Content:

Part I

- Algebra 1 Honors Course Description
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Algebra 1 Honors – Course Code: 1200320
B.E.S.T. Course Description

In Algebra 1, instructional time will emphasize five areas: (1) performing operations with polynomials and radicals, and extending the Laws of Exponents to include rational exponents; (2) extending understanding of functions to linear, quadratic and exponential functions and using them to model and analyze real-world relationships; (3) solving quadratic equations in one variable and systems of linear equations and inequalities in two variables; (4) building functions, identifying their key features and representing them in various ways and (5) representing and interpreting categorical and numerical data with one and two variables.

All clarifications stated, whether general or specific to Algebra1 Honors, are expectations for instruction of that benchmark.

Curricular content for all subjects must integrate critical-thinking, problem-solving, and workforce-literacy skills; communication, reading, and writing skills; mathematics skills; collaboration skills; contextual and applied-learning skills; technology-literacy skills; information and media-literacy skills; and civic-engagement skills.

Florida's Benchmarks for Excellent Student Thinking (B.E.S.T.) Standards
This course includes Florida's B.E.S.T. ELA Expectations (EE) and Mathematical Thinking and Reasoning Standards (MTRs) for students. Florida educators should intentionally embed these standards within the content and their instruction as applicable. For guidance on the implementation of the EEs and MTRs, please visit https://www.cpalms.org/Standards/BEST_Standards.aspx and select the appropriate B.E.S.T. Standards package.
English Language Development ELD Standards Special Notes Section

Teachers are required to provide listening, speaking, reading and writing instruction that allows English language learners (ELL) to communicate information, ideas and concepts for academic success in the content area of Mathematics. For the given level of English language proficiency and with visual, graphic, or interactive support, students will interact with grade level words, expressions, sentences and discourse to process or produce language necessary for academic success. The ELD standard should specify a relevant content area concept or topic of study chosen by curriculum developers and teachers whic

Mathematical Thinking & Reasoning Standards

MTR: *Because Math Matters* [illegible]

Mathematical Thinking & Reasoning Standards			
MA.K12.MTR.4.1	MA.K12.MTR.5.1	MA.K12.MTR.6.1	MA.K12.MTR.7.1
Engage in discussions that reflect on the mathematical thinking.			

ELA& ELDGuide

Pacing Chart

Approximate Time	Critical Concept Unit s	Benchmarks	Critical Concept Unit Overview – Level 3.0
1st Quarter 2 Flex Days: Includes classroom expectations			Students will: ƒ 1.1: Understand that linear equations can be used to solve mathematical and real -world problems. Write and solve linwms.
24.5 Days	1 Solving Equations and Inequalities	MA.912.AR.1.2 MA.912.AR.2.1 MA.912.AR.2.6 MA.912.AR.4.1 MA.912.AR.4.2	

Algebra 1 Honors – Course Code: 12320

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Algebra 1 Honors

Year at a Glance

SY2024-25

	Classroom Expectations
	Topic 1: Solving Equations and Inequalities
	Topic 2: Linear Equations
	Topic3: Linear and Absolute Value Functions
	Topic3: Linear and Absolute Value Functions

Teacher Critical Concept

Algebra 1
Honors

9 1.3: Understand that literal equations are equations with two or more variables. They are solved by r earranging the equation to isolate the variable of interest.

- o MA.912.AR.1.2: Rearrange equations or formulas to isolate a quantity of interest.
  - *f* Clarification 1: Instruction includes using formulas for temperature, perimeter, area and volume; using equations for linear (standard, slope-intercept and point-slope forms) and quadratic (standard, factored and vertex forms) functions.

9 1. 4: Understand that the solution to an inequality in one variable is solved by using the properties of inequalities. Write and solve inequalities using real- world context.

- o MA.912.AR.2.6: Given a mathematical or real -world context, write and solve one-variable linear ineq ualities, including compound inequalities. Represent solutions algebraically or graphically.

9 1. 5: Understand that a compound inequality is a combination of two or more inequalities used to describe multiple constraints and explain when it can be written as one or two statements.

- o MA.912.AR.2.6: Given a mathematical 28 Tm (.2 (l)-828 g (n))-2.2 (8)-5.9 (a)14.2 (l)]TJ (v6470 Tw 13.802 0 Td (-)Tj -0.001 Tc 0.001 Tw

	9 1.1: Solve linear equations with one variable using the properties of equality. 9 1.2: Use the properties of equality to solve linear equations with variables on both sides. 9 1.2: Identify whether linear equations have one solution, infinitely many solutions, or no solution. 9 1.3: Rewrite literal equations. 9 1.4: Solve inequalities and graph the solutions in one variable. 9 1.4: Interpret solutions to inequalities within the context of the word problem . 9 1.4 : Solve inequalities with infinitely many or no solutions 9 1.5: Write and solve a system of inequalities. 9 1.5: Interpret the solution to a compound inequality within a modeling context. 9 1.6: Solve absolute value equations. 9 1.6: Use absolute value equations to solve problems. 9 1.6H: Solve absolute value inequalities. 9 1.6H: Use absolute value inequalities to solve problems.	• Compound Inequality • Element • Equation (Absolute Value, Linear, Literal)	• Linear Expression • Set • Subset
		enVision Florida B.E.S.T. Algebra 1 1-1 Solving Linear Equations 1-2 Solving Equations with a Variable on Both Sides 1-3 Literal Equations and Formula 1-4 Solving Inequalities in One Variable 1-5 Compound Inequalities 1-6 Absolute Value Equations and Inequalities	
1.5	Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content.		
1.0	With help, partial success at score 2.0, content and score 3.0 content.		
0.5	With help, partial success at score 2.0 content but not at score 3.0 content.		
0	Even with help, no success.		

Proficiency Scales

CHARLOTTE

Student Name:	Student Critical Concept	TOPIC 1

Algebra 1 Honors	Teacher Critical Concept Linear Equations	Topic 2
	M.C. Formative Assessment Name: DFA Algebra 1 Honors Topic 2 Linear Equations	MA. 912.AR.2. 2, MA.912.AR.2.4, MA.912.AR.1. 2, MA.912.AR. 2.5, MA.912.AR.1. 1,MA.912.AR.2.3

	The student will:	Resources & Assignments
4.0		

3.5 In addition .7 (t)131DC 0 -1.1.4 (a)13.46

- Clarification 3: Instruction includes cases where one var iable has a coefficient of zero.
- Clarification 4: Instruction includes representing the domain and range with inequality notation, interval notation or set-builder notation.
- Clarification 5: Within the Algebra 1 course, notations for domain and range are limited to inequality and set-builder notations.

9 2.2: Understand that the point- slope form of a linear equation is used to write the equation of a line using the slope and any point on the line.

- MA.912.AR.1.2: Rearrange equations or formulas to isolate a quantity of interest.
  - Clarification 1: Instruction includes using formulas for temperature, perimeter, area and volume; using equations for linear (standard, slope-intercept and point-slope forms) and quadratic (standard, factored and vertex forms) functions.
- MA.912.AR.2. 2: Write a linear two -variable equation to represent

	o MA.912.AR.2. 2: Write a linear two -variable equation to represent relationships between quantities from a graph, a written description or a table of values within a mathematical or real -world context. o MA.912.AR.2.4: Given a table, equation or written description of a linear function, graph that function, and determine and interpret its key features. o MA.912.AR.2.5: Solve and graph mathematical and real -world problems that are modeled with linear functions. Interpret key features and determine constraints in terms of the context . 9 2.4: Understand that the equations of lines can be used to help identify whether the lines are parallel or perpendicular. Parallel lines have the same slope but different intercepts; perpendicular lines have slopes that are negative reciprocals. o MA.912.AR.2.3: Write a linear two -variable equation for a line that is parallel or perpendicular to a given line and goes through a given point . ƒ Clarification 1: Instruction focuses on recognizing that perpendicular OLQHV KDYH VORSHV WKDW ZKHQ PXOWLSOLHG UHVXOW LQ ï DQG WKDW SDUDOOH have slopes that are the same. ƒ Clarification 2: Instruction includes representing a line with a pair of points on the coordinate plane or with an equation. ƒ Clarification 3: Problems include cases where one variable has a coefficient of zero.	
2.5	No major error or omissions regarding score 2.0 content, and partial success at score	

	9 2.4: Write equations to represent lines that are pa rallel or perpendicular to a given line. 9 2.4: Graph lines to show an understanding of the relationship between the slopes of parallel and perpendicular lines. 9 2.4: Solve real-world problems with parallel or perpendicular lines.	
1.5	Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content.	
1.0	With help, partial success at score 2.0, content and score 3.0 content.	
0.5	With help, partial success at score 2.0 content but not at score 3.0 content.	
0	Even with help, no success.	

Student Name:	Student Critical Concept Linear Equations	TOPIC 2 MA.912.AR.2.2,MA.912.AR.2.4, MA.912.AR.1.2, MA.912.AR.2.5, MA.912.AR.1.1,MA.912.AR.2.3

Optional Enrichment

I can:

Graph a linear equation in slope intercept form

Write an equation in slope intercept form from a graph.

Write linear equations in two variables using slope-intercept form to represent the relationship between two quantities, x and y.

Write and graph linear equations in point-slope form.

Write and graph linear equations in standard form.

Find the x- and y-intercepts given an equation in standard form.

Write equations to represent lines that are parallel to a given line.

2.0

Write equations to represent lines that are perpendicular to a given line.

Graph lines to show an understanding of the relationship between the slopes of

Algebra 1 Honors	Teacher Critical Concept Linear and Absolute Value Functions	Topic 3
	M.C. Formative Assessment Name: DFA Algebra 1 Honors Topic 3 Linear and Absolute Value Functions	MA. 912.AR.2. 5, MA.912.AR.2.4, MA.912. F.1.2, MA.912. F.1.5, MA.912. FL.3.2, MA.912.FL.3.4, MA.912.F .2.1, MA.912.AR.4.3, MA.912.F.1.6

The student will:

4.0

9 3.2: Understand that linear functions can be represented in multiple ways, using words, tables, graphs, and rules. Function notation is a way to write the rule for a function f. The output of the function f(x), reads " f of x" means that f is a function of the input variable x.

- MA.912.AR.2.4: Given a table, equation or written description of a linear function, graph that function, and determine and interpret its key feate af
  - Clarification 1: Key features are limited to domain, range, intercepts and rate of change.
  - Clarification 2: Instruction includes the use of standard form, slope-intercept form and point-slope form.
  - Clarification 3: Instruction includes cases where one variable has a coefficient of zero.
  - Clarification 4: Instruction includes representing the domain and range with inequality notation, interval notation or set-builder notation.
- MA.912.AR.2.5: Solve and graph matheme atical and real -word problems thaare modeled with linear functions. Inpret key feate afand detmine constains in tms of the cont .
- MA.912.F.1.2: Given a function aepresen in function notaion, evalute the function for an inpu in its dome ain. For a real
  - Clarification 1: Instruction includes using formulas for temperature, perimeter, area and volume; using equations for linear (standard, slope-intercept and point-slope forms) and quadratic (standard, factored and vertex forms) functions.
- MA.912.F.1.5: Compare key feate af of linear functons each (a)[(f)1presen al gebraically, ge aaphically, in tables or wa8.2 (i)-2.5 (t)3.7 (t)9.6 (en)-3.8 ( )0.6 (d)-1.7 (e)-5.9 (scr)-2.2 (i)9.5 (p)-11.7 (t)9.6 (i)3.5 (on)-3.7
  - Clarification 1: Within the Algebra 1 course, interest is limited to simple and compound.
- MA.912.FL.3.4: Explain the (a)[3 (e)6.1 (l)-8.4 (a)2.2 (t)9.6 (i)3.6 (on)-3.8 (s)-5.9 (h)-3.8 (i)9.6 (p)0.6 (be)-11.9 (t)3.7 (w)16.7 (1)-5.9 (en exponental ge aowth and the (a)[(f)1lationship betw1encontinuously compounded intaft and exponental growth
  - Clarification 1: Within the Algebra 1 course, exponential growth is limited to compound interest.

	o MA.912.F.2.1: Identify the effect on the graph or table of a given function after replacing $f(x)$ by $f(x) + k$, $f(kx)$, $f(x+k)$ and $kf(x)$ for specific values of k	
2.5	No major error or omissions regarding score 2.0 content, and partial success at score 3.0 content.	

The student will:

9 3.1: Describe the domain and range of a function using inequalities and set-builder notation and interval notation.

9 3.1: Determine a reasonable domain and identify constraints on the domain based on the context of a real-world problem.

9

2.0

	vertex. Understand that for the absolute value function can be written as: g (x)=a|x -h|+k. Understand that the values of the constant h gives us the x-coordinate of the vertex and translates the graph horizontally. Understand that the values of the constant k gives us the y-coordinate of the vertex and translates the graph vertically. Understand that the value of the leading coefficient a affects the vertical stretch or compression.	
2.5	I have mastered 2.0 content and with help I am successful at 3.0 content.	

I can:

Describe the domain (x) and range (y) of a function using inequalities and set-builder notation and imcDeralunotation .

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2.0

Teacher Critical Concept
Systems of Linear Equations and Inequalities

	9 4.3: Understand that elimination is an alternate method for solving systems of equations when it is not easy to use substitution. Multiply one or both equations by a constant to get like coefficients that are opposite to use elimination. o MA.912.AR.9.1: Given a mathematical or real-world context, write and solve a system of two- variable linear equations algebraically or graphically. o MA.912.AR.9.6: Given a real-world context, represent constraints as systems of linear equations or inequalities. Interpret solutions to problems as viable or non-viable options. ƒ Clarification 1: Instruction focuses on analyzing a given function that models a real-world situation and writing constraints that are represented as linear equations or linear inequalities. 9 4.4: Understand that the graph of a linear inequality in two variables shows the solutions of th e inequality as a half-plane above or below the boundary line. The boundary line is included in the solution when the inequality symbol is " or • and excluded when the inequality symbol is < or >. o MA.912.AR.2.7: Write two-variable linear inequalities to represent relationships between quantities from a graph or a written description within a mathematical or real-world context ƒ Clarification 1: Instruction includes the use of standard form, slope-intercept form and point-slope form and any inequality symbol can be represented. ƒ Clarification 2: Instruction includes cases where one variable has a coefficient of zero. o MA.912.AR.2.8: Given a mathematical or real-world context, graph the solution set to a two- variable linear inequality. ƒ Clarification 1: Instruction includes the use of standard form, slope-intercept form and point-slope form and any inequality symbol can be represented. ƒ Clarification 2: Instruction includes cases where one variable has a coefficient of zero. 9 4.5: Understand that systems of lin ear inequalities can be solved by graphing. The solution of a system of inequalities is the intersection of the corresponding half-planes, exclud ing the boundary lines in the case of a strict inequality. o MA.912.AR.9.4: Graph the solution set of a system of two-variable linear inequalities. ƒ Clarification 1: Instruction includes cases where one variable has a coefficient of zero. ƒ Clarification 2: Within the Algebra 1 course, the system is limited to two inequalities.	

	o MA.912.AR.9.6: Given a real-world context, represent constraints as systems of linear equations or inequalities. Interpret solutions to problems as viable or non-viable options.	
2.5	No major error or omissions regarding score 2.0 content, and partial success at score 3.0 content.	

The student will:

9

2.0

Proficiency Scales

Student Name:

Student Critical Concept

Optional Enrichment

Algebra 1 Honors	Teacher Critical Concept Exponents and Exponential Functions M.C. Formative Assessment Name: DFA Algebra 1 Honors Topic 5 Exponents and Exponential Functions	Topic 5 MA.912.NSO.1.1, MA.912.NSO.1.2, MA.912.NSO.1.4, MA.912.AR.5.4, MA.912.AR.5.6, MA.912.F.1.1, MA.912.F.1.2, MA.912.F.1.8, MA.912.AR.1.1, MA.912.AR.5.3, MA.912.F.1.3, MA.912.FL.3.2, MA.912.FL.3.4

		Resources & Assignments
4.0	The student will: 	
3.5	In addition to score 3.0 performance, partial success at score 4.0 content.	
3.0	The student will: 9 5.1: Understand that the properties of exponents can be applied to algebraic expressions and extended to include rational exponents. The properties of exponents can be used to write equivalent radical expressions with rational exponents. o MA.912.NSO.1.1: Extend previous understanding of the Laws of Exponents to include rational exponents. Apply the Laws of Exponents to evaluate numerical expressions and generate equivalent numerical expressions involving rational exponents. ƒ Clarification 1: Instruction includes the use of technology when appropriate. ƒ Clarification 2: Refer to the K-12 Formulas (Appendix E) for the Laws of Exponents. ƒ Clarification 3: Instruction includes converting between expressions involving rational exponents and expressions involving radicals. o MA.912.NSO.1.2: Generate equivalent algebraic expressions using the properties of exponents.	

9 5.2 : Understand tha

f

- MA.912 .FL.3.4:

Algebra 1 Honors	Teacher Critical Concept Polynomials and Factoring	Topic 6
	M.C. Formative Assessment Name: DFA Algebra 1 Honor s Topic 6 Polynomials and Factorin g	MA.912.AR.1.3, MA.912.AR.1.4, MA.912.AR.1.7, MA.912.AR.1.1

		Resources & Assignments
4.0	The student will:	
3.5	In addition to score 3.0 performance, partial success at score 4.0 content.	

The student will:

9 6.1: Understand that a polynomial is a monomial or the sum or differences of two or more monomial s (terms). Polynomials can be added or subtracted by combining like te rms. Polynomials are closed under addition or subtraction, similar to integers.

3.0

9 6.3: Understand that the product of th e square of a binomial in the form
: ‡ E ^Û¸

	When a binomial has the pattern ‡Û F Ø, then it can be factored as : ‡ E ˆ ; : ‡ F ˆ ;. o MA.912.AR.1.1: Identify and interpret parts of an equation or expression that represent a quantity in terms of a mathematical or real-world context, including viewing one or more of its parts as a single entity. ƒ Clarification 1: Parts of an expression include factors, terms, constants, coefficients and variables. o MA.912.AR.1.7: Rewrite a polynomial expression as a product of polynomials over the real number system.	
2.5	No major error or omissions regarding score 2.0 content, and partial success at score 3.0 content.	
2.0	The student will: 9 6.1: Identify the parts of a polynomial, such as coefficients, variables, and constants. 9 6.1: Classify polynomials by number of terms and by degree. 9 6.1: Write a polynomial in standard form. 9 6.1: Add or subtract two polynomials and recognize that polynomials are closed under addition and subtraction, just as the integers are. 9 6.2: Use the Distributive Property with polynomials, recognizing that polynomials are closed under multiplication. 9 6.2: Multiply polynomials using a table and area method. 9 6.2: Apply the product of polynomials to solve real-world problems. 9 6.3: Determine the square of a binomial. 9 6.3: Find the product of a sum and difference of two squares.	The student will recognize or recall specific vocabulary: • Closure Property • Degree of a Monomial • Degree of a Polynomial • Difference of Two Squares • Monomial • Polynomial • Standard Form of a Polynomial enVision Florida B.E.S.T. Algebra 1 6-1 Adding and Subtracting Polynomials 6-2 Multiplying Polynomials 6-3 Multiplying Special Cases 6-4 Factoring Polynomials 6-5 Factoring žÛ E ˆ ž E ‰ 6-6 Factoring ‡ žÛ E ˆ ž E ‰ 6-7 Factoring Special Cases

	9 6.3: Solve real-world problems involving the square of a binomial. 9 6.4: Divide a polynomial by a monomial. 9 6.4: Find the greatest common factor of a polynomial. 9 6.4: Write polynomials in factored form. 9 6.5: Factor a trinomial in form ž^Û E ^ ž E by finding two binomial factors whose product is equal to the trinomial. 9 6.5: Identify patterns in the signs of the coefficients of the terms of a trinomial expression and use those patterns to determine the signs of the second terms in the binomial factors. 9 6.6: Identify the common factor of the coefficients in the terms of a trinomial expression when ‡ M Ú 9 6.6: Write a quadratic trinomial as a product of two binomial factors. 9 6.7: Identify parts of polynomials to factor them as the difference of two squares or as a perfect square. 9 6.7: Use a polynomial to represent a measurement in a real-world situation and describe how a factored form of the polynomial relates to that situation.	
1.5	Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content.	
1.0	With help, partial success at score 2.0, content and score 3.0 content.	
0.5	With help, partial success at score 2.0 content but not at score 3.0 content.	
0	Even with help, no success.	

Understand that when a trinomial has the pattern as (=+ :)(=+ :) or (=+ :) ^{6}.	$=^6$+ 2 = :+ >^{6}, then it can be factored
Understand that when a trinomial has the pattern as (= F :)(= F :) or (= F :) ^{6}.	$=^6$ F2 =>+ >^{6}, then it can be factored
Understand that when a binomial has the pattern (=+ :)(=	$=^6$ F >^{6}, then it can be factored as

Teacher Critical Concept

Algebra 1
Honors

	decreases to a minimum and then increases. Quadratic functions may also model strictly increasing or decreasing data. o MA.912.F.1.1: Given an equation or graph that defines a function, class ify the function type. Given an input -output table, determine a function type that could represent it . ƒ Clarification 1: Within the Algebra 1 course, functions represented as tables are limited to linear, quadratic and exponential. ƒ Clarification 2: Within the Algebra 1 course, functions represented as equations or graphs are limited to vertical or horizontal translations or reflections over the T -axis of the following parent functions: B (T) = T, B(T) = T6, B(T) = T7, B(T) = ¾T, B(T) = /¾T, B(T) =	T|, B(T) = 2 ë, B(T) = @5ë6A. o MA.912.F.1.6: Compare key features of linear and nonlinear functions each represented algebraically, graphically, in tables or written descriptions. ƒ Clarification 1: Key features are limited to domain; range; intercepts; intervals where the function is increasing, decreasing, positive or negative; end behavior and asymptotes. ƒ Clarification 2: Within the Algebra 1 course, functions other than linear, quadratic or exponential must be represented graphically. ƒ Clarification 3: Within the Algebra 1 course, instruction includes verifying that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. o MA.912.F.1.8: Determine whether a linear, quadratic or exponential function best models a given real -world situation. ƒ Clarification 1: Instruction includes recognizing that linear functions model situations in which a quantity changes by a constant amount per unit interval; that quadratic functions model situations in which a quantity increases to a maximum, then begins to decrease or a quantity decreases to a minimum, then begins to increase; and that exponential functions model situations in which a quantity grows or decays by a constant percent per unit interval. ƒ Clarification 2: Within this benchmark, the expectation is to identify the type of function from a written description or table.	
2.5	No major error or omissions regarding score 2.0 content, and partial success at score 3.0 content.	
2.0	The student will: 9 7.1: Identify key features of the graph of a quadratic function using graphs, tables, and equations. 9 7.1: Explain the effect of the value of a on the quadratic parent function. 9 7.2: Identify key features of the graph of quadratic functions written in vertex for m. 9 7.2: Graph quadratic functions in vertex form. 9 7.3: Graph quadratic functions in standard form and show intercepts, maxima, and minima. 9 7.3: Determine how the values of a, b, and c affect the graph of (Ez) = ‡ Z2+ ˆ ž+ ‰	The student will recognize or recall specific vocabulary: • Parabola • Quadratic Function • Standard Form of a Quadratic

9 7.3: Identify key features of parabolas.

9 7.3: Compare properties of quadratic functions presented in different forms (algebraically, in a table, graphically).

9 7.3: Write and graph the quadratic function in standard form.

9 7.4: Use quadratic functions fitted to data to model real-world situations.

Understand that the standard form of a quadratic function is $E(T) = =\rceil^{6} + \ >T + \ ?$ where c is the y -coordinate of the y -intercept and the axis of symmetry is the line $T = \frac{?\tilde{O}}{6\dot{O}}$

[redacted]

problems.

Algebra 1 Honors	Teacher Critical Concept Solving Quadratic Equations	Topic 8 MA. 912. AR.3.6, MA.912.AR.3.7, MA.912.AR.3.8, MA.912.AR.1.2, MA.912.AR.3.1, MA.912.AR.3.5, MA.912.AR.1.1

- MA.912.AR.1.2: Rearrange equations or formulas to isolate a quantity of interest.
- MA.912.AR.3.1: Given a mathematical or real -world context, write and solve one-variable quadratic equations over the real number system.
- MA.912. AR.3.6:

Student Name:	Student Critical Concept Solving Quadratic Equations	TOPIC 8
M.C. Formative Assessment Name: DFA Algebra 1 Honors Topic 8 Solving Quadratic Equations	My Score:	MA.912.AR.3.6, MA.912.AR.3.7, MA.912.AR.3.8, MA.912.AR.1.2, MA.912.AR.3.1, MA.912.AR.3.5, MA.912.AR.1.1

4.0 Optional Enrichment

By the end of the topic, I will be able to solve :

Resources & Assignments

Mary was rollerblading at the local skate park. She went from side of the ramp to the other side of the ramp which can be modeled by the function $3T^6 + 9TF4 = 0$. How long did it take her to go from one side of the ramp to the other side of the ramp? Interpret the solution(s) in terms of time.

Algebra 1	Teacher Critical Concept Working with Functions	Topic 9
	M.C. Formative Assessment Name: DFA Algebra 1 Honors Topic 9 Working with Functions	MA.912.F.1.1, MA.912.F.1.2, MA.912.F.1.3, MA.912.AR.3.7, MA.912.AR.4.3, MA.912.AR.5.6, MA.912.F.1.5, MA.912.F.1.6

		Resources & Assignments
4.0	The student will: Write the equation of the following functions given the transformations. Then, state the domain, range, intercepts, intervals where increasing/decreasing, intervals where positive/negative, and end behavior. 1. A square root function translated 4 right, 2 down, reflected across the x-axis, with a vertical stretch by a factor of 2 2. A cubic function translated 5 up, 1 left, with a vertical compression by a factor of $\frac{5}{6}$. 3. A cube root function translated 7 down, 3 right, with a vertical stretch by a factor of 3.	
3.5	In addition to score 3.0 performance, partial success at score 4.0 content.	

The student will:

9 9.1: Understand that a square root function contains a square root symbol with the independent variable in the radicand and understands its characteristics.

3.0

- *f* Clarification 1: Instruction includes making the connection to determining the slope of a particular line segment.

9 9.2: Understand that

- MA.912.F.1.1: Given an equation or graph that defines a function, classify the function type. Given an input-output table, determine a function type that could represent it.
- MA.912.F.1.5: Compare key features of linear functions each represented algebraically, graphically, in tables or written descriptions.
  - Clarification 1: Key features are limited to domain; range; intercepts; slope and end behavior
- MA.912.F.1.6: Compare key features of linear and nonlinear functions each represented algebraically, graphically, in tables or written descriptions.
  - Clarification 1: Key features are limited to domain; range; intercepts; intervals where the function is increasing, decreasing, positive or negative; end behavior and asymptotes.
  - Clarification 2: Within the Algebra 1 course, functions other than linear, quadratic or exponential must be represented graphically.
  - Clarification 3: Within the Algebra 1 course, instruction includes verifying that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically.

9 9.3H: Understand how to identify the transformation and calculate the value of k of a transformation given f(x) and the transformation of f(x) in the forms of f(x)+k, kf(x), f(kx), and f(x + k).

- MA.912.F.2.3: Given the graph or table of *f(x)* and the graph or table of *f(x)+ G*, *G(x)*, *f(Gx)* and *f(x+ G)*, state the type of trof( )10(ofati7TC229 (r)-.2 (bi)10.6 (.6 (of)-83 ( )-5.4 (t)21.6 (r)-8 20754TC21 1 T4T4 Tm (r)-8

9 9.2: Identify key features of the graph of cubic and cube root functions and identify translations of them.

9 9.2: Model real-world situations using the cube root and cubic function.

9 9.3: Use different representations to identify function types.

9 9.3: Analyze the key features and transformations of a function to identify the type of function it represents.

9 9.3H: Identify the type of transformation when comparing two functions given f(x) and g(x).

9 9.3H: Calculate the value of k given 9

	Understand how to identify the transformation and calculate the value of k of a transformation given f(x) and the transformation of f(x) in the form of f(kx). Understand how to identify the transformation and calculate the value of k of a transformation given f(x) and the transformation of f(x) in the form of f(x + k). Understand how fw95 (a)368(t)ctions can be combined by operations. Understand the difference between the domain of the original function and the new function.	

- MA.912.DP.1.1: Given a set of data, select an appropriate method to represent the data, depending on whether it is numerical or categorical data and on whether it is univariate or bivariate.
  - Clarification 1: Instruction includes discussions regarding the strengths and weaknesses of each data display.
  - Clarification 2: Numerical univariate includes histograms, stem-and-leaf plots, box plots and line plots; numerical bivariate includes scatter plots and line graphs; categorical univariate includes bar charts, circle graphs, line plots, frequency tables and relative frequency tables; and categorical bivariate includes segmented bar charts, joint frequency tables and joint relative frequency tables.
  - Clarification 3: Instruction includes the use of appropriate units and labels and, where appropriate, using technology to create data displays.
- MA.912.DP.1.2: Interpret data distributions represented in various ways. State whether the data is numerical or categorical, whether it is univariate or bivariate and interpret the different components and quantities in the display.
- MA.912.DP.1.4: Estimate a population total, mean or percentage using data from a sample survey; develop a margin of error through the use of simulation.
  - Clarification 1: Within the Algebra 1 course, the margin of error will be given.

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9 10.2: Understand that to graph univariate categorical data, organize the data in a frequency table and plot the summary of the tables as a line plot, circle graph, or bar graph.

- MA.912.DP.1.1: Given a set of data, select an appropriate method to represent the data, depending on whether it is numerical or categorical data and on whether it is univariate or bivariate.
- MA.912.DP.1.2: Interpret data distributions represented in various ways. State whether the data is numerical or categorical, whether it is univariate or bivariate and interpret the different components and quantities in the display.

9 10.3: Understand that the association between bivariate numerical data can be represented in a scatterplot or line graph, and the association between bivariate categorical data can be represented in a two-way frequency table or a segmented bar chart.

- MA.912.DP.1.1: Given a set of data, select an appropriate method to represent the data, depending on whether it is numerical or categorical data and on whether it is univariate or bivariate.
- MA.912.DP.1.2: Interpret data distributions represented in various ways. State whether the data is numerical or categorical, whether it is univariate or bivariate and interpret the different components and quantities in the display.
- MA.912.DP.3.1: Construct a two-way frequency table summarizing bivariate categorical data. Interpret joint and marginal frequencies and determine possible associations in terms of a real-world context.

10.4: Understand that when a line is fitted to a set of data, the closer the data points are to the line, the stronger the correlation. A plot of residuals can be used to determine the line of best fit, whichis the trend line that most closely models the data.

- MA.912.DP.1.3: Explain the difference between correlation and causation in the contexts of both numerical and categorical data.
- MA.912.DP.2.4: Fit a linear function to bivariate numerical data that suggests a linear association and interpret the slope and *U*intercept of the model. Use the model to solve real-world problems in terms of the context of the data.
  - *f* Clarification 1: Instruction includes fitting a linear function both informally and formally with the use of technology.
  - *f* Clarification 2: Problems include making a prediction or extrapolation, inside and outside the range of the data, based on the equation of the line of fit.
- MA.912.DP.2.6: Given a scatter plot with a line of fit and residuals, determine the strength and direction of the correlation. Interpret strength and direction with a

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- MA.912.DP.3.2: Given marginal and conditional relative frequencies, construct a two-way relative frequency table summarizing categorical bivariate data.
    - Clarification 1: Instruction includes cases where not all frequencies are given but enough are provided to be able to construct a two-way relative frequency table.
    - Clarification 2: Instruction includes the use of a tree diagram when calculating relative frequencies to construct tables.
- MA.912.DP.3.3: Given a two-way relative frequency table or segmented bar graph summarizing categorical bivariate data, interpret joint, marginal and conditional relative frequencies in terms of a real-world context.
  Clarification 1: Instruction includes problems involving false positive and false

		10.4: Distinguish between correlation and causation.	10-5 Analyzing Two-Way Frequency Table
		10.4H: Compute residual points to analyze a correlation.	
	9	10.5: Interpret joint, marginal and conditional frequencies, and use them to make inferences.	
	9	10.5H: Use marginal and conditional frequency to create a two-way frequency table.	
	9	10.5H: Calculate and interpret joint relative frequency, marginal relative frequency and conditional relative frequency, and use them to make inferences.	
	9	10.5H: Use a tree diagram to calculate relative frequencies in order to construct a two-way frequency table.	
	9	10.5H: Recognize false positives and false negatives.	
1.5		Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content.	

Optional Enrichment