

I Can... Grade 8

EOY—End of Year Assessment PBA—Performance-Based Assessment

Major Content Supporting Content Additional Content



I don't yet know it.
I need help from my teacher.
I sometimes need help.
I can do this all by myself.
I can teach this.

I Can...		Example					
Number System	1 I can know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number	Convert from decimal to rational.4.25.					
	2 I can use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions	π^2					
Expressions & Equations	1 I can know and apply the properties of integer exponents to generate equivalent numerical expressions.	$3^2 \times 3^{-5} = \frac{1}{3^3} = \frac{1}{27}$					
	2 I can use square root and cube root symbols to represent solutions to equations of the form $x^2=p$ and $x^3=p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes.	Find the length of one side of a square whose area is 36 inches					

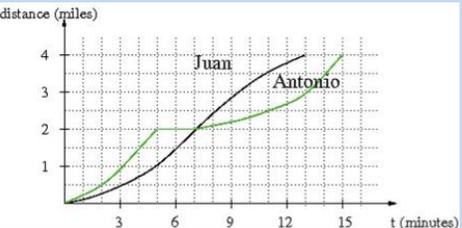
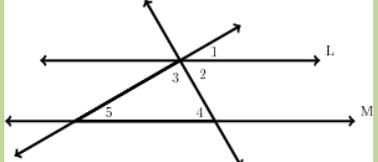
Unit	I Can...	Example	Red	Orange	Yellow	Green	Blue
Expressions & Equations	3 I can use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.	Estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.					
	4-1 I can perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used.	The world is consuming approximately 87 million barrels of oil per day. At this rate of consumption, how long will the known world oil reserves of 1.6355×10^{12} barrels last?					
	4-2 I can use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.	Use millimeters per year for seafloor spreading.					
	5-1 I can graph proportional relationships, interpreting the unit rate as the slope of the graph.	Explain why the descriptions “right 5 up 2”, “right 10 up 4”, “left 5 down 2”, “right 5/2 up 1”, and “left 1 down 2/5” all describe the same inclination for a straight line					
	5-2 I can compare two different proportional relationships represented in different ways.	Compare a distance-time graph to a distance-time equation to determine which of two moving objects has a greater speed.					
	6-1 I can use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane.	Find the slope of the line containing the points (4, 7) and (6, 11). Find coordinates for another point that lies on the same line and be prepared to discuss the method you used to find them.					

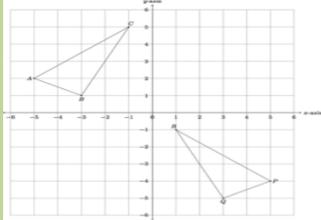
Grade 8

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	<p>7b I can solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.</p>	<p>Solve the following for x: $4 - (x+3) = 8 - 5(2x - 3)$</p>					
	<p>8a I can understand that solutions to a system of two linear equations in two variables correspond to points of intersections of their graphs, because points of intersection satisfy both equations simultaneously.</p>	<p>Do the equations $y = 2x + 3$ and $x = 1 - 2y$ have one common solution, no common solutions, or infinitely many common solutions? Explain how you know.</p>					
	<p>8b-1 I can solve systems of two linear equations in two variables algebraically.</p>	<p>Consider the equation $5x-2y = 3$. If possible, find a second linear equation to create a system of equations that has exactly 1 solution.</p>					

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	<p>8b-2 I can estimate solutions [to systems of two linear equations in two variables] by graphing the equations.</p>	<p>The graph shows the earnings for Kimi and Jordan over a week in relation to the number of hours worked.</p> <p>Estimate when Kimi and Jordan had earned the same amount of money? About how many hours did they both need to work? Explain how you determined your answer.</p>					
	<p>8b-3 I can solve simple cases [of systems of two linear equations in two variables] by inspection.</p>	<p>$3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.</p>					
	<p>8c I can solve real-world and mathematical problems leading to two linear equations in two variables.</p>	<p>Given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.</p>					

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Functions	1-1 I can understand that a function is a rule that assigns to each input exactly one output.	Could the set of ordered pairs, (2, 5), (3, 5), (4, 6), (2, 8), (6, 7) describe the number of seconds since you left home and the number of meters you've walked? Is this a function? Justify your answer.					
	1-2 I can [Understand that] the graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	Does the set of students in the classroom and their birthdays represent a function? Justify your answer.					
	2 I can compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	Given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greatest rate of change.					
	3-1 I can interpret the equation, $y=mx + b$ as defining a linear function, whose graph is a straight line.	The function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.					
	3-2 I can give examples of functions that are not linear and prove that they are not linear.	Give two examples of linear functions. Why are they called linear?					
	4 I can construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	You have \$100 to spend on a barbecue where you want to serve chicken and steak. Chicken costs \$1.29 per pound and steak costs \$3.49 per pound. (a) Write a function that relates the amounts of chicken and steak you can buy. (b) Graph the function you wrote in part (a). What is the meaning of each intercept in this context? What is the meaning of the slope? (c) Use your graph, the information in part (b), and any other information from the equation and graph, to discuss what your options are for the amounts of chicken and steak you can buy for the barbecue.					

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	<p>5-1 I can describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear).</p>	<p>Antonio and Juan are in a 4-mile bike race. The graph below shows the distance of each racer (in miles) as a function of time (in minutes). Who wins the race? How do you know?</p> 					
	<p>5-2 I can sketch a graph that exhibits the qualitative features of a function that has been described verbally.</p>	<p>Pat and Kim are walking in the same direction along Front Street at a rate of 4 mph. Pat started from the Library at 8 am, and Kim left from the same spot 15 minutes later. Draw a graph that plots Pat's distance from the Library versus time.</p>					
<p>Geometry</p>	<p>1a I can verify experimentally the properties of rotations, reflections, and translations: a. Lines are taken to lines, and line segments to line segments of the same length.</p>	<p>Triangle ABC has coordinates A (-2, -2) B (-6, -6) C (-4, 5). The triangle is translated 6 right and 2 down. What are the coordinates of the new triangle?</p> <p>What is the relationship between segment AB and A'B'? Prove your claim using mathematics.</p>					
	<p>1b I can verify experimentally the properties of rotations, reflections, and translations: b. Angles are taken to angles of the same measure.</p>	<p>Triangle ABC has coordinates A (-2, -2) B (-6, -6) C (-4, 5). The triangle is translated 6 right and 2 down. What are the coordinates of the new triangle?</p> <p>What is the relationship between $\angle C$ and $\angle C'$? Prove your claim using mathematics.</p>					
	<p>1c I can verify experimentally the properties of rotations, reflections, and translations: c. Parallel lines are taken to parallel lines.</p>	<p>Line L and Line M are parallel. Show that $m\angle 3 + m\angle 4 + m\angle 5 = 180^\circ$.</p> 					

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	<p>2 I can understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.</p>	<p>Triangles ABC and PQR are shown below in the coordinate plane: Show that $\triangle ABC$ is congruent to $\triangle PQR$ with a reflection followed by a translation.</p> 					
	<p>3 I can describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.</p>	<p>Triangle ABC has coordinates A (-2,1) B (2,6) C (-9,6). The triangle is reflected over the y-axis. What are the coordinates of the new triangle?</p>					
	<p>4 I can understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.</p>	<p>Which of the following transformations will result in a similar figure? A) $(3x, 2y)$ B) $(-x + 2, y-2)$, C) $(5x, y + 5)$ D) $(3x, x + y)$</p>					
	<p>7-1 I can apply the Pythagorean Theorem in a simple planar case.</p>	<p>A football field is a rectangle, 300 feet long (from goal to goal) and 160 feet wide (from sideline to sideline). To the nearest foot, how far is it from one corner of the field (on one of the goal lines) to the furthest corner of the field (on the other goal line)?</p>					
	<p>7-2 I can apply the Pythagorean Theorem in a simple three-dimensional case.</p>	<p>Fearless Frames Inc. makes metal frames for containers. (a) A client asks Fearless Frames to make a large container that is a rectangular prism with a square cross section. The company has only 60 meters of suitable metal tubing in stock. Find the dimensions of the largest possible container (maximum volume) that the company can make using 60 meters of tubing.</p>					

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	8 I can apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	What is the distance from the point (4,2) to the point (-3,-2)? Be prepared to explain your method.					
	9 I can know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	Bruce Wayne is playing outside when he discovers a cylindrical well about 5 feet across. Bruce is not sure how deep it is, so he decides to get a hose and fill it up. Bruce's hose can deliver 100 cubic feet of water every hour. How many vertical feet would Bruce fill in one hour?					
Statistics & Probability	1 I can construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	The table at right shows data that Morgan collected during a 10-mile bike ride that took 50 minutes. The cumulative distance (measured in miles) is tabled at ten-minute intervals. Make a scatter plot of this data. Why might you expect the data points to line up? Why do they not line up?					
	2 I can know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	Population data for Vermont is given in the table at right. Find the average annual growth rate of this population during the time interval from 1970 to 2010. Write an equation for a line in point-slope form, using the ordered pair (1970, 448327) and the slope you found in part (a)					
	3 I can use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.	In a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.					
	4 I can understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects	Collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?					