a, b, c, d)
Instructional Days	The students will	
4	b. represent the solution of linear inequalities in two variables graphically; and d. represent the solution to a system of inequalities graphically.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Inequality, solution, graph of inequality, transitive property of inequality,		- How is solving a multistep linear inequality the same as solving a multistep linear equation? How is it different? - How is the graph of a linear inequality in two variables similar to the graph of a linear equation in two variables? How are they different? - What does the solution of a linear inequality represent?

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addition property of inequality, subtraction property of inequality, multiplication property of inequality, division property of inequality, bounded, half-plane, commutative property of addition/multiplication, identity property of addition/multiplication, inverse property of addition/multiplication	- What does the solution of a system of linear inequalities represent? - How can using a graphing utility help you to understand solving and representing inequalities?
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Resources/Technology

Textbook/Worksheets/Other Resources

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Technology

Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic

VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.5bcd.

SOL A.5b (Word) / PDF / Desmos Just in Time Quick Check

SOL A.5c (Word) / PDF / Desmos Just in Time Quick Check

SOL A.5d (Word) / PDF / Desmos Just in Time Quick Check

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5b-ineq-2-var-desmos.pdf

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-A-5d-sys-lin-ineq-desmos.pdf

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.8	Direct and Inverse Variation	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to
Instructional Days	The student, given a data set or practical situation,	Given a data set or practical situation, determine whether a direct variation exists. (8)

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6	will analyze a relation to determine whether a direct or inverse variation exists, and represent a direct variation algebraically and graphically and an inverse variation algebraically.	- Given a data set or practical situation, determine whether an inverse variation exists. (8) - Given a data set or practical situation, write an equation for a direct variation. (8) - Given a data set or practical situation, write an equation for an inverse variation. (8) - Given a data set or practical situation, graph an equation representing a direct variation.(8)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Direct variation, inverse variation, independent variable, dependent variable, variation, constant of variation, directly proportional, constant of proportionality		- How can you determine whether a direct variation exists in a data set or practical situation? - How can you determine whether an inverse variation exists in a data set or practical situation? - What is the difference between direct and inverse variation? - How do you write an equation for a direct variation situation? - How do you write an equation for an inverse variation situation? - How do you graph an equation representing a direct variation?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources <u>SOL Released Items</u>: These items are from the 2014 and 2015 released tests and correspond to A.8 <u>SOL A.8</u> (Word) / (PDF) / (Desmos) https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-8-direct-variation.pdf https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/mip/a1/mip-a-8-inverse-variation.pdf		

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SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.2 abc	Laws of Exponents, Polynomials and Factoring	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Simplify monomial expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents. (2a) - Model sums, differences, products, and quotients of polynomials with concrete objects and their related pictorial and symbolic representations. (2b) - Determine sums and differences of polynomials. (2b) - Determine products of polynomials. The factors should be limited to five or fewer terms (i.e., $(4x + 2)(3x + 5)$ represents four terms and $(x + 1)(2x^2 + x + 3)$ represents five terms). (2b) - Determine the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor. (2b) - Factor completely first- and second-degree polynomials in one variable with integral coefficients. After factoring out the greatest common factor (GCF), leading coefficients should have no more than four factors. (2c) - Factor and verify algebraic factorizations of polynomials with a graphing utility. (2c)
Instructional Days	The student will perform operations on polynomials, including	
9	a. applying the laws of exponents to perform operations on expressions; b. adding, subtracting, multiplying, and dividing polynomials; and c. factoring completely first- and second-degree binomials and trinomials in one variable.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) exponential form, negative exponent, zero exponent, product of powers property, power of a product property, quotient of powers property, monomial, exponent, base, simplify, power, laws of exponents, ratios, binomial, trinomial, first-degree, second-degree, polynomial,		- Why is it important to understand exponents? - How can I simplify expressions containing exponents? - Can two algebraic expressions that appear to be different be equivalent? - How can we use the polynomial operations in practical situations? - How is modeling operations of polynomials with concrete objects, pictures, and symbols useful?

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factoring, difference of two squares, leading coefficient, greatest common factor, monomial divisor, prime polynomial, binomial divisor

- What are some practical situations that would require operations with polynomials?
- Why do we factor polynomials?
- How is a difference of squares different from other polynomials? How is it the same?
- What is the relationship between the factor(s) of a polynomial and the graph of the polynomial?

Resources/Technology

Textbook/Worksheets/Other Resources

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Algebra 1, All Things Algebra

Technology

Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic

VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.2a.

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.2bc

Just in Time Quick Checks

SOL A.2a (Word) / PDF / Desmos

SOL A.2b (Word) / PDF / Desmos

Mathematics Instructional Plans

A.2a - Laws of Exponents (Word) / PDF Version

A.2b - Dividing Polynomials Using Algebra Tiles (Word) / PDF Version

A.2b - Multiplying Polynomials Using Algebra Tiles (Word) / PDF Version

A.2b - Adding and Subtracting Polynomials Using Algebra Tiles (Word) / PDF Version

A.2c - Factoring Polynomials / PDF Version

Fourth Nine Weeks

Algebra 1 Pacing Guide

2022-2023

https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

Apr 2023				
M	T	W	T	F
3	4	5	6	7
10	11	12	13	14
17	18	19	20	21
24	25	26	27	28

May 2023				
M	T	W	T	F
1	2	3	4	5
8	9	10	11	12
15	16	17	18	19
22	23	24	25	26
29	30	31		

Jun 2023				
M	T	W	T	F
			1	2
5	6	7	8	9
12	13	14	15	16
19	20	21	22	23
26	27	28	29	30

|

Pre-Assessment
Holiday

Checkpoint Assessment
Teacher Workday

Benchmark Assessment
End of Nine Weeks

Units	Topics	Standards of Learning	# of Days	Dates
UNIT #4	Holiday		6	April 7-14, 2023
	Square Roots and Cube Roots	A.3 abc	4	April 17-20, 2023
	Functions and Relations	A.7 abcdef	8	April 21, 24-28, May 1-2, 2023
	Checkpoint Assessment		3	May 3-5, 2023
	Quadratic Equations	A.4b, A.7 cdf	5	May 3-4, 8-10, 2023
	Line and Curve of Best Fit	A.9	5	May 11-12, 15-17, 2023
	Review for SOL/ Final Examination	All Standards of Learning	10	May 18-19, 22-26, 30-31, June 1, 2023
	Holiday		1	May 29, 2023
	Review for SOL Retakes/Review for Final Examination	All Standards of Learning	3	June 5-8, 2023
	Final Examination	All Strand of Learning	1	Any day within June 12-16, 2023 <i>Note: Other days are allotted for completion of requirements</i>

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SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.3.abc	Square Roots and Cube Roots	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Express the square root of a whole number in simplest form. (3a) - Express the principal square root of a monomial algebraic expression in simplest form where variables are assumed to have positive values. (3a) - Express the cube root of an integer in simplest form. (3b) - Simplify a numerical expression containing square or cube roots. (3c) - Add, subtract, and multiply two monomial radical expressions limited to a numerical radicand. (3c)
Instructional Days	The student will simplify	
4	a. square roots of whole numbers and monomial algebraic expressions; b. cube roots of integers; and c. numerical expressions containing square or cube roots.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Square root, cube root, product property of radicals, quotient property of radicals, radical, whole number, radicand, integer, numeric expression, simplest form, principal square root, radical expression, prime factorization, monomial, perfect square, perfect cube, factors, consecutive integers		- How is finding the square root of a whole number different from finding the square root of an algebraic expression? How are they the same? - What is the relationship between perfect squares and square roots? Perfect cubes and cube roots? - How does an understanding of combining like terms help when simplifying radical expressions? - How does understanding simplifying radicals help when simplifying radical expressions?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic		

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VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.3.

Just in Time Quick Check

[SOL A.3a](#) (Word) / [PDF](#) / [Desmos](#)

[SOL A.3b](#) (Word) / [PDF](#) / [Desmos](#)

[SOL A.3c](#) (Word) / [PDF](#) / [Desmo](#)

Mathematics Instructional Plans

[A.3a - Simplifying Square Roots of Monomial Expressions](#) (Word) / [PDF Version](#)

[A.3b - Simplify Cube Roots of Integers](#) (Word) / [PDF Version](#)

[A.3c - Simplify Numerical Expressions with Square and Cube Roots](#) (Word) / [PDF Version](#)

SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.7 abcdef	Relations and Functions The student will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Determine whether a relation, represented by a set of ordered pairs, a table, a mapping, or a graph is a function. (7a) - Identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically. (7bcdd) - For any value, x, in the domain of f, determine $f(x)$. (7e) - Represent relations and functions using verbal descriptions, tables, equations, and graph. Given one representation, represent the relation in another form. (7f) - Investigate and analyze characteristics and multiple representations of functions with a graphing utility. (7abcdef)
Instructional Days 8	a. determining whether a relation is a function; b. domain and range; c. zeros; d. intercepts; e. values of a function for elements in its domain; and f. connections between and among multiple representations of functions using verbal descriptions, tables, and graphs	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF)		What makes a relation a function?

Algebra 1 Pacing Guide

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Linear, quadratic, functions, function notation, relation, domain, range, roof, zeros, x-intercepts, y-intercepts, set notation, tables, graphs, equations, dependent variables, input, output

- What are the different ways functions can be represented?
- How can you determine whether a relation is a function when given a set of ordered pairs, a table, a mapping, or a graph?
- How can you identify the domain and range of a function?
- How can you identify the zeros of a function?
- How can you identify the intercepts of a function?
- How can you find $f(x)$ for a given value or set of given values of x ?
- How do you investigate characteristics of functions with a graphing utility?

Resources/Technology

Textbook/Worksheets/Other Resources

envision Algebra 1

Algebra 1, All Things Algebra

Technology

Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, Problem attic

VDOE Resources

SOL Released Items: These items are from the 2014 and 2015 released tests and correspond to A.7

Just in Time Quick Checks

[SOL A.7a \(Word\)](#) / [PDF](#) / [Desmos](#)

[SOL A.7b \(Word\)](#) / [PDF](#) / [Desmos](#)

[SOL A.7c \(Word\)](#) / [PDF](#) / [Desmos](#)

[SOL A.7d \(Word\)](#) / [PDF](#) / [Desmos](#)

[SOL A.7e \(Word\)](#) / [PDF](#) / [Desmos](#)

[SOL A.7f \(Word\)](#) / [PDF](#) / [Desmos](#)

Mathematics Instructional Plans

[A.7abef - Functions 1: Investigating Relations and Functions \(Word\)](#) / [PDF Version](#)

[A.7aef- Square Patios \(Word\)](#) / [PDF Version](#)

[A.7bcd - Functions 2: Exploring Quadratic Functions \(Word\)](#) / [PDF Version](#)

[A.7cd - Quadratic Connections \(Word\)](#) / [PDF Version](#)

[A.7cd - Solving Linear Equations Using Functions with Desmos \(Word\)](#) / [PDF Version](#)

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SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.4.b and A.7.cdf	Quadratic Equations	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Solve quadratic equations in one variable algebraically. Solutions may be rational or irrational. (4b) - Identify the domain, range, zeros, and intercepts of a function presented algebraically or graphically. (7c) - Use the x-intercepts from the graphical representation of a quadratic function to determine and confirm its factors. (7cd) - Represent relations and functions using verbal descriptions, tables, equations, and graph. Given one representation, represent the relation in another form. (7f) - Investigate and analyze characteristics and multiple representations of functions with a graphing utility. (7cdf)
Instructional Days	b. solve quadratic equations in one variable algebraically	
5	The students will investigate and analyze linear and quadratic function families and their characteristics both algebraically and graphically, including: c. zeros; d. intercepts; and f. connections between and among multiple representations of functions using verbal descriptions, tables, equations, and graphs.	
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Vertical translation, horizontal translation, vertical dilation, reflection, roots, zeros, x-intercepts, solutions		- What methods can you use to solve a quadratic equation algebraically? - How can you identify the zeros of a function? - How can you use the x-intercepts from a quadratic function to determine its factors? - How can you identify the intercepts of a function? - How can you use the x-intercepts from a quadratic function to determine its factors?

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		How can you represent relations and functions using verbal descriptions, tables, equations, and graphs?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, Problem attic VDOE Resources <u>SOL Released Items:</u> These items are from the 2014 and 2015 released tests and correspond to A.7 Just in Time Quick Checks SOL A.7c (Word) / PDF / Desmos SOL A.7d (Word) / PDF / Desmos SOL A.7f (Word) / PDF / Desmos Mathematics Instructional Plans A.7abef - Functions 1: Investigating Relations and Functions (Word) / PDF Version A.7aef- Square Patios (Word) / PDF Version A.7bcd - Functions 2: Exploring Quadratic Functions (Word) / PDF Version A.7cd - Quadratic Connections (Word) / PDF Version A.7cd - Solving Linear Equations Using Functions with Desmos (Word) / PDF Version		
SOL #	Topic	Essential Knowledge, Skills, and Understanding
A.9	Line and Curve of Best Fit	The student will use problem solving, mathematical communication, mathematical reasoning, connections, and representations to - Determine an equation of a curve of best fit, using a graphing utility, given a set of no more than twenty data points in a table, a graph, or a practical situation. (9) - Make predictions, using data, scatterplots, or the equation of the curve of best fit. (9) - Solve practical problems involving an equation of the curve of best fit. (9)
Instructional Days	The student will collect and analyze data, determine the equation of the curve of best fit in order to make predictions, and solve practical problems, using mathematical models of linear and quadratic functions	
5		

Algebra 1 Pacing Guide

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf

		Evaluate the reasonableness of a mathematical model of a practical situation. (9)
Essential Vocabulary		Essential Questions
Bolded words are listed in the VDOE Word Wall Cards (Word) / (PDF) Curve of best fit, scatterplot, outlier data, linear functions, quadratic functions		- What is the process to determine an equation of a curve of best fit? - How do you make predictions using data, scatterplots, or the equation of the curve of best fit? - How can you solve practical problems involving an equation of the curve of best fit? - How can you evaluate the reasonableness of a curve of best fit for a practical situation?
Resources/Technology		
Textbook/Worksheets/Other Resources envision Algebra 1 Technology Study Island, IXL, Quizziz, Kahoot, Wootmath, Khan Academy, Desmos, Canvas, YouTube, Problem attic VDOE Resources SOL A.9 (Word) / PDF / Desmos Just in Time Quick Check Mathematics Instructional Plans A.9 - Curve of Best Fit 1 with Desmos (Word) / PDF Version A.9 - Curve of Best Fit 2 (Word) / PDF Version		

Resources for SOL Review or Review for Final Examination:

<https://education.jlab.org/solquiz/>

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https://www.doe.virginia.gov/testing/sol/standards_docs/mathematics/2016/cf/algebra1-cf.pdf
<https://www.solpass.org/released-online/alg1-2015/framepage.php?section=study-2>

https://www.doe.virginia.gov/testing/sol/practice_items/testnav8.shtml

Algebra I Eight Ball Review Packet Virginia SOL, Teachers Pay Teachers

Algebra I SOL Review 150 Questions, Teachers Pay Teachers

<https://www.lcps.org/Page/236562>

https://www.doe.virginia.gov/testing/sol/released_tests/2015/algebra_1_released_in_spring_2015.pdf

https://www.doe.virginia.gov/testing/sol/performance_analysis/math/2014/2014_algebra_1.pdf

https://www.doe.virginia.gov/testing/sol/released_tests/2013/algebra_1_released_in_spring_2014.pdf

Study Island

IXL