Submit comments on the draft NYS Algebra I Mathematics Learning Standards

NYS Algebra I Mathematics Learning Standards

Number and Quantity
The Real Number System (N-RN)

Cluster		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
Cluster	**B.** Use properties of rational and irrational numbers.	**N-RN.B.3**	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	3. Use properties and operations to understand different forms of rational and irrational numbers 3a. Perform operations and apply properties to generate equivalent forms of rational and irrational numbers (limited to square roots), without rationalizing denominators. 3b. Explain why (using definitions): i) the sum or product of two rational numbers is rational; ii) the sum of a rational number and an irrational number is irrational; iii) the product of a nonzero rational number and an irrational number is irrational; and iv) the product of two irrationals could be either rational or irrational.	**New standards help support work with irrational numbers started in grade 8 and future concepts that involve operations with irrational numbers in Geometry, Algebra II and advanced mathematics courses.**

Submit comments on the draft NYS Algebra I Mathematics Learning Standards

NYS Algebra I Mathematics Learning Standards					
Number and Quantity **Quantities (N-Q)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Reason quantitatively and use units to solve problems. ★	**N-Q.A.1**	1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. .	1. Use units as a way to: i) interpret and guide the solution of multi-step problems; ii) choose and interpret units consistently in formulas; and iii) choose and interpret the scale and the origin in graphs and data displays.	
		N-Q.A.2	2. Define appropriate quantities for the purpose of descriptive modeling. PARCC: In Algebra I, this standard will be assessed by ensuring that some modeling tasks (involving Algebra I content or securely held content from grades 6-8) require the student to create a quantity of interest in the situation being described. For example, a quantity of interest is not selected for the student by the task. For example, In a situation involving data, the student might autonomously decide that a measure of center is a key variable in a situation, and then choose to work with the mean.	REMOVE STANDARD	**The committee feels that this standard is addressed in the mathematical practices MP 2 and MP 4.**
		N-Q.A.3	3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. NYSED: In Algebra I, the greatest precision for a result is only at the level of the least precise data point (example: if units are tenths and hundredths, then the appropriate preciseness is tenths). Calculation of relative error is not included in this standard.	3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. The greatest precision for a result is only at the level of the least precise data point. For example, if units are tenths and hundredths, then the appropriate preciseness is tenths.	

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NYS Algebra I Mathematics Learning Standards					
Algebra Seeing Structure in Expressions (A-SSE)					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Interpret the structure of expressions.	**A-SSE.A.1**	1. Interpret expressions that represent a quantity in terms of its context. ★	NO CHANGE	
		A-SSE.A.1a	1a. Interpret parts of an expression, such as terms, factors, and coefficients. NYSED: The "such as" listed are not the only parts of an expression students are expected to know; others include, but are not limited to, degree of a polynomial, leading coefficient, constant term, and the standard form of a polynomial (descending exponents).	1a. Given a polynomial, write the standard form and interpret the parts of the polynomial: terms, factors, coefficients, degree, leading coefficient, and constant term.	
		A-SSE.A.1b	1b. Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	1b. **Fluently** interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P.	**This standard is a fluency expectation for Algebra I.**
		A-SSE.A.2	2. Use the structure of an expression to identify ways to rewrite it. For example, see x^4-y^4 as $(x^2)^2-(y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2-y^2)(x^2+y^2)$. PARCC: Tasks limited to numerical and polynomial expressions in one variable. Recognize 53^2-47^2 as a difference of squares and see an opportunity to rewrite it in the easier-to -evaluate form (53+47)(53-47). See an opportunity to rewrite $a^2+9a+14$ as (a+7)(a+2). NYSED: Does not include factoring by grouping	2a. Use the structure of an expression to identify ways to rewrite it. For example, see x^4-y^4 as $(x^2)^2-(y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2-y^2)(x^2+y^2)$. Note: Does not include factoring by grouping and factoring the sum and difference of cubes.	

			and factoring the sum and difference of cubes.		

NYS Algebra I Mathematics Learning Standards

Algebra
Seeing Structure in Expressions (A-SSE)

		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
Cluster	B. Write expressions in equivalent forms to solve problems. ★			B. Write expressions in equivalent forms to reveal their characteristics. ★	**Change cluster heading, expressions cannot be solved.**
		A-SSE.B.3	3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	NO CHANGE	
		A-SSE.B.3a	3a. Factor quadratic expression to reveal the zeros of the function it defines. NYSED: Includes trinomials with leading coefficients other than 1.	3a. Factor quadratic expressions completely: i) using the greatest common factor; ii) recognizing the difference of two perfect squares; and iii) with trinomials where the leading coefficient is +/- 1 only after removing possible GCF.	

		A-SSE.B.3b	3b. Complete the square in a quadratic expression to reveal the max and min value of the function it defines.	REMOVE STANDARD	**Committee feels that teachers should have discretion in instruction about rewriting quadratic expressions thru the process of completing the square. Concept is embedded in standards A.REI.B.4a and F.IF.C.8a.**
Cluster	B. Write expressions in equivalent forms to solve problems. ★	**A-SSE.B.3c**	3c. Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t} = 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%. PARCC: Tasks are limited to exponential expressions with integer exponents. Tasks have a real-world context. As described in the standard, there is an interplay between the mathematical structure of the expression and the structure of the situation such that choosing and producing an equivalent form of the expression reveals something about the situation.	3c. Use the properties of exponents to rewrite exponential expressions. Algebra I tasks are limited to exponential expressions whose exponent contains a linear expression in which the linear term has an integer coefficient. For example 3^{2x} can be rewritten as $(3^2)^x$ which is 9^x or $252.290(0.9439)^{t-3}$=$252.290(0.9439)^t(0.9439)^{-3}$ is approximately $300(0.9439)^t$. https://www.illustrativemathematics.org/content-standards/HSA/SSE/B/3/tasks/1305	**Committee feels that rational exponents should be addressed solely in Algebra II.**

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NYS Algebra I Mathematics Learning Standards					
Algebra **Arithmetic with Polynomials and Rational Expressions (A-APR)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Perform arithmetic operations on polynomials.	**A-APR.A.1**	1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials. .	1. **Fluently** add, subtract, and multiply polynomials.	**Standard is a fluency expectation for Algebra I. The closure property has been removed.**

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NYS Algebra I Mathematics Learning Standards					
Algebra **Arithmetic with Polynomials and Rational Expressions (A-APR)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	B. Understand the relationship between zeros and factors of polynomials.	**A-APR.B.3**	3. Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. PARCC: Tasks are limited to quadratic and cubic polynomials in which linear and quadratic factors are available. For example, find the zeros of (x-2) (X^2-9).	3. Identify zeros of polynomials. 3a. Identify: i) the zeros of quadratic and cubic polynomials in which linear and quadratic factors are available; For example, find the zeros of (x-2) (x^2-9)=0. ii) the graph of the function defined by the polynomial equation; and iii) an appropriate equation of a function given the zeros of that function.	

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NYS Algebra I Mathematics Learning Standards					
Algebra **Creating Equations (A-CED)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Create equations that describe number or relationships. ★	**A-CED.A.1**	1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions. PARCC: Tasks are limited to linear, quadratic, or exponential equations with integer exponents.	1a. Create equations and linear inequalities in one variable to represent a real world context. Limit equations to linear, quadratic, and simple exponentials.	
		A-CED.A.2	2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	2. Create equations and linear inequalities in two variables to represent a real world context. Limit equations to linear, quadratic, and simple exponentials.	**Three variables is an expectation of Algebra II.**
		A-CED.A.3	3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.	NO CHANGE	
		A-CED.A.4	4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V=IR to highlight resistance R.	NO CHANGE	

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NYS Algebra I Mathematics Learning Standards					
Algebra Reasoning with Equations and Inequalities (A-REI)					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Understand solving equations as a process of reasoning and explain the reasoning.	**A-REI.A.1**	1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. PARCC: Tasks are limited to quadratic equations.	1a. Identify the property used in each step when solving a linear or quadratic equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	

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NYS Algebra I Mathematics Learning Standards					
Algebra **Reasoning with Equations and Inequalities (A-REI)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	B. Solve equations and inequalities in one variable.	**A-REI.B.3**	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	NO CHANGE	
		A-REI.B.4	4. Solve quadratic equations in one variable. NYSED: Solutions may include simplifying radicals.	4. Solve quadratic equations in one variable. Solutions may include simplifying radicals.	

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NYS Algebra I Mathematics Learning Standards					
Algebra **Reasoning with Equations and Inequalities (A-REI)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	B. Solve equations and inequalities in one variable.	**A-REI.B.4a**	4a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	4a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x-p)^2 = q$ that has the same solutions. Note: The quadratic's leading coefficient must be 1 and the coefficient of the linear term must be even (after factoring out any GCF).	**Committee feels that deriving the quadratic formula should be teacher discretion since completing the square involves rational coefficients.**
		A-REI.B.4b	4b. Solve quadratic equations by inspection (e.g., for $x^2=49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a + bi, a - bi for real numbers a and b. PARCC: Tasks do not require students to write solutions for quadratic equations that have roots with non-zero imaginary parts. However, tasks can require the student to recognize cases in which a quadratic equation has no real solutions.	4b. Solve quadratic equations by: i) inspection; ii) taking square roots; iii) factoring; iv) completing the square; and v) the quadratic formula. Recognize when the quadratic formula yields no real solutions.	

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NYS Algebra I Mathematics Learning Standards					
Algebra **Reasoning with Equations and Inequalities (A-REI)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	C. Solve systems of Equations	**A-REI.C.5**	5. Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	5. Justify that, given a system of two equations in two variables, replacing one equation by a multiple of that equation produces a system with the same solution.	
		A-REI.C.6	6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. PARCC: Tasks have a real-world context. Tasks have hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.).	6a. Solve systems of linear equations in two variables both algebraically and graphically.	

		A.REI.C.7a	NEW ADDITION	7a. Solve a system, with rational solutions, consisting of a linear equation and a quadratic equation (parabolas only) in two variables both algebraically and graphically.	**Committee feels that this standard should be added since linear and quadratic functions (parabolas) are addressed in Algebra I. This work also links to standard A.REI.D.11.**

NYS Algebra I Mathematics Learning Standards					
Algebra **Reasoning with Equations and Inequalities (A-REI)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	D. Represent and solve equations and inequalities graphically.	**A-REI.D.10**	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	10. Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane.	
		A-REI.D.11	11. Explain why the x-coordinates of the points where the graphs of the equations y=f(x) and y=g(x) intersect are the solutions of the equation f(x)=g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ★ PARCC: Tasks that assess conceptual understanding of the indicated concept may involve any of the function types mentioned in the standard except exponential and logarithmic functions. Finding the solutions approximately is limited to cases where f(x) and g(x) are polynomial functions.	11. Given the equations y=f(x) and y=g(x): i) recognize that each x-coordinate of the intersection(s) is the solution to the equation f(x)=g(x); and ii) find the solutions approximately using technology to graph the functions or make tables of values; and iii) interpret the solution in context. ★ Algebra I Cases are limited to where f(x) and g(x) are linear, polynomial, absolute value and simple exponential functions.	

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NYS Algebra I Mathematics Learning Standards				
Algebra **Reasoning with Equations and Inequalities (A-REI)**				
	Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster D.Represent and solve equations and inequalities graphically.	**A-REI.D.12**	12. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	NO CHANGE	

NYS Algebra I Mathematics Learning Standards

Functions
Interpreting Functions (F-IF)

Cluster		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
	A. Understand the concept of a function and use function notation.	**F-IF.A.1**	1. Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of f is the graph of the equation y = f(x).	1. Define a function in terms of domain and range, and the graph of f is the graph of the equation y = f(x). Note: Domain and range can be expressed using inequality, set builder, or interval notations.	
		F-IF.A.2	2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	NO CHANGE	
		F-IF.A.3	3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1. PARCC: This standard is part of the Major work in Algebra I and will be assessed accordingly.	3a. Recognize that a sequence is a function whose domain is a subset of the integers. Sequences must be written explicitly and only in subscript notation.	**Functional notation for sequences and recursive forms should be introduced in Algebra II.**

NYS Algebra I Mathematics Learning Standards					
Functions Interpreting Functions (F-IF)					
		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
Cluster	B. Interpret functions that arise in applications in terms of the context. ★	**F-IF.B.4**	4. For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. PARCC: Tasks have a real-world context. Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piece-wise defined functions (including step functions and absolute value functions) and exponential functions with domains in the integers.	4a. For a function that models a relationship between two quantities: i) interpret key features of graphs and tables in terms of the quantities; and ii) sketch graphs showing key features given a verbal description of the relationship. Algebra I Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maxima, minima; and symmetries. Tasks have a real-world context and are limited to the following functions: linear, quadratic, square root, cube root, piece-wise defined (including step and absolute value) and simple exponential.	
		F-IF.B.5	5. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.	5. Determine the domain of a function from its graph and, where applicable, identify the appropriate domain for a function in context.	
		F-IF.B.6	6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. PARCC: Tasks have a real-world context. Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piece-wise defined functions (including step functions and absolute value functions) and exponential functions with domains in the integers.	6a. Calculate and interpret the average rate of change of a function presented over a specified interval. Algebra I tasks have a real-world context and are limited to the following functions: linear, quadratic, square root, cube root, piece-wise defined (including step and absolute value), and simple exponential.	

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NYS Algebra I Mathematics Learning Standards					
Functions **Interpreting Functions (F-IF)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	C. Analyze functions using different representations.	**F-IF.C.7**	7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ★	7. Graph functions expressed as an equation and show key features of the graph, by hand in simple cases and by using technology in cases that are more complicated. ★	
		F-IF.C.7a	7a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	7a. Graph linear, quadratic and simple exponential functions and show intercepts, maxima, and minima. Note: Graphing linear functions is a **fluency** expectation for Algebra I.	
		F-IF.C.7b	7b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	NO CHANGE	

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Functions Interpreting Functions (F-IF)					
		Standard Code	Current Standard	Revised Standard Recommendation for 2018-19	Additional Information/Notes
Cluster	C. Analyze functions using different representations.	**F-IF.C.8**	8. Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	8. Write a function in different but equivalent forms to reveal and explain different properties of the function.	
		F-IF.C.8a	8a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	8a. Use the process of factoring and completing the square in a quadratic function to show zeros, maxima, minima, and symmetry of the graph, and interpret these in terms of a context.	
		F-IF.C.9	9. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum. PARCC: Tasks are limited to linear functions, quadratic functions, square root, cube root, piecewise defined (including step functions and absolute value functions), and exponential functions with domains in the integers.	9a. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). A1 Course: Tasks are limited to the following functions: linear, quadratic, square root, cube root, piecewise defined (including step and absolute value), and simple exponential.	

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NYS Algebra I Mathematics Learning Standards					
Functions **Building Functions (F-BF)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Build a function that models a relationship between two quantities.	**F-BF.A.1**	1. Write a function that describes a relationship between two quantities. ★	1. Write a function that describes a relationship between two quantities. ★ Algebra I Course is limited to linear, quadratic and simple exponential functions.	
		F-BF.A.1a	1a. Determine an explicit expression, a recursive process, or steps for calculation from a context. PARCC: Tasks have a real-world context. Tasks are limited to linear, quadratic and exponential functions with domains in the integers.	1a. Determine a function from context. Algebra I: Define a sequence explicitly or steps for calculation from a context.	**The committee feels that the recursive process should be covered in Algebra II.**

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NYS Algebra I Mathematics Learning Standards					
Functions **Building Functions (F-BF)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	B. Build new functions from existing functions.	**F-BF.B.3**	3. Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. PARCC: Identifying the effect on the graph of replacing f(x) by f(x) +k, kf(x), and f(x+k) for specific values of k (both positive and negative) is limited to linear and quadratic functions. Experimenting with cases and illustrating an explanation of the effects on the graph using technology is limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers. Tasks do not involve recognizing even and odd functions.	3a. Using f(x) + k, k f(x), and f(x + k): i) Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), and f(x + k) for specific values of k (both positive and negative); ii) Find the value of k given the graphs; iii) Write a new function using the value of k; and iv) Use technology to experiment with cases and explore the effects on the graph. Algebra I tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, absolute value functions, and simple exponential functions.	**Moving f(kx) to Algebra II because of its level of complexity.**

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NYS Algebra I Mathematics Learning Standards					
Functions **Linear, Quadratic and Exponential Models (F-LE) ★**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Construct and compare linear, quadratic, and exponential models and solve problems.	**F-LE.A.1**	1. Distinguish between situations that can be modeled with linear functions and with exponential functions.	NO CHANGE	
		F-LE.A.1a	1a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	1a. Justify that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	
		F-LE.A.1b	1b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	1b.Recognize when a model has a constant rate of change and identify the model as linear.	
		F-LE.A.1c	1c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	1c. Recognize when a model has a constant percent rate of change and identify the model as exponential.	

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NYS Algebra I Mathematics Learning Standards					
Functions **Linear, Quadratic and Exponential Models (F-LE) ★**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Construct and compare linear, quadratic, and exponential models and solve problems.	**F-LE.A.2**	2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). PARCC: Tasks are limited to constructing linear and exponential functions in simple context (not multi-step).	2a. Construct a linear or exponential function rule given: i) a graph; ii) a description of the relationship; and iii) two input-output pairs (include reading these from a table). Simple exponential function limit for Algebra I.	
		F-LE.A.3	3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	NO CHANGE	

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NYS Algebra I Mathematics Learning Standards					
Functions Linear, Quadratic and Exponential Models (F-LE) ★					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	B. Interpret expressions for functions in terms of the situation they model.	**F-LE.B.5**	5. Interpret the parameters in a linear or exponential function in terms of a context. PARCC: Tasks have a real-world context. Exponential functions are limited to those with domains in the integers.	5. Interpret the parameters in a linear or exponential function in terms of a context. Simple exponential function limit for Algebra I.	

NYS Algebra I Mathematics Learning Standards					
Statistics and Probability **Interpreting categorical and quantitative data (S-ID)**					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	A. Summarize, represent, and interpret data on a single count or measurement variable.	**S-ID.A.1**	1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	NO CHANGE	
		S-ID.A.2	2. Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (inter-quartile range, standard deviation) of two or more different data sets.	NO CHANGE	
		S-ID.A.3	3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	NO CHANGE	

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NYS Algebra I Mathematics Learning Standards					
Statistics and Probability Interpreting categorical and quantitative data (S-ID)					
		Standard Code	**Current Standard**	**Revised Standard Recommendation for 2018-19**	**Additional Information/Notes**
Cluster	B. Summarize, represent, and interpret data on two categorical and quantitative variables.	**S-ID.B.5**	5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	NO CHANGE	

[Submit comments on the draft NYS Algebra I Mathematics Learning Standards]

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Cluster	B.Summarize, represent, and interpret data on two categorical and quantitative variables.	**S-ID.B.6**	6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	NO CHANGE	
		S-ID.B.6a	6a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. PARCC: Tasks have real world context. Exponential functions are limited to those with domains in the integers. NYSED: Includes the regression capabilities of the calculator.	6a. Fit a function to real-world data; use functions fitted to data to solve problems in the context of the data. Use the given functions or choose a function suggested by the context. Algebra I emphasis is on linear, quadratic, and exponential models and includes the regression capabilities of the calculator.	
		S-ID.B.6b	6b. Informally assess the fit of a function by plotting and analyzing residuals. NYSED: Includes creating residual plots using the capabilities of the calculator (not manually).	REMOVE STANDARD	**The committee feels the analysis of residuals is a skill not needed for Algebra II and is a topic that deserves to be developed more appropriately in a statistics class.**

		S-ID.B.6c	6c. Fit a linear function for a scatter plot that suggests a linear association. NYSED: Both correlation coefficient and residuals will be addressed in this standard.	REMOVE STANDARD.	**Redundant with S-ID.B.6 and S-ID.C.8.**

NYS Algebra I Mathematics Learning Standards

Statistics and Probability
Interpreting categorical and quantitative data (S-ID)

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Cluster	C. Interpret linear models.	**S-ID.C.7**	7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	NO CHANGE	
		S-ID.C.8	8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	8. Calculate (using technology) and interpret the correlation coefficient of a linear fit.	
		S-ID.C.9	9. Distinguish between correlation and causation.	NO CHANGE	