TNReady Algebra I Blueprint

Clusters on Part I	# of Items in Part I	% of Part I	Additional Clusters on Part II (All Part I Clusters will also be assessed on Part II)	# of Items in Part II	% of Part II	% of Test
Structure and operations with expressions and quantities • Properties of rational and irrational numbers • Use units to solve problems • Interpret the structure of expressions • Write expressions in equivalent forms • Perform arithmetic operations on polynomials • Relationships between zeros and polynomial factors	4–7	17–28%	No additional clusters	5–7	15–21%	19–21%
Create equations that describe numbers or relationships	3–6	13–24%	No additional clusters	2–4	6–12%	12–17%
Reason with equations and inequalities • Understand solving equations • Solve equations and inequalities	2–6	8–24%	Reason with equations and inequalities • Solve systems of equations • Represent and solve equations and inequalities graphically	8–10	26–30%	19–21%
Interpreting and building functions • Understand the concept of a function and use function notation • Interpret functions that arise in applications in terms of the context • Analyze functions using different representations	7–9	28–38%	Interpreting and building functions • Build new functions from existing functions	7–8	21–24%	26–28%
Construct and compare linear, quadratic and exponential functions • Construct and compare linear, quadratic, and exponential models	3–5	12–21%	Construct and compare linear, quadratic and exponential functions • Interpret expressions for functions in terms of the situation they model	1–3	3–6%	7–10%
No content from these clusters will be assessed on Part I	0	0%	Interpreting categorical and quantitative data • Summarize, represent, and interpret data on a single count or measurement variable • Summarize, represent, and interpret data on two categorical and quantitative variables • Interpret linear models	6–8	18–20%	9–11%
Total	24–26	100%	Total	33–35	100%	100%

Reading the Revisions: The totals on the blueprints released in Spring 2015 were estimated totals of the test forms. The revised blueprints reflect actual totals for the test forms. The Form Summaries line provides the range of actual form totals. There are multiple forms per grade.

Part I – Calculator Allowed

Cluster	Standards		# of Items
Structure and operations with expressions and quantities	N-RN – Use properties of rational and irrational numbers	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.	4–7
	N-Q – Reason quantitatively and use units to solve problems	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.	
		Define appropriate quantities for the purpose of descriptive modeling.	
		Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
	A-SSE.A – Interpret the structure of expressions	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	
		Use the structure of an expression to identify ways to rewrite it.	
	A-SSE.B – Write expressions in equivalent forms to solve problems	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.	
	A-APR.A – Perform arithmetic operations on polynomials	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.	
	A-APR.B – Understand the relationship between zeros and factors of polynomials	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.	
Create equations that describe numbers or relationships	A-CED – Create equations that describe numbers or relationships	Create equations and inequalities in one variable and use them to solve problems.	3–6
		Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	
		Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.	
		Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	

Reason with equations and inequalities	A-REI.A – Understand solving equations as a process of reasoning and explain the reasoning	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.	2–6
	A-REI.B – Solve equations and inequalities in one variable	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	
		Solve quadratic equations in one variable. a. 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. b. 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 $a \pm bi$ for real numbers a and b.	
Interpreting and building functions	F-IF.A – Understand the concept of a function and use function notation	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 $y = f(x)$.	7–9
		Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	
		Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	
	F-IF.B – Interpret functions that arise in applications in terms of context	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	
		Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	
		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.	
	F-IF.C – Analyze functions using different representations	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	
		Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. 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.	
		Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	

	F-BF.A – Build a function that models a relationship between two quantities	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	
Construct and compare linear, quadratic and exponential functions	F-LE.A – Construct and compare linear, quadratic, and exponential models and solve problems	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	3–5
		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).	
		Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	

Part II – Calculator and Non-Calculator Portions

Cluster	Standards		# of Items
Structure and operations with expressions and quantities	N-RN – Use properties of rational and irrational numbers	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.	5–7
	N-Q – Reason quantitatively and use units to solve problems	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.	
		Define appropriate quantities for the purpose of descriptive modeling.	
		Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
	A-SSE.A – Interpret the structure of expressions	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	
		Use the structure of an expression to identify ways to rewrite it.	
	A-SSE.B – Write expressions in equivalent forms to solve problems	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.	
	A-APR.A – Perform arithmetic operations on polynomials	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.	
	A-APR.B – Understand the relationship between zeros and factors of polynomials	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.	
Create equations that describe numbers or relationships	A-CED – Create equations that describe numbers or relationships	Create equations and inequalities in one variable and use them to solve problems.	2–4
		Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	
		Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.	
		Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	

Reason with equations and inequalities	A-REI.A – Understand solving equations as a process of reasoning and explain the reasoning	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.	8–10
	A.REI.B – Solve equations and inequalities in one variable	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	
		Solve quadratic equations in one variable. a. 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. b. 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 $a \pm bi$ for real numbers a and b.	
	A-REI.C – Solve systems of equations	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.	
		Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	
	A-REI.D – Represent and solve equations and inequalities graphically	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).	
		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.	
		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.	
Interpreting and building functions	F-IF.A – Understand the concept of a function and use function notation	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 $y = f(x)$.	7–8
		Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	
		Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	

	F-IF.B – Interpret functions that arise in applications in terms of context	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.	
		Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	
		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.	
	F-IF.C – Analyze functions using different representations	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	
		Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. 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.	
		Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	
	F-BF.A – Build a function that models a relationship between two quantities	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	
	F-BF.B – Build new functions from existing functions	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.	
Construct and compare linear, quadratic and exponential functions	F-LE.A – Construct and compare linear, quadratic, and exponential models and solve problems	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	1–3
		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).	
		Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	
	F-LE.B – Interpret expressions for functions in terms of the situation they model	Interpret the parameters in a linear or exponential function in terms of a context.	

Interpreting categorical and quantitative data	S-ID.A – Summarize, represent, and interpret data on a single count or measurement variable	Represent data with plots on the real number line (dot plots, histograms, and box plots).	6–8
		Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	
		Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	
	S-ID.B – Summarize, represent, and interpret data on two categorical and quantitative variables	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.	
		Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. 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. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	
	S-ID.C – Interpret linear models	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	
		Compute (using technology) and interpret the correlation coefficient of a linear fit.	
		Distinguish between correlation and causation.	

Overall Blueprint (Includes Part I and Part II)

Cluster	Standards		# of Items
Structure and operations with expressions and quantities	N-RN – Use properties of rational and irrational numbers	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.	9–14
	N-Q – Reason quantitatively and use units to solve problems	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.	
		Define appropriate quantities for the purpose of descriptive modeling.	
		Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	
	A-SSE.A – Interpret the structure of expressions	Interpret expressions that represent a quantity in terms of its context. a. Interpret parts of an expression, such as terms, factors, and coefficients. b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	
		Use the structure of an expression to identify ways to rewrite it.	
	A-SSE.B – Write expressions in equivalent forms to solve problems	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. a. Factor a quadratic expression to reveal the zeros of the function it defines. b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines. c. Use the properties of exponents to transform expressions for exponential functions.	
	A-APR.A – Perform arithmetic operations on polynomials	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.	
	A-APR.B – Understand the relationship between zeros and factors of polynomials	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.	
Create equations that describe numbers or relationships	A-CED – Create equations that describe numbers or relationships	Create equations and inequalities in one variable and use them to solve problems.	5–10
		Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	
		Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.	
		Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	

Reason with equations and inequalities	A-REI.A – Understand solving equations as a process of reasoning and explain the reasoning	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.	10–16
	A.REI.B – Solve equations and inequalities in one variable	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	
		Solve quadratic equations in one variable. a. 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. b. 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 $a \pm bi$ for real numbers a and b.	
	A-REI.C – Solve systems of equations	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.	
		Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	
	A-REI.D – Represent and solve equations and inequalities graphically	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).	
		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.	
		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.	
Interpreting and building functions	F-IF.A – Understand the concept of a function and use function notation	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 $y = f(x)$.	14–17
		Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	
		Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	

	F-IF.B – Interpret functions that arise in applications in terms of context	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.	
		Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	
		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.	
	F-IF.C – Analyze functions using different representations	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. a. Graph linear and quadratic functions and show intercepts, maxima, and minima. b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	
		Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. a. 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.	
		Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	
	F-BF.A – Build a function that models a relationship between two quantities	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	
	F-BF.B – Build new functions from existing functions	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.	
Construct and compare linear, quadratic and exponential functions	F-LE.A – Construct and compare linear, quadratic, and exponential models and solve problems	Distinguish between situations that can be modeled with linear functions and with exponential functions. a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	4–8
		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).	
		Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	
	F-LE.B – Interpret expressions for functions in terms of the situation they model	Interpret the parameters in a linear or exponential function in terms of a context.	

Interpreting categorical and quantitative data	S-ID.A – Summarize, represent, and interpret data on a single count or measurement variable	Represent data with plots on the real number line (dot plots, histograms, and box plots).	6–8
		Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	
		Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	
	S-ID.B – Summarize, represent, and interpret data on two categorical and quantitative variables	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.	
		Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. a. 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. b. Informally assess the fit of a function by plotting and analyzing residuals. c. Fit a linear function for a scatter plot that suggests a linear association.	
	S-ID.C – Interpret linear models	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	
		Compute (using technology) and interpret the correlation coefficient of a linear fit.	
		Distinguish between correlation and causation.	