

2021 STAAR Grade 5 Math Rationales

Item#	Rationale	
1	Option A is correct	To determine the amount of money Kelsi spent on breakfast for 14 Saturdays, the student could have multiplied 6.75 by 14 ( $6.75 \times 14 = 94.50$ ). The student should have determined that multiplying 675 (6.75 without the decimal point) by 14 results in an answer of 9,450. To determine the placement of the decimal point, the student should have added the number of digits to the right of the decimal point in 6.75 (two) and 14 (zero) and then counted that total number of digits (two) from the right of 9,450 to place the decimal point in the answer (94.50). This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option B is incorrect	The student likely added the two given values of 6.75 and 14 ( $6.75 + 14 = 20.7575$ )

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2	Option J is correct	The student should have determined that the graph with points located at (1, 3.5), (2, 7), (3, 10.5), and (4, 14) best represents the ordered pairs in the table. The student should have determined that the $x$ -value (presented in the left-hand column of the table) represents the horizontal distance to the right from zero, and the $y$ -value (presented in the right-hand column of the table) represents the vertical distance up from the $x$ -value.
	Option F is incorrect	The student likely rounded the $x$ -values that were not whole numbers (3.5 and 10.5) and then reversed the $x$ -values and $y$ -values. The student needs to focus on understanding how to graph points on the coordinate plane with accuracy.
	Option G is incorrect	The student likely rounded the $x$ -values that were not whole numbers (3.5 and 10.5). The student needs to focus on understanding how to graph points on the coordinate plane with accuracy.
	Option H is incorrect	The student likely reversed the $x$ -values and $y$ -values. The student needs to focus on understanding how to graph points on the coordinate plane with accuracy.

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Item#	Rationale	
3	Option A is correct	To determine which equation can be used to find the number of bags the teachers can fill with glue sticks ( ), the student should have identified an equation where the number of boxes of glue sticks (90) and the number of glue sticks in each box (36) are multiplied together. Then the result is divided by 6 to represent the number of glue sticks that are put into each bag.
	Option B is incorrect	The student likely chose an equation in which the number of boxes of glue sticks (90) was divided by the number of glue sticks put into each bag (6) and then added 36 (the number of glue sticks in each box) to the result. The student did not realize that the number of boxes of glue sticks (90) should be multiplied by the number of glue sticks in each box (36) before dividing by 6. The student needs to focus on understanding how a number in a problem situation is related to the other numbers in the problem situation and the mathematical operations (+, −, ×, ÷) that are required to solve the problem.
	Option C is incorrect	The student likely chose an equation in which the total number of glue sticks put into each bag (6) is added to the total number of glue sticks (36 × 90). The student did not realize that the total number of glue sticks should be divided by 6 instead of 6 being added. The student needs to focus on



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5	Option C is correct	To determine the number of boxes Nicholas needed for the baseball cards, the student should have divided the number of baseball cards by the number of cards he put in each box ( $1,012 \div 22 = 46$ ).
	Option A is incorrect	The student likely divided 1,012 by 22 but miscalculated the first digit of the quotient (answer) to be 5 instead of 4. The student then subtracted the smaller digit from the larger digit in the first step ( $101 - 110 = 11$ ). The student likely performed the rest of the division algorithm (procedure) correctly but disregarded the remainder, resulting in 55. The student needs to focus on understanding how to carry out all the steps in the division algorithm with accuracy.
	Option B is incorrect	The student likely rounded 1,012 to 1,000 and 22 to 20 before dividing. The student needs to focus on understanding when a problem situation requires an exact solution instead of an estimated solution.
	Option D is incorrect	The student likely divided 1,012 by 22 using the division algorithm (procedure) incorrectly.

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Item#	Rationale	
6	13.61 and any equivalent values are correct	The student should have used place value to determine the mass of the ice chest. From left to right for this number, the place value is tens, ones, decimal point, tenths place, hundredths place. The student should have used a 1 in the tens place ( $1 \times 10$ ), a 3 in the ones place ( $3 \times 1$ ), a 6 in the tenths place ( $6 \times 0.1$ ), and a 1 in the hundredths place ( $1 \times 0.01$ ), resulting in 13.61.

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Item#	Rationale	
7	Option B is correct	To determine which table represents the rule $y = x + 5$ , the student should have identified that each $y$ -value in the table is the result of adding 5 to each corresponding (paired) $x$ -value in the table ( $4 + 5 = 9$ ; $5 + 5 = 10$ ; $6 + 5 = 11$ ; and $7 + 5 = 12$ ).
	Option A is incorrect	The student likely reversed the $x$ - and $y$ -values using the rule $y = x + 5$ . The student needs to focus on understanding equations and evaluating them accurately to generate corresponding $x$ - and $y$ -values.
	Option C is incorrect	The student identified a table in which each $y$ -value is the result of adding 5 to the previous $x$ -value ( $15 = 10 + 5$ ; $20 = 15 + 5$ ; $25 = 20 + 5$ ). The student needs to focus on understanding how paired $x$ - and $y$ -values are arranged in a table to represent a numerical pattern.
	Option D is incorrect	The student identified a table in which each $y$ -value is the result of multiplying 5 to the corresponding $x$ -value instead of adding 5. The student needs to focus on understanding equations and evaluating them accurately to generate corresponding $x$ - and $y$ -values.

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Item#	Rationale	
8	Option J is correct	To determine which triangle belongs in the intersection of "Acute triangles" (triangles that have three angle measures less than 90 degrees) and "Isosceles triangles" (triangles that each have at least two sides of equal length), the student should have used the hash marks on the sides of each triangle. Because sides of a triangle that are marked with the same number of hash marks indicate sides of equal length, the triangle in option D is the only triangle with three angle measures less than 90 degrees and at least two sides of equal length.
	Option F is incorrect	The student likely confused acute triangles with right triangles (triangles with one right angle (90-degree angle)) and identified a triangle that is both a right triangle and an isosceles triangle. The student needs to focus on understanding triangle classifications and their definitions.
	Option G is incorrect	The student likely confused isosceles triangles with scalene triangles (triangles with three different side lengths and three different angle measures) as well as acute angles (angles that measure less than 90 degrees) with obtuse angles (angles that measure more than 90 degrees) and identified a triangle that is both a scalene triangle and an obtuse triangle (a triangle that has one angle measure that is between 90 and 180 degrees). The student needs to focus on understanding triangle classifications and their definitions.
	Option H is incorrect	The student likely confused acute angles (angles that measure less than 90 degrees) with obtuse angles (angles that measure more than 90 degrees) and identified a triangle that is both an isosceles triangle and an obtuse triangle (a triangle that has one angle measure that is between 90 and 180 degrees). The student needs to focus on understanding triangle classifications and their definitions.



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Item#	Rationale	
10	Option J is correct	<p>To determine how many gallons of fruit punch Ms. Fitzgerald had left after lunch, the student could have subtracted <math>2\frac{1}{4} - \frac{3}{8}</math> by first finding the least common denominator (bottom number) (8), multiplying both the numerator (top number) and the denominator of <math>\frac{1}{4}</math> by 2 to get <math>\frac{2}{8}</math>. Since <math>\frac{3}{8}</math> cannot be subtracted from <math>\frac{2}{8}</math>, the student should have regrouped 1 whole as <math>\frac{8}{8}</math>, added <math>1\frac{8}{8} + \frac{2}{8}</math>, and then calculated <math>\text{---} - \text{---} - \text{---}</math></p>

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Item#	Rationale	
	Option H is incorrect	<p>The student likely subtracted the fractions by subtracting the numerators and subtracting the denominators <math>\left( \frac{1}{4} - \frac{3}{8} \rightarrow \frac{3-1}{8-4} = \frac{2}{4} \right)</math>. Then the student reduced <math>1\frac{2}{4}</math> to simplest terms by dividing the numerator by 2 and the denominator by 2 to get <math>1\frac{1}{2}</math> <math>\left( 1\frac{2 \div 2}{4 \div 2} = 1\frac{1}{2} \right)</math>. The student needs to focus on understanding how to perform arithmetic with fractional expressions.</p>



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Item#	Rationale	
12	Option F is correct	<p>To determine how much soil Angelina used to fill each flowerpot, the student should have divided <math>\frac{1}{3}</math> by 6. Using the standard algorithm (procedure), the number 6 would be considered a fraction with a denominator (bottom number) of 1   <math>\frac{6}{1}</math>  . Then (the student should have determined that <math>\frac{1}{3}</math> divided by <math>\frac{6}{1}</math> is equal to <math>\frac{1}{3}</math> multiplied by <math>\frac{6}{1}</math> inverted (flipped upside down)   <math>\frac{1}{3} \div \frac{6}{1} = \frac{1}{3} \times \frac{1}{6} = \frac{1}{18}</math>  .) This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.</p>
	Option G is incorrect	<p>The student likely inverted <math>\frac{1}{3}</math> and then multiplied — <math>\frac{1}{3}</math> —  </p>




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Item#	Rationale	
14	Option H is correct	Each square in the hundreds model represents one-hundredth (0.01). Since each row and each column contains 10 squares, each row and column represents 10/100





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Item#	Rationale	
16	Option G is correct	To determine the mass in kilograms of meat in each lunch, the student should have divided the number of kilograms of meat used (8.05) by the number of lunches made (35), resulting in 0.23 kg of meat in each lunch ( $8.05 \div 35 = 0.23$ ).
	Option F is incorrect	The student likely divided correctly but placed the decimal in the wrong place in the quotient (answer). The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure).
	Option H is incorrect	The student likely divided correctly but placed the decimal in the wrong place in the quotient (answer). The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure).
	Option J is incorrect	The student likely divided correctly but placed the decimal in the wrong place in the quotient (answer). The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure).

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Item#	Rationale	
17	Option B is correct	To determine which number can be placed in the box to show the numbers in order from greatest to least, the student should <b>J U H D W H D €</b>



Item#	DURP	Rationale
19	<p>Option D is correct</p> <p>the addition step H S</p>	<p>To determine the value of the expression, the student should have used the order of operations, or PEMDAS. The student should have completed the operations in this order: 1. Operations contained in <u>P</u>arentheses or brackets, 2. <u>E</u>xponents (numbers raised to a power), 3. <u>M</u>ultiplication/<u>D</u>ivision from left to right, and 4. <u>A</u>ddition/<u>S</u>ubtraction from left to right. The student first should have performed the addition step within the parentheses ( to have</p>

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Item#	Rationale	
20	Option H is correct	To determine which figures have a volume (amount of three-dimensional space taken up) of 12 cubic units, the student should have _____ ts, _____ path 12 cubic _____ y _____ f0

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Item#	Rationale	
21	Option A is correct	To determine the amount of money in dollars Kendra earned for each ring sold, the student should have used the order of operations, or PEMDAS. The student should have completed the operations in this order: 1. Operations contained in <u>P</u> arentheses or brackets, 2. <u>E</u> xponents (numbers raised to a power), 3. <u>M</u> ultiplication/ <u>D</u> ivision from left to right, and 4. <u>A</u> ddition/ <u>S</u> ubtraction from left to right. The student should have first performed the multiplication step within the parentheses ( $7 \times 55 = 385$ ). Second the student should have subtracted ( $625 - 385 = 240$ ). Then the student should have divided 240 by 8, resulting in 30.
	Option B is incorrect	The student likely performed all the calculations correctly inside the parentheses and brackets but disregarded the final division step. The student needs to focus on completing all steps correctly when calculating the value of an expression using the order of operations.
	Option C is incorrect	The student likely performed all the calculations in the correct order but in the second step, subtracted the smaller digit from the larger digit in the tens place (8 minus 2), resulting in 360. The student needs to focus on completing all steps correctly when calculating the value of an expression using the order of operations.
	Option D is incorrect	The correct answer (30) was presented in one of the other answer options.

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Item#	Rationale	
22	192 and any equivalent values are correct	<p>To determine the area of (amount of space covered by) the deck Edgar built in square feet, the student should have found the area of the rectangle and the square separately before adding the values together. First the student should have multiplied the length of the rectangle (16 ft) by the width of the rectangle (8 ft) (<math>16 \times 8 = 128</math>). Then the student should have multiplied the length of the square (8 ft) by the width of the square (8 ft) (<math>8 \times 8 = 64</math>). To find the total area of the deck, the student should have added the products together (<math>128 + 64</math>), resulting in an area of 192 square feet.</p>

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Item#	Rationale	
23	Option C is correct	To determine which prime number is missing from Jaylen's list, the student should have identified a number that can be divided evenly only by 1 and the number itself. The student should have chosen 43 because the number 43 only has two numbers that it can be divided by (1 and itself, 43).
	Option A is incorrect	The student likely chose 49 because it is an odd number (number that cannot be divided by 2 evenly). It is not a prime number because it is divisible by 1, 7, and 49. The student needs to focus on understanding the difference between prime numbers and odd numbers.
	Option B is incorrect	The student likely chose 39 because it is an odd number (number that cannot be divided by 2 evenly). It is not a prime number because it is divisible by 1, 3, 13, and 39. The student needs to focus on understanding the difference between prime numbers and odd numbers.
	Option D is incorrect	The student likely chose 33 because each of its digits alone is a prime number or because it is an odd number (number that cannot be divided by 2 evenly). It is not a prime number because it is divisible by 1, 3, 11, and 33. The student needs to focus on understanding the definition of a prime number and the difference between prime numbers and odd numbers.



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Item#	Rationale	
24	Option J is correct	To determine the length of each piece of



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Item#	Rationale	
26	Option F is correct	To determine which table contains only -values and -values th tV À W 1 f P) L0Æy #q!g9—€™xV

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Item#	Rationale	
27	Option D is correct	To determine what Spencer can do so that his budget is balanced, the student should have first calculated the total income and the total expenses. To determine the total income, the student should have added $40 + 30 = 70$ , and to determine the total expenses, the student should have added $15 + 25 + 30 + 10 = 80$ . Since the expenses are \$10 more than the income ( $80 - 70 = 10$ ), the student should have identified an option that would either increase his total income by \$10 or decrease his total expenses by \$10. The student should have determined that decreasing Spencer's entertainment costs by \$10 would decrease expenses and balance his budget.
	Option A is incorrect	The student likely associated savings with income and chose an option that increases Spencer's expenses instead of reducing them. The student needs to focus on understanding the descriptions of the relationships between expenses and income.
	Option B is incorrect	The student likely focused on increasing income but did not notice that the \$5 increase in allowance would not be enough to balance Spencer's budget. The student needs to focus on understanding the descriptions of the relationships between expenses and income.
	Option C is incorrect	The student likely focused on decreasing expenses but did not notice that the \$5 decrease in piano lessons would not be enough to balance Spencer's budget. The student needs to focus on understanding the descriptions of the relationships between expenses and income.



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Item#	Rationale	
29	Option A is correct	To identify the term that best classifies the shapes that belong in the shaded section of the organizer, the student should have determined that Rectangles (parallelograms that have four right angles), Rhombuses (parallelograms that have all sides the same length), and Squares (parallelograms with four right angles and all sides the same length) are subsets of Parallelograms (quadrilaterals with opposite sides parallel) and that Parallelograms are a subset of Quadrilaterals (figures that have four sides).
	Option B is incorrect	The student likely misunderstood the diagram and identified Polygon (closed figure that has at least three sides) because Quadrilaterals are a subset of Polygons. The student needs to focus on understanding the characteristics of quadrilaterals.
	Option C is incorrect	The student likely thought Pentagon (figure that has five sides) was a subset of Quadrilaterals. The student needs to focus on understanding the characteristics of quadrilaterals.
	Option D is incorrect	The correct answer (Parallelogram) was presented in one of the other answer options.

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Item#	Rationale	
31	Option D is correct	To determine how much money Amelia has for other expenses, the student should have recognized that in order for the budget to be balanced, all expenses must add up to Amelia's net income for the month (2,135). The student should have first added the amount spent on expenses (food, rent, and savings) ( $400 + 850 + 150 = 1,400$ ). The student then should have determined that the amount spent on "Other" is \$735 because $2,135 - 1,400 = 735$ .
	Option A is incorrect	The student likely found the total amount spent on expenses but added the total to the net income instead of subtracting. The student needs to focus on understanding how to use a budget to balance income and expenses.
	Option B is incorrect	The



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Item#	Rationale	
32	Option G is correct	To determine the best estimate for the amount of money Shane spent, the student could have rounded each value to the nearest dollar. When rounded to the nearest dollar, the numbers are as follows: \$15.45 rounds to \$15, \$21.99 rounds to \$22, and \$12.15 rounds to \$12. Then the student should have added the rounded amounts, resulting in \$49 ( $15 + 22 + 12 = 49$ ). The answer choice of \$50 is closest to \$49. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option F is incorrect	The student likely <b>estimated incorrectly</b> that \$15.45 is about \$10, \$21.99 is about \$20, and \$12.15 is about \$10. The student then likely calculated the total cost ( $10 + 20 + 10 = 40 =$

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Item#	Rationale	
33	Option A is correct	To determine which expression has a value of 25, the student should have used the order of operations, or PEMDAS. The student should have completed the operations in this order: 1. Operations contained in <u>P</u> arentheses or brackets, 2. <u>E</u> xponents (numbers raised to a power), 3. <u>M</u> ultiplication/ <u>D</u> ivision from left to right, and 4. <u>A</u> ddition/ <u>S</u> ubtraction from left to right. First the student should have performed the addition step within the parentheses ( $32 + 18$ ), resulting in 50. Then the student should have multiplied 2 by 50, resulting in 100. Finally the student should have divided 100 by 4, resulting in 25.
	Option B is incorrect	The student likely performed the operations from left to right ( $10 \times 10 = 100$ , $100 \div 2 = 50$ , and $50 \div 2 = 25$ ). The student needs to focus on understanding how to perform the order of operations.
	Option C is incorrect	The student likely confused the operations of multiplication and division ( $50 \div 10 = 5$ and $5 \times 5 = 25$ ). The student needs to focus on attending to the details of problems using mathematical operations (+, -, $\times$ , $\div$ ).
	Option D is incorrect	The student likely confused multiplication with addition when calculating ( $10 \times 10 = 100$ and $100 \div 4 = 25$ ). The student needs to focus on attending to the details of problems using mathematical operations (+, -, $\times$ , $\div$ ).

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Item#	Rationale	
34	Option G is correct	To determine the total number of pieces after Harriett cut the cakes, the student should have interpreted "equal-size pieces" to mean division into equal parts. The student could have determined that 3 divided by

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Item#	Rationale	
35	Option B is correct	To determine the total number of minutes read by the students who have participated in the book club for 4 or 5 years, the student should have added the data point values from the scatterplot graph of 4 years (70 and 80) and 5 years (70, 80, and 90), concluding <del>that</del>

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Item#	Rationale	
36	Option H is correct	To determine the length of string in meters that Landon had left, the student should have subtracted the length of the string used for a project from the total length of the string ( $10 - 6.275 = 3.725$ ).
	Option F is incorrect	The student likely added the two values instead of subtracting the values.