Item Position	Rationale	
1	Option A is correct	To determine which equation (a mathematic statement that demonstrates that two number expressions, or other objects, are equal) is true when = 5, the student could have substituted 5 for in each answer option, starting with the equation 2 = 10 in option A. The student should have recognized that a number immediately next to a variable (letter that represents an unknown value) is multiplied by the variable. Therefore, 2 = 10 becomes 2(5) = 10, and 10 = 10, so this equation is true when = 5. Option A is the only answer option with an equation that is true when = 5. 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 replaced the variable with the digit 5, rather than multiplying, so that 3 = 35 beg 0e.tbbeowg3ET5Tstqu2de4nt4s.h2c 30.4u9.9-9-5 (t2)9 1 (5d.)3]TJ0.0173 2

Spring STAAR 2024 Grade 6 Mathematics Rationales

Item Oebges

Item Position	Rationale	
4	8, asymmetrical	To determine the correct answers needed to complete the statements, the student could have recognized that the mean of a set of data is found by adding the numbers in the set and dividing the sum (total) by how many numbers are in the set. The student then could have listed and added the values from the dot plot (2 + 4 + 6 + 6 + 7 + 8 + 8 + 9 + 9 + 9 + 10 + 10 + 10 + 11 + 11 = 120) and then divided by 15 (because there are 15 numbers in the set): 120 ÷ 15 = 8. Then the student could have observed the display of the data on the dot plot (a representation of data with an axis usually on either the bottom or left side and “dots” stacked above the value to represent the numbers of items) and found that the data presents an asymmetrical shape, meaning that the data set does not reflect over the midpoint. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationale	
5	Option C is correct	To determine the solution to the equation (a mathematical

Item Position	Rationale

Item Position	Rationale	
7	Option B is correct	To determine the height, , of the prism (a three-dimensional figure containing two congruent and parallel faces that are polygons) in units, the student could have substituted the given values into the formula for the volume of (amount of three-dimensional space taken up by) a rectangular prism. This formula can be found in the Volume section of the STAAR Grade 6 Mathematics Reference Materials: = , where represents the volume, represents the area (measurement of the interior region of a 2-dimensional space, measured by the number of non-overlapping square units) of the base, and represents the height (vertical distance from top to bottom). To determine , the area of the base, the student could have multiplied 4 units by 4 units (because all four sides of a square are equal in length), resulting in 16 square units. Then the student could have substituted the values = 192 and = 16 into the formula

		lengths from least to greatest rather than from greatest to least. The student likely identified the side length as the shortest because its adjacent angle, angle , measures 35°. The student then identified side length as the second longest because its adjacent angle, angle , measures 65° and identified side length as the longest because its adjacent angle, angle , measures 80°. The student needs to focus on attending to the details of the question and on extending previous knowledge of triangles and their properties, including the relationship between a triangle's angles and its sides.

Item Position	Rationale	
10	Option A is correct	To determine which situation about the school bus most likely yields data without variability, the student should have recognized that variability of data means the ability of the data to vary, or change, because of a likely lack of consistency. A situation whose data has

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Item Position	Rationale	
14	Option A is correct	To determine which proportion (comparison of two ratios) could be used to find , the length of the model in inches, the student could have first recognized that the scale (a comparison of two values) the model of the classroom uses is a ratio of 2 inches to 3 feet, meaning that every 2 inches in the model represents 3 feet in the actual classroom. The length of the actual classroom is 30 feet. Using that measurement and , the student could have set up and equivalent ratio that could be used in a proportion. Since a ratio can be written as a fraction, 2:3 becomes $\frac{6}{7}$. To create a ratio equivalent to $\frac{6}{7}$, the student should have matched the length of the classroom and the variable to their corresponding measurements. The length of the model is inches, which corresponds to the 2 inches in the ratio for the scale. The actual length of the classroom, 30 feet, corresponds to the 3 feet in the ratio for the scale. So the proportion is written as $\frac{6}{7} = \frac{ë}{74}$ or $\frac{ë}{74} = \frac{6}{7}$. 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 created incorrect ratios by confusing the scale measurements and the actual measurements, placing the given scale in inches (2) over the length of the actual classroom in feet (30) and putting the variable (the length of the model) over the given scale in feet (3). The student should focus on setting up proportions so that the ratios correspond.
	Option C is incorrect	The student likely created incorrect ratios by confusing the scale measurements and the actual measurements, placing the given scale in feet (3) over the variable (the length of the model classroom) and the given scale in inches (2) over the length of the actual classroom in feet (30). The student should

		focus on setting up proportions so that the ratios correspond.
	Option D is incorrect	The student likely created incorrect ratios by using the given scale in inches (2) as the numerator for both fractions, disregarding the given scale in feet (3). The student should focus on setting up proportions so that the ratios correspond.

Item Position	

Item Position	Rationale	
16	Option D is correct	To determine which equation represents , the length of Mr. Guzman's camping trailer in feet, the student should have recognized that 6 feet would need to be subtracted from , the length of Ms. Palmer's camping trailer: = – 6.
	Option A is incorrect	The student likely misunderstood the mathematical language indicating subtraction as meaning multiplication and multiplied –6 by , the length of Ms. Palmer's trailer. The student needs to focus on understanding how to write one-step equations to represent conditions in real-world problems.
	Option B is incorrect	The student likely misunderstood how to indicate which number is being subtracted, and subtracted the length of Ms. Palmer's trailer from 6 instead of subtracting 6 from the length of Ms. Palmer's trailer. The student needs to focus on understanding how to write one-step equations to represent conditions in real-world problems.
	Option C is incorrect	The student likely misunderstood the mathematical language indicating subtraction as meaning addition and added 6 to , the length ofq240.72 3971Tw 4.33 0 T. Palmef subto's tr53d of s o Ms. Palmede f -

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		in the list (5) from the last number (9). The student should focus on understanding the process steps used when summarizing numerical data with numerical summaries such as the range.

Item Position	Rationale	
20	The solution set is graphed with an open circle at 6 and an arrow pointing to the right.	To determine the solution to the inequality $3L > 18$, the student could have first divided both sides of the given inequality by 3, which results in $L > 6$. Next, the student could have interpreted the “>” symbol as “greater than” and realized that only numbers larger than but not equal to 6 represent a solution to the inequality. The open circle indicates that the number 6 is not included as a solution. Last, the student should have realized that ward the right side of the number line. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationale	
21	Option A is correct	To determine which measurement is equivalent to 0.05 inch, the student should have converted 0.05 to a fraction. Since the digit 5 is in the hundredths place, the fraction would be written as $\frac{9}{544}$.That is not an answer choice, so the student should have found a fraction equivalent to $\frac{9}{544}$.To find an equivalent fraction, the student should have multiplied or divided the numerator and denominator by the same number. Since 5 can be divided by 5 and 100 can be divided by 5, the equivalent fraction would be
	Option B is incorrect	The student likely converted 0.05 to a fraction incorrectly by reading the decimal as 50 hundredths and reducing $\frac{94}{544}\frac{5}{6}$.to _ The student should focus on converting decimals to fractions.
	Option C is incorrect	The student likely converted 0.05 to a fraction incorrectly by using the 5 as the denominator and 1 as the numerator. The student should focus on converting decimals to fractions.
	Option D is incorrect	The student likely converted 0.05 to a fraction incorrectly by using 50 as the denominator and 1 as the numerator. The student should focus on converting decimals to fractions.

Item Position	Rationale	
23	Option A is correct	To determine which statement correctly compares the fees that Bank Q and Bank R will charge the customer, the student could have multipli-2 (r)-6 (-1 (e)]TJ0 T(o)-7 (s)-2 (t)1 (um -1.22n(t)-9

Item Position	Rationale	
24	Option B is correct	To determine which Venn diagram shows the correct relationship among the numbers in the list, the student should have first considered the classification system for the sets of numbers. The largest classification in the Venn diagram is Rational numbers. Rational numbers are all numbers that can be represented as the ratio of two integers. There are many special types of rational numbers, such as fractions, decimals, integers, and whole numbers. Two of the special types of rational numbers (integers and whole numbers) are shown in the Venn diagram. Integers make up the second largest classification in the Venn diagram. Integers are all the positive and negative numbers with no decimal or fraction parts, and zero. Whole numbers make up the smallest classification in the Venn diagram. Whole numbers are all the positive integers and zero. The student should have determined that $F\frac{7}{<}$ is a rational number because it can be written as the ratio of two integers, but it is not an integer or a whole number, because it has a decimal part (–0.375). Therefore, $F\frac{7}{<}$ should be placed in the rational numbers section of the Venn diagram. The student should have determined that 25 is a rational number because it can be written as the ratio of two integers $@\frac{69}{5}A$, an integer because it does not have a decimal part (25.0), and a whole number because it is positive. Therefore, 25 can be placed within the whole numbers section of the Venn diagram. The student should have determined that –10 is a rational number because it can be written as the ratio of two integers $@F\frac{54}{5}A$, and an integer because it does not have a decimal part (–10.0). However, –10 is not a whole number, because it is negative; therefore, –10 should be placed within the integer section of the Venn diagram. Finally, the student should have

		determined that 0.163 is a rational number because it can be written as the ratio of two integers $@\frac{5:7}{5,444}A$, but it is not an integer or a whole number because it has a decimal part (0.163); therefore, it should be placed within the rational numbers section of the Venn diagram.
	Option A is incorrect	The student likely confused the definitions of integers and whole numbers, as well as the relationship between the two (all whole numbers are integers, so the whole number section should be drawn within the integer section). The student needs to focus on understanding the difference between integers and whole numbers.
	Option C is incorrect	The student likely confused the relationship between integers and whole numbers. The student needs to focus on understanding the relationship between integers and whole numbers.
	Option D is incorrect	The student likely misunderstood the definition of integers, identifying all negative numbers, even those with decimal parts, as integers. The student needs to focus on understanding the characteristics of integers.

Item Position	Rationale	
25	Option C is correct	To determine which statement is true based on the stem and leaf plot, the student could have identified that there are a total of 25 people volunteering at the food drive and that the maximum age (69) minus the minimum age (20) gives a range of 49 years. Finally, the student could have identified the duplicate ages (22, 22, 31, 31, 38, 38, 65, 65, 65) and determined that 65 is the mode (the number that appears most often) of the data because it has a higher frequency than any other age. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option A is incorrect	

Item Position	Rationale	
27	Option A is correct	To determine which groups could represent the numbers of student volunteers and adult volunteers at the event, the student could have recognized that an DC 10.36 64.92 29.16n7 (e)- -2 (a

	Option B is **incorrect**	The student likely confused the numbers given in the initial ratio, multiplying 2 students (instead of 5) and 5 adults (instead of 2) by 10. The student needs to focus on attending to the details of the question and on understanding how to determine equivalent ratios.
	Option	

Item Position	Rationale	
28	Option C is correct	To determine which equation represents the relationship between , the number of pears, and , the number of figs, the student should have identified as the independent variable (symbol used to represent an unknown number). The student should have also recognized that each value of is 2 times the corresponding value of . . The student then should have determined that the equation = 2 represents the relationship between each pair of values in the table: 2 = 1 × 2, 6 = 3 × 2, and 8 = 4 × 2.
	Option A is incorrect	The student likely noticed that, in the first row of the table, the value of , the number of figs is 1 more than the value of , the number of pears, and interpreted that relationship as representing the whole table. The student needs to focus on writing an equation that represents the relationship between all independent and dependent quantities from a table.
	Option B is incorrect	The student likely reversed the and the in the relationship and interpreted the value of , the number of pears, inn

Item Position	Rationale	
31	Option D is correct	To determine which pair of expressions are equivalent, the student could have identified the like terms (terms that contain the same variables or that are constant terms) and combined them by adding. The student could have also recognized that 8 + (–8) = 0; therefore, 3 + 8 + (–8) = 3 + 0 = 3 . This is an efficient way to solve 1 Tf0.6 0 Tdd/TT0 1 Tf0.6 0 T

Item Position	Rationale
32	16.5

Item Position	Rationale	
34	0.375, 37.5%	To determine which values are equivalent to $\frac{7}{<}$, the student could have converted $\frac{7}{<}$ to both a decimal number and a percentage. To find the decimal number equivalent to $\frac{7}{<}$, the student should have divided the numerator (top number in a fraction), 3, by the denominator (bottom number in a fraction), 8, to get 0.375. The find the percentage equivalent to $\frac{7}{<}$, the student should have used the decimal form, 0.375, and moved the decimal point two places to the right to represent multiplying by 100, resulting in 37.5%. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationale	
35	Option C is correct	To determine how many students are in the class if each student got 1.5 ounces of vinegar, the student could have divided 31.5 by 1.5. First, the student could have moved the decimal point one place to the right in both the divisor (1.5 --> 15) and the dividend (31.5 --> 315) and used the standard long division algorithm (procedure) to divide 315 ÷ 15 = 21. 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 rounded 31.5 to 32 and 1.5 to 2 and then divided 32 ÷ 2 = 16. The student needs to focus on understanding how to divide positive rational numbers fluently.
	Option B is incorrect	The student likely subtracted 1.5 from 31.5. The student needs to focus on understanding how to divide positive rational numbers fluently.
	Option D is incorrect	The student likely added 1.5 to 31.5. The student needs to focus on understanding how to divide positive rational numbers fluently.