Item #	Rationale	
1	Option B is correct	To determine the total amount of money collected from the book sale, the student could have multiplied the number of books, 681, by the price of each book, $0.50. This results in a product (the result of a multiplication problem) of $340.50. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely did not regroup when performing multiplication steps. The student needs to focus on attending to the details of problems that involve multiplication and understanding how to carry out all the steps in the multiplication algorithm.
	Option C is incorrect	The student likely did not regroup when performing multiplication steps and placed the decimal point in the product incorrectly. The student needs to focus on attending to the details of problems that involve multiplication and understanding how to carry out all the steps in the multiplication algorithm.
	Option D is incorrect	The student likely multiplied the number of books, 681, by $0.05. The student needs to focus on attending to the details of problems that involve multiplication and understanding how to carry out all the steps in the multiplication algorithm.

Item #	Rationale	
2	Option A is correct	To determine the value of the expression, the student should have used the order of operations (represented by acronyms such as PEMDAS). The student should have completed the operations in this order: (1) operations contained in Parentheses or brackets, (2) Exponents (the number of times a number is multiplied by itself), (3) Multiplication/ Division from left to right, and (4) Addition/Subtraction from left to right. First, the student should have performed the subtraction step within the parentheses (36 – 3 = 33). Second, the student should have performed the multiplication step (33 × 4 = 132). Finally, the student should have compared the result to 24, recognizing that 132 does not equal 24.
	Option B is incorrect	The student likely performed the operations in order from left to right without regard for the parentheses (2 × 8 = 16; 16 + 4 = 20). The student needs to focus on understanding how to use the order of operations and how to simplify numerical expressions that do not involve exponents, including up to two levels of grouping.
	Option C is incorrect	The student likely performed the operations in order from left to right without regard for the parentheses (96 ÷ 12 = 8; 8 – 8 = 0). The student needs to focus on understanding how to use the order of operations and how to simplify numerical expressions that do not involve exponents, including up to two levels of grouping.
	Option D is incorrect	The student likely performed the operations using the order of operations without regard for the parentheses (8 ÷ 2 = 4; 40 + 4 = 44). The student needs to focus on understanding how to use the order of operations and how to simplify numerical expressions that do not involve exponents, including up to two levels of grouping.

Item #	Rationale	
3	Option B is correct	To determine the difference between the height of the tallest student and the height of the shortest student, the student should have analyzed the stem and leaf plot, looking for the minimum and maximum values. Using the key "5|4 means 54 inches" to interpret the meaning of the stems (which represent the tens place) and leaves (which represent the ones place), the student should have determined that the minimum value (the shortest student) was 52 inches and the maximum value (the tallest student) was 62 inches. Then the student should have subtracted the height of the shortest student from the height of the tallest student: (62 – 52 = 10).
	Option A is incorrect	The student likely found the difference between the first values of the two stems, 52 and 60: (60 – 52 = 8). The student needs to focus on solving one- and two-step problems using data from a stem and leaf plot.
	Option C is incorrect	The student likely found the difference between the greatest value from the first stem, 57, and the least value from the second stem, 60: (60 – 57 = 3). The student needs to focus on solving one- and two-step problems using data from a stem and leaf plot.
	Option D is incorrect	The student likely found the difference between the greatest values of the two stems, 57 and 62: (62 – 57 = 5). The student needs to focus on solving one- and two-step problems using data from a stem and leaf plot.

Item #	Rationale	
4	Option C is correct	To determine the value of each expression, the student should have used place value (the value of a digit depending on its place in a number). The student should have chosen the number 275.369, which has a 7 in the tens place (7 × 10), a 3 in the tenths place (3 × 0.1), and a 9 in the thousandths place (9 × 0.001).
	Option A is incorrect	The student likely confused the tens place value with the hundreds place value. The student needs to focus on using place value to read and write using numerals and expanded notation.
	Option B is incorrect	The student likely confused the tenths place value with the hundredths place value. The student needs to focus on using place value to read and write using numerals and expanded notation.
	Option D is incorrect	The student likely confused the thousandths place value with the hundredths place value. The student needs to focus on using place value to read and write using numerals and expanded notation.

Item #	Rationale	
5	Option B is correct	To determine the value of *n*, the student should have used the order of operations (represented by acronyms such as PEMDAS). The student should have completed the operations in this order: (1) operations contained in Parentheses or brackets, (2) Exponents (the number of times a number is multiplied by itself), (3) Multiplication/Division from left to right, and (4) Addition/Subtraction from left to right. The student should have first performed the division step (1,368 ÷ 18), resulting in 76. Second, the student should have added 76 + 1, resulting in 77.
	Option A is incorrect	The student likely added before dividing (18 + 1 = 19; 1,368 ÷ 19 = 72). The student needs to focus on using the order of operations correctly to solve the equation.
	Option C is incorrect	The student likely did not complete all steps of the equation, completing only the division and not the addition (1,368 ÷ 18 = 76). The student needs to focus on using the order of operations correctly to solve the equation.
	Option D is incorrect	The student likely subtracted instead of dividing (1,368 – 18 = 1,350; 1,350 + 1 = 1,351). The student needs to focus on using the order of operations correctly to solve the equation.

Item #	Rationale	
6	Option D is correct	To determine which table best represents the data shown in the graph, the student should have determined that the table with the ordered pairs (2, 50), (4, 100), and (6, 150) best represents the ordered pairs in the graph. The student should have determined that the *x*-value (presented in the first row of the table, Number of Bags) represents the horizontal distance to the right from zero, and the *y*-value (presented in the second row of the table, Charge (dollars)) represents the vertical distance up from the *x*-value.
	Option Ais incorrect	The student likely misinterpreted the values between the labeled increments as units of 10 instead of 20 and reversed the meaning of the *x*-value and the meaning of the *y*-value. The student needs to focus on graphing ordered pairs of numbers in the first quadrant of the coordinate plane.
	Option B is incorrect	The student likely misinterpreted the values between the labeled increments as units of 10 instead of 20. The student needs to focus on graphing ordered pairs of numbers in the first quadrant of the coordinate plane.
	Option C is incorrect	The student likely reversed the meaning of the *x*-value and the meaning of the *y*-value. The student needs to focus on graphing ordered pairs of numbers in the first quadrant of the coordinate plane.

Item #	Rationale	
7	Option A is correct	To determine the value of the expression, the student should have divided $\frac{1}{8}$ by 4. Using the standard algorithm (procedure), the number 4 would be considered a fraction with a denominator (bottom number) of 1, $\frac{4}{1}$. Then the student could have determined that $\frac{1}{8}$ divided by $\frac{4}{1}$ is equal to $\frac{1}{8}$ multiplied by $\frac{1}{4}$. The resulting product is $\frac{1}{32}$. 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 multiplied $\frac{1}{8}$ by 4 instead of multiplying by $\frac{1}{4}$, resulting in $\frac{4}{8}$. Then the student reduced $\frac{4}{8}$ to simplest terms by dividing the numerator and the denominator by 4 to get $\frac{1}{2}$. The student needs to focus on understanding how to divide unit fractions by whole numbers.
	Option C is incorrect	The student likely inverted (reversed the numerator and denominator of) the whole number, 4, and then added the denominators $\left(\frac{1}{8}+\frac{1}{4}=\frac{1}{12}\right)$. The student needs to focus on understanding how to divide unit fractions by whole numbers.
	Option D is incorrect	The student likely inverted (reversed the numerator and denominator of) the fraction, $\frac{1}{8}$, before dividing, instead of inverting the whole number, 4: $\left(\frac{8}{1}\div\frac{4}{1}=\frac{2}{1}\right)$. The student needs to focus on understanding how to divide unit fractions by whole numbers.

Item #	Rationale	
8	Option D is correct	To determine which type of triangle always belongs in the shaded section, the student should have determined that equilateral triangles (triangles in which all three sides are equal length and all three angles are equal) always have three angles that each measure 60°. Therefore, equilateral triangles are a subset (set within a larger set) of acute triangles (triangles in which all three angles measure less than 90°).
	Option A is incorrect	The student likely thought the attributes of scalene triangles (triangles in which all three sides are different lengths and all three angles have different measures, one of which can be 90° or greater) allow them to be a subset of acute triangles. The student needs to focus on understanding the attributes of triangles and how they can be classified.
	Option B is incorrect	The student likely thought the attributes of right triangles (triangles with one angle that measures 90°) allow them to be a subset of acute triangles. The student needs to focus on understanding the attributes of triangles and how they can be classified.
	Option C is incorrect	The student likely thought the attributes of isosceles triangles (triangles with two equal sides and two equal angles) allow them to be a subset of acute triangles. The third angle in an isosceles triangle can be 90° or greater, so isosceles triangles are not a subset of acute triangles. The student needs to focus on understanding the attributes of triangles and how they can be classified.

Item #	Rationale	
9	$\frac{2}{3}, \frac{1}{6}$	To determine the subtraction expression that the model represents, the student should have determined that the model is divided into 3 equal-sized parts and that 2 of those 3 parts are shaded, representing $\frac{2}{3}$. Then the student should have identified that one section of $\frac{1}{3}$ was divided in half, creating a section of $\frac{1}{6}$. Finally, the student should have recognized that the model represents the expression $\frac{2}{3} - \frac{1}{6}$.

Item #	Rationale	
10	Option A is correct	To determine the width in meters of the rug, the student should have first identified that the perimeter of a rectangle is found by adding the four side lengths. Second, the student should have found the total of the missing side lengths (2.4 – 0.8 – 0.8 = 0.8). Last, the student should have divided the total of the missing side lengths by 2 to find the measurement of one missing side length (0.8 ÷ 2 = 0.4). 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 subtracted 0.8 from 2.4 and divided the result by 2. The student needs to focus on understanding how to solve problems related to perimeter.
	Option C is incorrect	The student likely confused perimeter with area (the space within the perimeter of a figure) and divided 2.4 by 0.8. The student needs to focus on understanding how to solve problems related to perimeter.
	Option D is incorrect	The student likely subtracted 0.8 from 2.4. The student needs to focus on understanding how to solve problems related to perimeter.

Item #	Rationale	
11	Option C is correct	To determine the greatest amount of money that the Pérez family can put into savings each month and still have a balanced budget, the student should have recognized that for the budget to be balanced, all expenses must add up to the family's net income for the month ($3,620). The student should have first added up the amount spent on expenses other than savings (house payment, utilities, food, entertainment, and car payment) (1,150 + 425 + 600 + 450 + 285 = 2,910). The student then should have determined that the amount the family can put into savings each month is the difference between the net income and the amount of the other expenses (3,620 – 2,910 = 710).
	Option A is incorrect	The student likely did not regroup to the tens place when adding the total monthly expenses shown in the budget (1,150 + 425 + 600 + 450 + 285 = 2,900). When subtracting to find the amount allocated for savings, the student likely solved 3,620 – 2,900. The student needs to focus on understanding how to add whole numbers.
	Option B is incorrect	The student likely rounded each value in the budget to the nearest hundred (1,200 + 400 + 600 + 500 + 300 = 3,000). The student then likely rounded the net income to 3,600 and solved 3,600 – 3,000. 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 subtracted 3,620 – 2,910 but subtracted the lesser digit in each place value from the greater digit in each place value (thousands: 3 – 2 = 1; hundreds: 9 – 6 = 3; tens: 2 – 1 = 1; ones: 0 – 0 = 0). The student needs to focus on understanding how to subtract whole numbers.

Item #	Rationale	
12	Option A is correct	To determine which model is shaded to represent $\frac{1}{3} \div 4$, the student should have identified a model that shows 1 whole divided into 3 parts. The student should have then identified one of the parts as having 4 sections. The student should have counted the number of parts (4) and counted the number of shaded pieces (1).
	Option B is incorrect	The student likely identified a model showing 1 whole divided into 12 parts, with 3 parts shaded. The student likely used the denominator (bottom number in a fraction) of 12 as a result of multiplying the denominator of 3 by the whole number 4. The student needs to focus on understanding how to represent division of a unit fraction by a whole number by using a pictorial model.
	Option C is incorrect	The student likely identified a model showing 1 whole divided into 4 parts instead of 3. The student likely then identified one of the parts as having 4 sections. The student then likely counted the number of parts (4) and counted the number of shaded pieces (1). The student needs to focus on understanding how to represent division of a unit fraction by a whole number by using a pictorial model.
	Option D is incorrect	The student identified a model showing 1 whole divided into 12 parts, with 3 parts shaded. The student likely used the denominator (bottom number in a fraction) of 12 as a result of multiplying the denominator of 3 by the whole number 4. The student needs to focus on understanding how to represent division of a unit fraction by a whole number by using a pictorial model.

Item #	Rationale	
13	Option C is correct	To determine which comparisons are true, the student should have used the values of the digits in the thousandths place. Both numbers have the same digits in the tens place (2), the ones place (3), and the tenths place (5), but 23.501 has a value in the thousandths place (1), whereas 23.5 has no number in the thousandths place and therefore has a value of 0. 23.501 is 0.001 greater than 23.5; therefore, 23.501 is greater than (>) 23.5.
	Option E is correct	To determine the other true comparison, the student should have used the values of the digits in the tenths place. Both numbers have the same digits in the tens place (3) and the ones place (7), but the digits in the tenths place (2 and 0) are different. Because 2 is greater than 0, 37.2 is greater than (>) 37.01.
	Option A is incorrect	The student likely mistook 7 hundredths as having a greater value than 7 tenths, which is equivalent to 70 hundredths. The student needs to focus on comparing and ordering decimals to the thousandths place.
	Option B is incorrect	The student likely compared the digits on the far right of the two numbers instead of comparing digits in the same place value, determining that 8 is greater than (>) 4. The student needs to focus on comparing and ordering decimals to the thousandths place.
	Option D is incorrect	The student likely compared the digits on the far right of each two numbers instead of comparing digits in the same place value, determining that 9 is greater than (>) 8. The student needs to focus on comparing and ordering decimals to the thousandths place.

Item #	Rationale	
14	Option D is correct	To determine how many watts each monitor uses, the student should have divided the total amount of electricity (0.87 watt) by the total number of computer monitors (3), resulting in 0.29 watt of electricity used per monitor (0.87 ÷ 3 = 0.29).
	Option A is incorrect	The student likely divided 0.87 by 3 but misplaced the decimal point in the quotient (answer to a division problem). The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure) with accuracy and focus on solving for quotients of decimals to the hundredths.
	Option B is incorrect	The student likely multiplied 0.87 by 3 and misplaced the decimal point in the product (answer to a multiplication problem). The student needs to focus on identifying when to use multiplication or division to solve problems involving decimals.
	Option C is incorrect	The student likely multiplied 0.87 by 3. The student needs to focus on identifying when to use multiplication or division to solve problems involving decimals.

Item #	Rationale	
15	Option B is correct	To determine the mass of the bag of sand in grams, the student should have referred to the units shown in the Weight and Mass section of the STAAR Grade 5 Mathematics Reference Materials page within the student's test booklet, finding that 1 kilogram (kg) = 1,000 grams (g). The student could have then multiplied the number of kilograms (22.7) by the kilograms-to-grams conversion factor (1,000), resulting in 22,700 grams. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely used a conversion factor of 10 instead of 1,000, resulting in 22.7 × 10, or 227 grams. The student needs to focus on understanding problem situations and attending to the details of problems that involve measurements and conversions.
	Option C is incorrect	The student likely used a conversion factor of 100 instead of 1,000, resulting in 22.7 × 100, or 2,270 grams. The student needs to focus on understanding problem situations and attending to the details of problems that involve measurements and conversions.
	Option D is incorrect	The student likely used a conversion factor of 0.01 instead of 1,000, resulting in 22.7 × 0.01, or 0.227 gram. The student needs to focus on understanding problem situations and attending to the details of problems that involve measurements and conversions.

Item #	Rationale	
16	1.75, 4.25	To determine which values complete the table to represent the relationship $y = 0.25x$, the student should have understood that the x-values should be multiplied by 0.25 to obtain the *y*-values. The student should have substituted the given *x*-values into the equation to solve for the missing *y*-values ($y = 0.25(7) = 1.75$ and $y = 0.25(17) = 4.25$).

Item #	Rationale	
17	+, ×	To determine an equation that represents *h*, the total number of baseball cards Gale buys, the student should have first identified that the number of packs of cards would be multiplied by the number of cards in each pack (3 × 64). Then that value would be increased by 8 to represent the initial purchase of one pack of 8 cards: 8 + 3 × 64.

Item #	Rationale	
18	Option C is correct	To determine which statements are true, the student should have read each statement. The student should have recognized that ordered pairs are written to describe first the *x*-coordinate (indicating left/right movement on the *x*-axis) and then the *y*-coordinate (indicating up/down movement on the *y*-axis). Statement I is true (point *S* is located on the horizontal axis). Point *S* is represented by the ordered pair (5, 0), indicating right movement of 5 units and upward movement of 0 units; therefore, Point *S* is located on the horizontal axis and is 5 units from the origin (0, 0). Statement III is also true (Point *N* is the same distance from the origin as point *S*). Point *N* is represented by the ordered pair (0, 5), indicating left/right movement of 0 units and upward movement of 5 units, which is 5 units from the origin. Statements I and III are true.
	Option A is incorrect	The student likely recognized Statement III as true but confused the vertical and horizontal axes to conclude that Statement I is false. The student needs to focus on attending to details in problems that involve coordinate grids.
	Option B is incorrect	The student likely misinterpreted the location of the origin. The student needs to focus on attending to details in problems that involve coordinate grids.
	Option D is incorrect	The student likely did not know the location of the origin. The student needs to focus on attending to details in problems that involve coordinate grids.

Item #	Rationale	
19	384.931 (or any value greater than 384.93 and less than 384.935)	To determine a number greater than 384.93 that also rounds to 384.93, the student should have first determined that the number would need to start with 384.93 as the base. The student then should have determined that the digit in the thousandths place (third to the right of the decimal point) will determine how the decimal will be rounded. Next, the student should have identified that the digits 0–4 in the thousandths place would maintain the digit 3 in the hundredths place and that the digits 5–9 would cause the digit 3 in the hundredths place to round up to a 4, which would invalidate rounding to the value 384.93. Finally, the student could have entered an answer of 384.931 or any value greater than 384.93 and less than 384.935. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item #	Rationale	
20	Option A is correct	To determine which shape most likely belongs in the intersection of Set A “Polygons (closed figures that have at least three sides) with at least one right angle (an angle that measures 90 degrees)” and Set B (quadrilaterals [four-sided figures]), the student should have determined what characteristics figures that belong in both Set A and Set B must have, which is that they must be quadrilaterals with at least one right angle. Option A is the only shape that has both characteristics.
	Option B is incorrect	The student likely identified a shape that satisfies only the characteristics of Set A (polygons with at least one right angle). The student needs to focus on understanding the characteristics of quadrilaterals and angle classifications.
	Option C is incorrect	The student likely identified a shape that satisfies the characteristics of Set A (polygons with at least one right angle) and a perceived characteristic of Set B, a slanted side. The student needs to focus on understanding the characteristics of quadrilaterals and angle classifications.
	Option D is incorrect	The student likely identified a shape that satisfies the characteristics of Set A (polygons with at least one right angle) and a perceived characteristic of Set B, a slanted side. The student needs to focus on understanding the characteristics of quadrilaterals and angle classifications.

Item #	Rationale	
21	Option C is correct	To determine how many cups of sugar were used, the student should have multiplied the number of cups of sugar, 1.5, by the number of batches of brownies, 3.5. This results in a product of 5.25 cups of sugar. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely did not carry the 1 after multiplying 5 by 3 when finding the product of 1.5 and 3.5. The student needs to focus on attending to the details of problems that involve multiplication and understanding how to carry out all the steps in the multiplication algorithm (procedure).
	Option B is incorrect	The student likely did not regroup numbers when multiplying the tenths place by the ones place and the ones place by the ones place. The student needs to focus on understanding how to regroup when carrying out the steps in the multiplication algorithm.
	Option D is incorrect	The student likely did not carry the 2 after multiplying 5 by 5 when finding the product of 1.5 and 3.5. The student needs to focus on attending to the details of problems that involve multiplication and understanding how to carry out all the steps in the multiplication algorithm.

Item #	Rationale	
22	Any two of the following points: (0, 0), (1, 2), (2, 4), (3, 6), (4, 8), (5, 10)	To determine which points fit the pattern, the student should have multiplied the chosen *x*-coordinate by 2 to determine the *y*-coordinate and then plotted two of those points on the graph. Any two of the following six pairs could have been plotted: (0, 0) because $0 \times 2 = 0$; (1, 2) because $1 \times 2 = 2$; (2, 4) because $2 \times 2 = 4$; (3, 6) because $3 \times 2 = 6$; (4, 8) because $4 \times 2 = 8$; and (5, 10) because $5 \times 2 = 10$.

Item #	Rationale	
23	an additive, increased by 18	To complete the statement about the pattern represented by the relationship between *x* and *y*, the student should have analyzed the relationship between each *x*-value and the corresponding (paired) *y*-value in the table. The student should have noticed that each *y*-value is 18 more than the corresponding *x*-value (6 + 18 = 24, 9 + 18 = 27, 15 + 18 = 33, 26 + 18 = 44). The pattern is additive because 18 is added to each *x*-value to get the corresponding *y*-value.

Item #	Rationale	
24	Option D is correct	To determine which classroom the principal will list second, the student could have ordered the classrooms from least to greatest area by comparing digits first at the tens place, then at the ones place, next at the tenths place, and finally at the hundredths place. All four numbers have a 9 in the tens place; therefore, this comparison does not distinguish any number as greater or less than the others. Two numbers (94.18 and 94.7) have a 4 in the ones place, whereas the remaining two (greater) numbers (95.13 and 95.2) have a 5 in the tens place. Looking at the tenths place, the student should have ordered 94.18 (Classroom X) first and 94.7 (Classroom Z) second because 0.18 is less than 0.70 (0.7 is equal to 0.70). Having ordered the first two values, the student could then have determined that Classroom Z would be second on the list from least to greatest. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely ordered the areas of the classrooms from greatest to least instead of from least to greatest. The student needs to focus on comparing and ordering decimals to the thousandths.
	Option B is incorrect	The student likely ordered Classrooms X and Z by using the digits after the decimal points as whole numbers instead of parts of a whole. The student likely concluded that 7 is less than 18 and therefore thought the area of Classroom Z was less than the area of Classroom X. The student needs to focus on comparing and ordering decimals to the thousandths.
	Option C is incorrect	The student likely ordered the areas of the classrooms from greatest to least instead of least to greatest and likely used the digits after the decimal points as whole numbers instead of parts of a whole. The student likely concluded that 2 is less than 13, and therefore thought the area of Classroom Y was less than the area of Classroom W. The student needs to focus on comparing and ordering decimals to the thousandths.

Item #	Rationale	
25	Option C is correct	To determine the total number of apple trees on the farm, the student should have multiplied the number of rows of trees by the number of trees in each row (127 × 53), resulting in the product (answer) of 6,731.
	Option A is incorrect	The student likely did not regroup after each multiplication step and instead regrouped when adding the two products. The student needs to focus on understanding how to regroup when carrying out the steps in the multiplication algorithm (procedure).
	Option B is incorrect	The student likely multiplied 127 by 3 correctly but did not use zero as a placeholder for the ones place in the second multiplication step, multiplying 127 by 5. The student needs to focus on understanding how to use placeholders of zero when carrying out the steps in the multiplication algorithm.
	Option D is incorrect	The student likely placed 53 above 127 and only used one placeholder zero (instead of two) when multiplying 53 by 100. The student needs to focus on understanding how to carry out the steps in the multiplication algorithm.

Item #	Rationale	
26	Option B is correct	To determine which numbers are composite, the student should have identified numbers that have more than two factors (numbers multiplied together to arrive at a product, or answer). Because 4 has factors of 1, 2, and 4, it is composite.
	Option D is correct	The other composite number is 22. Because 22 has factors of 1, 2, 11, and 22, it is composite.
	Option A is incorrect	The student likely confused composite numbers with odd numbers (numbers that cannot be divided by 2 evenly). The number 3 is not a composite number, because it can be divided only by 1 and itself and therefore does not have more than two factors. The student needs to focus on understanding the difference between composite numbers and odd numbers.
	Option C is incorrect	The student likely confused composite numbers with odd numbers. The number 19 is not a composite number, because it can be divided only by 1 and itself and therefore does not have more than two factors. The student needs to focus on understanding the difference between composite numbers and odd numbers.
	Option E is incorrect	The student likely confused composite numbers with odd numbers. The number 31 is not a composite number, because it can be divided only by 1 and itself and therefore does not have more than two factors. The student needs to focus on understanding the difference between composite numbers and odd numbers.

Item #	Rationale	
27	Option B is correct	To determine how many batches of cookies can be made using 12 teaspoons of salt, the student should have interpreted that 12 needed to be divided into equal parts of $\frac{1}{4}$. The student could have determined that 12 divided by $\frac{1}{4}$ is equal to 12 multiplied by the reciprocal of $\frac{1}{4}$, or $12 \div \frac{1}{4} = 12 \times \frac{4}{1} = 48$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely divided 12 by 4 instead of dividing 12 by $\frac{1}{4}$: $(12 \div 4 = 3)$. The student needs to focus on dividing whole numbers by unit fractions.
	Option C is incorrect	The student likely added 12 and 4 instead of dividing 12 by $\frac{1}{4}$: $(12 + 4 = 16)$. The student needs to focus on dividing whole numbers by unit fractions.
	Option D is incorrect	The student likely subtracted 4 from 12 instead of dividing 12 by $\frac{1}{4}$: $(12 - 4 = 8)$. The student needs to focus on dividing whole numbers by unit fractions.

Item #	Rationale	
28	Option D is correct	To determine the value of the expression, the student could have used the order of operations (represented by acronyms such as PEMDAS). The student should have completed the operations in this order: (1) operations contained in Parentheses or brackets, (2) Exponents (numbers raised to a power), (3) Multiplication/Division from left to right, and (4) Addition/Subtraction from left to right. First, the student should have performed the operations inside the brackets. With the brackets, the first operation to solve is the subtraction step within the parentheses (120 – 6 = 114). Second, the student should have performed the multiplication step [4(114) = 456]. Then the student should have performed the addition within the brackets [36 + 456 = 492]. Finally, the student should have divided by 2, resulting in 246: (492 ÷ 2 = 246). This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely performed the operations without the correct groupings, using only order of operations. The student needs to focus on understanding how to perform the order of operations and on how to simplify numerical expressions that do not involve exponents, including up to two levels of grouping.
	Option B is incorrect	The student likely performed the operations without the correct groupings, using only order of operations. The student needs to focus on understanding how to perform the order of operations and on how to simplify numerical expressions that do not involve exponents, including up to two levels of grouping.
	Option C is incorrect	The student likely performed the operations without the correct groupings, using only order of operations. The student needs to focus on understanding how to perform the order of operations and on how to simplify numerical expressions that do not involve exponents, including up to two levels of grouping.

Item #	Rationale	
29	Option B is correct	To determine how much of the pizza Ethel and Gustavo ate, the student could have first converted $\frac{1}{4}$ to have a denominator of 8 by multiplying the numerator (top number in a fraction) and the denominator (bottom number in a fraction) by 2: $\left(\frac{2}{2} \times \frac{1}{4} = \frac{2}{8}\right)$. Then the student could have added $\frac{2}{8} + \frac{3}{8}$ to get a total of $\frac{5}{8}$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	The student likely added the numerators and added the denominators $\left(\frac{1+3}{4+8} = \frac{4}{12}\right)$. The student needs to focus on understanding how to add fractions with different denominators.
	Option C is incorrect	The student likely correctly found the common denominator $\left(\frac{1}{4} = \frac{2}{8}\right)$, but then added the numerators and added the denominators $\left(\frac{2+3}{8+8} = \frac{5}{16}\right)$. The student needs to focus on how to add fractions correctly.
	Option D is incorrect	The student likely added 4 to the numerator and to the denominator of $\frac{1}{4}$ to arrive at a common denominator ($\frac{1+4}{4+4} = \frac{5}{8}$). The student then added $\frac{5}{8} + \frac{3}{8} = \frac{8}{8}$. The student needs to focus on understanding how to find common denominators.

Item #	Rationale	
30	Option C is correct	To determine what fraction of the fifth-grade students earned a score higher than 80 on both the reading test and the science test, the student should have analyzed the scatterplot, looking for values greater than 80 on both the *x*- and *y*-axes. The student should have determined that there are 7 points that are greater than 80 on both the reading test and the science test. The scatterplot contains a total of 18 points. Therefore, the fraction of 5th-grade students who earned a score higher than 80 on both the reading test and the science test is equal to $\frac{7}{18}$.
	Option A is incorrect	The student likely counted the number of test scores above 85 for science and reading, which is a total of 4 out of 18 points on the scatterplot, or $\frac{4}{18}$. The student needs to focus on solving one- and two-step problems using data from a scatterplot.
	Option B is incorrect	The student likely counted the number of test scores above 80 for science only and did not include any reading test scores. The scatterplot shows 11 science test scores above 80, or $\frac{11}{18}$ of the total. The student needs to focus on solving one- and two-step problems using data from a scatterplot.
	Option D is incorrect	The student likely counted the number of test scores at or above 80 for reading only and did not include any science test scores. The scatterplot shows 10 reading test scores above 80, or $\frac{10}{18}$ of the total. The student needs to focus on solving one- and two-step problems using data from a scatterplot.

Item #	Rationale	
31	4, 5, 3, 1, 5 (4.5 ÷ 3 = 1.5)	To determine how to complete the decimal equation to represent the model, the student should have used the key (4 squares = 1 waffle) to determine that there are a total of 4.5 waffles. Then the student should have determined that the waffles were split into 3 equal groups with 1.5 waffles in each group. The model represents the equation 4.5 ÷ 3 = 1.5.

Item #	Rationale	
32	Option A is correct	To determine the model that could represent the base of the rectangular prism, the student should have used the formula from the Volume section of the STAAR Grade 5 Mathematics Reference Materials page within the student's test booklet, $V = l \times w \times h$, where V = volume, l = length, w = width, and h = height. The student should have calculated $96 \div 6 = 16$, indicating that the total area of the base should be 16 square units, represented by $l \times w$. The student should have then identified that the only model of the base that could equal 16 square units is Model A, where the base is 4×4, totaling 16 square units.
	Option B is incorrect	The student likely miscounted the dimensions of the base as 2 units by 8 units. The student needs to focus on representing and solving problems related to volume.
	Option C is incorrect	The student likely assumed that the height of 6 corresponded to the 6 in the ones place value of the volume, 96 cubic inches, and therefore chose a base model of 9 to represent the 9 in the tens place value. The student needs to focus on representing and solving problems related to volume.
	Option D is incorrect	The student likely had a division error when calculating $96 \div 6$, resulting in 15 instead of 16. The student then chose a base of 3×5 to represent the calculation of 15. The student needs to focus on completing the operation of division correctly to solve problems related to volume.

Item #	Rationale	
33	Option D is correct	To determine which tax Susanne paid as part of the total cost for the rug, the student should have determined that the tax paid on the value of a piece of home decor is sales tax.
	Option A is incorrect	The student likely confused income tax with sales tax. The student needs to focus on understanding the differences between income tax, payroll tax, property tax, and sales tax.
	Option B is incorrect	The student likely confused payroll tax with sales tax. The student needs to focus on understanding the differences between income tax, payroll tax, property tax, and sales tax.
	Option C is incorrect	The student likely confused property tax with sales tax. The student needs to focus on understanding the differences between income tax, payroll tax, property tax, and sales tax.

Item #	Rationale	
34	Option C is correct	To determine the quotient (answer), the student should have divided 9.45 by 15, resulting in 0.63.
	Option A is incorrect	The student likely divided 9.45 by 15 but misplaced the decimal point in the quotient. The student needs to focus on understanding how to carry out all the steps in the division algorithm (procedure) with accuracy and to focus on solving for quotients of decimals to the hundredths.
	Option B is incorrect	The student likely divided 0.45 by 15, resulting in a quotient of 0.03. The student needs to focus on understanding how to carry out all the steps in the division algorithm with accuracy and to focus on solving for quotients of decimals to the hundredths.
	Option D is incorrect	The student likely divided 9 by 15, resulting in a quotient of 0.6. The student needs to focus on understanding how to carry out all the steps in the division algorithm with accuracy and to focus on solving for quotients of decimals to the hundredths.