

Mathematical Process Standards

8.1 Mathematical process standards. The student uses mathematical processes to acquire and demonstrate mathematical understanding.

Tools to Know			Ways to Show			
8.1(A)	8.1(B)	8.1(C)	8.1(D)	8.1(E)	8.1(F)	8.1(G)
apply mathematics to problems arising in everyday life, society, and the workplace	use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution	select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems	communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate	create and use representations to organize, record, and communicate mathematical ideas	analyze mathematical relationships to connect and communicate mathematical ideas	display, explain, and justify mathematical ideas and arguments using precise mathematical language in written or oral communication

Knowledge and Skills Statements

8.2	Number and operations. The student applies mathematical process standards to represent and use real numbers in a variety of forms.
8.3	Proportionality. The student applies mathematical process standards to use proportional relationships to describe dilations.
8.4	Proportionality. The student applies mathematical process standards to explain proportional and non-proportional relationships involving slope.
8.5	Proportionality. The student applies mathematical process standards to use proportional and non-proportional relationships to develop foundational concepts of functions.
8.6	Expressions, equations, and relationships. The student applies mathematical process standards to develop mathematical relationships and make connections to geometric formulas.
8.7	Expressions, equations, and relationships. The student applies mathematical process standards to use geometry to solve problems.
8.8	Expressions, equations, and relationships. The student applies mathematical process standards to use one-variable equations or inequalities in problem situations.
8.9	Expressions, equations, and relationships. The student applies mathematical process standards to use multiple representations to develop foundational concepts of simultaneous linear equations.
8.10	Two-dimensional shapes. The student applies mathematical process standards to develop transformational geometry concepts.
8.11	Measurement and data. The student applies mathematical process standards to use statistical procedures to describe data.
8.12	Personal financial literacy. The student applies mathematical process standards to develop an economic way of thinking and problem solving useful in one's life as a knowledgeable consumer and investor.

Rptg Cat	STAAR	Readiness Standards	Supporting Standards
1 Numerical Representations and Relationships	5	8.2(D) order a set of real numbers arising from mathematical and real-world contexts	8.2(A) extend previous knowledge of sets and subsets using a visual representation to describe relationships between sets of real numbers 8.2(B) approximate the value of an irrational number, including π and square roots of numbers less than 225, and locate that rational number approximation on a number line 8.2(C) convert between standard decimal notation and scientific notation

Rptg Cat	STAAR	Readiness Standards	Supporting Standards
2 Computations and Algebraic Relationships	22	8.4(B) graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship	8.4(A) use similar right triangles to develop an understanding that slope, m , given as the rate comparing the change in y -values to the change in x -values, $(y_2 - y_1)/(x_2 - x_1)$, is the same for any two points (x_1, y_1) and (x_2, y_2) on the same line
		8.4(C) use data from a table or graph to determine the rate of change or slope and y -intercept in mathematical and real-world problems	8.5(A) represent linear proportional situations with tables, graphs, and equations in the form of $y = kx$
3 Geometry and Measurement	20	8.5(G) identify functions using sets of ordered pairs, tables, mappings, and graphs	8.5(B) represent linear non-proportional situations with tables, graphs, and equations in the form of $y = mx + b$, where $b \neq 0$
		8.5(I) write an equation in the form $y = mx + b$ to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations	8.5(E) solve problems involving direct variation
4 Data Analysis and Personal Financial Literacy	9	8.8(C) model and solve one-variable equations with variables on both sides of the equal sign that represent mathematical and real-world problems using rational number coefficients and constants	8.5(F) distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form $y = kx$ or $y = mx + b$, where $b \neq 0$
			8.5(H) identify examples of proportional and non-proportional functions that arise from mathematical and real-world problems
		8.10(C) explain the effect of translations, reflections over the x - or y -axis, and rotations limited to 90° , 180° , 270° , and 360° as applied to two-dimensional shapes on a coordinate plane using an algebraic representation	8.8(A) write one-variable equations or inequalities with variables on both sides that represent problems using rational number coefficients and constants
		<i>SEs Not Included in Assessed Curriculum</i>	8.8(B) write a corresponding real-world problem when given a one-variable equation or inequality with variables on both sides of the equal sign using rational number coefficients and constants
			8.9(A) identify and verify the values of x and y that simultaneously satisfy two linear equations in the form $y = mx + b$ from the intersections of the graphed equations
			8.3(A) generalize that the ratio of corresponding sides of similar shapes are proportional, including a shape and its dilation
			8.3(B) compare and contrast the attributes of a shape and its dilation(s) on a coordinate plane
			8.6(A) describe the volume formula $V = Bh$ of a cylinder in terms of its base area and its height
			8.6(C) use models and diagrams to explain the Pythagorean theorem
			8.7(D) determine the distance between two points on a coordinate plane using the Pythagorean theorem
			8.8(D) use informal arguments to establish facts about the angle sum and exterior angle of triangles, the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles
			8.10(A) generalize the properties of orientation and congruence of rotations, reflections, translations, and dilations of two-dimensional shapes on a coordinate plane
			8.10(B) differentiate between transformations that preserve congruence and those that do not
			8.10(D) model the effect on linear and area measurements of dilated two-dimensional shapes
			8.6(B) <i>model the relationship between the volume of a cylinder and a cone having both congruent bases and heights and connect that relationship to the formulas</i>
		8.5(D) use a trend line that approximates the linear relationship between bivariate sets of data to make predictions	8.5(C) contrast bivariate sets of data that suggest a linear relationship with bivariate sets of data that do not suggest a linear relationship from a graphical representation
		8.12(D) calculate and compare simple interest and compound interest earnings	8.11(A) construct a scatterplot and describe the observed data to address questions of association such as linear, non-linear, and no association between bivariate data
			8.11(B) determine the mean absolute deviation and use this quantity as a measure of the average distance data are from the mean using a data set of no more than 10 data points
			8.12(A) solve real-world problems comparing how interest rate and loan length affect the cost of credit
			8.12(C) explain how small amounts of money invested regularly, including money saved for college and retirement, grow over time
			8.12(G) estimate the cost of a two-year and four-year college education, including family contribution, and devise a periodic savings plan for accumulating the money needed to contribute to the total cost of attendance for at least the first year of college
		8.11(C) <i>simulate generating random samples of same size from a population with known characteristics to develop the notion of a random sample being representative of the population from which is was selected</i>	
		8.12(B) <i>calculate the total cost of repaying a loan, including credit cards and easy access loans, under various rates of interest over different periods using an online calculator</i>	
		8.12(E) <i>identify and explain the advantages and disadvantages of different payment methods</i>	
		8.12(F) <i>analyze situations to determine if they represent financially responsible decisions and identify the benefits of financial responsibility and the costs of financial irresponsibility</i>	
# Items	56 (4 Griddable)	34-36 questions from Readiness Standards	20-22 questions from Supporting Standards