Core Math I

TNCore

	Domain	Cluster	Standard	PARCC Assessment Limits
Number and Quantity	Quantities★ (N-Q)	Reason quantitatively and use units to solve problems.	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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			2. Define appropriate quantities for the purpose of descriptive modeling.	This standard will be assessed in Math I by ensuring that some modeling tasks (involving Math I content or securely held content from grades 6-8) require the student to create a quantity of interest in the situation being described (i.e., 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.
			3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
Algebra	Seeing Structure in Expressions (A-SSE)	Interpret the structure of expressions	1. 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. *For example, interpret* $P(1+r)n$ *as the product of P and a factor not depending on P.*	i) Tasks are limited to exponential expressions, including related numerical expressions.
		Write expressions in equivalent forms to solve problems	3. 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. c. Use the properties of exponents to transform expressions for exponential functions. *For example the expression* 1.15^t *can be rewritten as* $(1.15^{1/12})^{12t} \approx 1.012^{12t}$ *to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.*	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
	Creating Equations★ (A–CED)	Create equations that describe numbers or relationships	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.*	i) Tasks are limited to linear or exponential equations with integer exponents. ii) Tasks have a real-world context. iii) In the linear case, tasks have more of the hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.).
			2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	i) Tasks are limited to linear equations ii) Tasks have a real-world context. iii) Tasks have the hallmarks of modeling as a mathematical practice (less defined tasks, more of the modeling cycle, etc.).
			3. 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. *For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.*	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			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.*	i) Tasks are limited to linear equations ii) Tasks have a real-world context.

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Algebra — Reasoning with Equations and Inequalities (A-REI)	Solve equations and inequalities in one variable	3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
	Solve systems of equations	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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
	Represent and solve equations and inequalities graphically	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).	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		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.★	i) 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. ii) Finding the solutions approximately is limited to cases where f(x) and g(x) are polynomial.
		12. Graph the solutions to a linear inequality in two variables as a halfplane (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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*

	Domain	Cluster	Standard	PARCC Assessment Limits
Functions	Interpreting Functions (F-IF)	Understand the concept of a function and use function notation	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*).	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			2. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			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* $\geq$ *1.*	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		Interpret functions that arise in applications in terms of the context	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.* ★	i) Tasks have a real-world context. ii) Tasks are limited to linear 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. The function types listed here are the same as those listed in the Math I column for standards F-IF.6 and F-IF.9.
			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.* ★	i) Tasks have a real-world context. ii) Tasks are limited to linear 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.
			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. ★	i) Tasks have a real-world context. ii) Tasks are limited to linear 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. The function types listed here are the same as those listed in the Math I column for standards F-IF.4 and F-IF.9.
		Analyze functions using different representations	7. 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.	*i) Tasks are limited to linear functions.*
			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.*	i) Tasks have a real-world context. ii) Tasks are limited to linear 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. The function types listed here are the same as those listed in the Math I column for standards F-IF.4 and F-IF.6.

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	Domain	Cluster	Standard	PARCC Assessment Limits
Functions	Building Functions (F-BF)	Build a function that models a relationship between two quantities	1. 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.	i) Tasks have a real-world context. ii) Tasks are limited to linear functions and exponential functions with domains in the integers.
			2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
	Linear, Quadratic, and Exponential Models★ (F-LE)	Construct and compare linear, quadratic, and exponential models and solve problems	1. 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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			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).	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		Interpret expressions for functions in terms of the situation they model	5. Interpret the parameters in a linear or exponential function in terms of a context.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*

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Domain	Cluster	Standard	PARCC Assessment Limits
Geometry — Congruence (G-CO)	Experiment with transformations in the plane	1. Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		3. Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		5. Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
	Understand congruence in Terms of rigid motions	6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		7. Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		8. Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
	Prove geometric theorems	9. Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		10. Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		11. Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*	*There are no assessment limits for this standard. The entire standard is assessed in this course.*

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	Domain	Cluster	Standard	PARCC Assessment Limits
Statistics and Probability	Interpreting Categorical and Quantitative Data (S-ID)	Summarize, represent, and interpret data on a single count or measurement variable	1. Represent data with plots on the real number line (dot plots, histograms, and box plots).	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			2. 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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
		Summarize, represent, and interpret Data on two categorical and quantitative variables	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.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			6. 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.* c. Fit a linear function for a scatter plot that suggests a linear association.	*i)* Tasks have real-world context. ii) Tasks are limited to linear functions and exponential functions with domains in the integers.
		Interpret linear models	7. Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			8. Compute (using technology) and interpret the correlation coefficient of a linear fit.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*
			9. Distinguish between correlation and causation.	*There are no assessment limits for this standard. The entire standard is assessed in this course.*

(green)	**Major Content**	(blue)	**Supporting Content**	(yellow)	**Additional Content**

*Mathematical Modeling is a Standard for Mathematical Practice (MP4) and a Conceptual Category, and specific modeling standards appear throughout the high school standards indicated with a star (*). Where an entire domain is marked with a star, each standard in that domain is a modeling standard.