STAAR Spring 2025 Grade 7 Mathematics Rationales

Item Position	Rationales	
1	Option C is correct	To determine which statement is true about the next 350 children surveyed about their favorite ice cream flavor, the student could have found the number of children out of 350 who will probably select each flavor. Since the original survey is of 70 children, and 16 of those children selected vanilla, the proportion (comparison of two ratios) to predict the number of children out of 350 who will select vanilla, v, is $\frac{16}{70} = \frac{v}{350}$. To find the value of v, the student could have multiplied 16 by 350, resulting in 5,600, and then divided 5,600 by 70, resulting in v = 80 children who will select vanilla. Similarly, proportions to predict the numbers of children who will select chocolate, x; the number of children who will select strawberry, y; and the number of children who will select orange sherbet, z, are $\frac{28}{70} = \frac{x}{350}$, $\frac{12}{70} = \frac{y}{350}$, and $\frac{14}{70} = \frac{z}{350}$. Solving these proportions results in predicted numbers of 140 children who will select chocolate, 60 children who will select strawberry, and 70 children who will select orange sherbet. The student then could have determined that the number of children who select chocolate will be twice the number of children who select orange sherbert because 140 is twice as many as 70. 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 the values in the table to the nearest ten and considered the number of children who selected vanilla to be 20 (16 rounded to the nearest ten) and the number of children who selected strawberry to be 10 (12 rounded to the nearest ten). The student then likely compared 20 children to 10 children, rather than making a prediction about future surveyed children, and determined that the number of children who select vanilla will be twice the number of children who select strawberry. The student needs to focus on solving problems involving proportional relationships using quantitative predictions from simple experiments.
	Option B is incorrect	The student likely found the difference between the number of children who selected vanilla and the number of children who selected orange sherbet given in the table, 16 – 14 = 2, rather than making a prediction about future surveyed children. The student then likely misinterpreted the difference as a multiplicative relationship and determined that the number of children who select vanilla will be twice the number of children who select orange sherbet. The student needs to focus on solving problems involving proportional relationships using quantitative predictions from simple experiments.
	Option D is incorrect	The student likely found the difference between the values given in the table for the number of children who selected orange sherbet and the number of children who selected strawberry, 14 – 12 = 2, rather than making a prediction about future surveyed children. The student then likely misinterpreted the difference as a multiplicative relationship and determined that the number of children who select orange sherbet will be twice the number of children who select strawberry. The student needs to focus on solving problems involving proportional relationships using quantitative predictions from simple experiments.

Item Position	Rationales	
2	divide, 15, 12, 1.25	To determine the statement that describes how to calculate the price per pair of socks, the student could have recognized that the total cost must be divided by the number of pairs of socks. The student could then have identified the total cost as $15 and the number of pairs of socks sold as 12. To determine the price per pair of socks, the student could have divided 15 by 12 and obtained 1.25. Therefore, the price is $1.25 per pair of socks. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

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Item Position	Rationales	
3	Option D is correct	To determine which statement shows how to correct the error in the Venn diagram, the student should have identified that $-\frac{12}{2}$ simplifies to –6, which is most specifically categorized as an integer. The student could have then identified that $-\frac{12}{2}$ should be moved to Set L to correct the Venn diagram.
	Option A is incorrect	The student likely considered only positive numbers to be integers and concluded that the number –8 should be removed from Set L. The student needs to focus on describing relationships between sets of rational numbers.
	Option B is incorrect	The student likely considered only even numbers to be integers and concluded that the number 3 should be removed from Set L. The student needs to focus on describing relationships between sets of rational numbers.
	Option C is incorrect	The student likely considered $-\frac{3}{5}$ to be an integer because the numerator, –3, and the denominator, 5, are both integers, and concluded that $-\frac{3}{5}$ should be moved to Set L. The student needs to focus on describing relationships between sets of rational numbers.

Item Position	Rationales	
4	Option C is correct	To determine which representation best describes the number of cycles of traffic light changes, *y*, that occur in *x* hours, the student could have first determined the constant rate of change (ratio of the change in *y*-values to the change in *x*-values) for the situation by dividing 90 cycles by 2 hours, resulting in 45 cycles per hour. The student then could have checked the *x*- and *y*-values to find the representation in which each *y*-value is the result of multiplying the corresponding *x*-value by 45, which is the table that contains the ordered pairs (1, 45), (3, 135), and (5, 225). 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 transposed the variables *x* and *y* when writing an equation to represent the situation. The student needs to focus on understanding the independent and dependent quantities in a scenario.
	Option B is incorrect	The student likely confused a multiplicative relationship with an additive relationship and identified an equation that would increase each *x*-value by 45 rather than multiplying each *x*-value by 45. The student needs to focus on understanding proportional relationships.
	Option D is incorrect	The student likely misidentified the initial value of the scenario as (0, 45) instead of (0, 0). The student needs to focus on understanding proportional relationships.

Item Position	Rationales	
5	Option D is correct	To determine the volume (amount of three-dimensional space) of the chocolate bar in cubic centimeters, the student should have used the formula for the volume of a triangular prism: $V = Bh$, where V is the volume, B is the area (amount of two-dimensional space covered by a surface) of the base, and h is the height (distance between the two bases of a prism) of the prism. To determine the area of the base, the student could have used the formula for the area of a triangle, $A = \frac{1}{2}bh$, where b is the length of the triangle's base, and h is the height of the triangle. The result is $A = \frac{1}{2}(10)(12) = 60$ square centimeters. The student then could have substituted 60 for B and 20 for h in the formula for the volume of a triangular prism. The result is $V = (60)(20) = 1{,}200$ cubic centimeters. 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 side length of the triangular base, 13, as the height and calculated the area of the base as $A = \frac{1}{2}(10)(13) = 65$ cm^2. The student then likely calculated the volume of the triangular prism as $V = (65)(20) = 1{,}300$ cm^3. The student needs to focus on understanding how to apply formulas to solve problems involving the volume of three-dimensional figures.
	Option B is incorrect	The student likely forgot to multiply by $\frac{1}{2}$ when finding the area of the triangular base and used a side length of the triangular base, 13, as the height, which results in $A = (10)(13) = 130$ cm^2. The student then likely calculated the volume as $V = (130)(20) = 2{,}600$ cm^3. The student needs to focus on understanding how to apply formulas to solve problems involving the volume of three-dimensional figures.
	Option C is incorrect	The student likely forgot to multiply by $\frac{1}{2}$ when finding the area of the triangular base and calculated $A = (10)(12) = 120$ cm^2. The student then likely calculated the volume as $V = (120)(20) = 2{,}400$ cm^3. The student needs to focus on understanding how to apply formulas to solve problems involving the volume of three-dimensional figures.

Item Position	Rationales	
6	15 times, 75 times	To determine a reasonable prediction for the number of times the arrow of the spinner will land on 20, the student could have determined the probability (how likely it is that an event will occur) of the arrow landing on 20 as the ratio of the number of sections with 20 to the total number of sections, resulting in $\frac{1}{10}$. Then the student could have multiplied this probability by 150, the number of times the arrow is spun during the game, resulting in $\frac{1}{10}(150) = 15$. Therefore, the student could have determined that the arrow will land on 20 about 15 times during the game. To determine a reasonable prediction for the number of times the arrow will land on either 0 or 5, the student could have determined the probability (how likely it is that an event will occur) of the arrow landing on 0 or 5 as the ratio of the number of sections labeled 0 or 5 to the total number of sections. There are 3 sections labeled 0 and 2 sections labeled 5, so there are 3 + 2 = 5 spaces labeled 0 or 5, resulting in a probability of $\frac{5}{10} = \frac{1}{2}$. Then the student could have multiplied this probability by 150, the number of times the arrow is spun in the game, resulting in $\frac{1}{2}(150) = 75$. Therefore, the student could have determined that the arrow will land on 0 or 5 about 75 times during the game. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
7	Option C is correct	To determine the percent increase in the student's hourly pay, the student could have calculated the amount the hourly pay increases by after one year and then divided that result by the original hourly wage. To calculate the increase in the hourly wage, the student could have subtracted 12 from 15, which results in 3. Next, the student could have divided the $3 increase in the hourly wage by the original hourly wage, $12. This results in $\frac{3}{12} = \frac{1}{4} = 0.25$. Finally, the student could have converted 0.25 to a percentage (a number expressed as a part of 100) by moving the decimal point two places to the right, resulting in 25%. 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 interpreted the difference in dollars between the new hourly wage and the original hourly wage, 3, as the percent increase. The student needs to focus on understanding how to solve problems involving percent increase.
	Option B is incorrect	The student likely interpreted the new hourly wage in dollars as the percent increase. The student needs to focus on understanding how to solve problems involving percent increase.
	Option D is incorrect	The student likely added 3, the difference in dollars between the new hourly wage and the original hourly wage, to the new hourly wage, resulting in 15 + 3 = 18. The student then likely interpreted this result as the percent increase. The student needs to focus on understanding how to solve problems involving percent increase.

Item Position	Rationales	
8	314, 63	To determine the measurement that is closest to the area (amount of space covered by a surface) of the circular sign in square inches, the student should have used the formula for the area of a circle: $A = \pi r^2$, where A is the area of the circle, r is the radius (distance from the center of the circle to a point on the circle), and π is approximately 3.14. The student should have recognized that the radius of the circle is half the given diameter (length of a line segment that goes through the center of a circle and connects two points on the circle) of 20 inches, resulting in $r = 20 \div 2 = 10$ inches. The student then should have substituted $r = 10$ into the formula for the area of a circle, resulting in $A = \pi(10)^2 \approx 314$ square inches. To determine which measurement is closest to the circumference (distance around a circle) of the circular sign in inches, the student should have used the formula for the circumference of a circle: $C = 2\pi r$, where C represents the circumference, r represents the radius, and π is approximately 3.14. Substituting 10 for the radius and 3.14 for π into the formula for circumference results in $C = 2\pi(10) \approx 63$ inches. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
9	Option A is correct	To determine which statement best describes Kenny's bank account, the student could have interpreted the rate of change (ratio of the change in *y*-values to the change in *x*-values) and the initial value (starting value) of the equation in terms of the problem situation. The student should have interpreted the rate of change in the equation, −35, as representing a decrease of $35 per week. The student should then have interpreted the constant value in the equation as representing an initial account value, or a beginning balance of $500. 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 misinterpreted the rate of change, −35, as representing an increase rather than a decrease. The student needs to focus on understanding how to represent verbal descriptions of linear relationships using equations.
	Option C is incorrect	The student likely confused the rate of change with the initial value in the equation. The student needs to focus on understanding how to represent verbal descriptions of linear relationships using equations.
	Option D is incorrect	The student likely confused the rate of change with the initial value in the equation. The student likely also misinterpreted the sign of the rate of change as representing an increase rather than a decrease. The student needs to focus on understanding how to represent verbal descriptions of linear relationships using equations.

Item Position	Rationales	
10	Houston	To determine the city that Leila visited, which is 146 miles away from Austin, the student could have set up and solved a proportion (comparison of two ratios) to determine *x*, the distance in inches between the city and Austin on the map. The student could have used the scale factor and the known distance of 146 miles to create the proportion $\frac{0.5 \text{ inches}}{25 \text{ miles}} = \frac{x \text{ inches}}{146 \text{ miles}}$. To find the value of *x*, the student could have multiplied 0.5 by 146, resulting in 73, and then divided 73 by 25, resulting in $x = 2.92$ inches between Austin and the city Leila visited. The student then could have identified that Houston is the city Leila visited, because it is located 2.92 inches away from Austin on the map. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
11	Option D is correct	To determine the value of the expression, the student should have evaluated it according to the order of operations. The student should have first multiplied $4\frac{2}{5}$ by 6, which results in 26.4. The student then should have subtracted 26.4 from –0.8, which results in –27.2.
	Option A is incorrect	The student likely rewrote the fraction $4\frac{2}{5}$ incorrectly as $\frac{20}{5}$ by multiplying the denominator, 5, by the whole number, 4, to obtain 20 and then putting that value over the denominator, 5. The student then likely multiplied $\frac{20}{5}$ by 6 to obtain 24. Finally, the student likely subtracted 24 from –0.8, which results in –24.8. The student needs to focus on performing the mathematical operations (+, −, ×, ÷) that are required to solve a problem.
	Option B is incorrect	The student likely first subtracted $4\frac{2}{5}$ from -0.8 to obtain –5.2. The student then likely multiplied –5.2 by 6, which results in –31.2. The student needs to focus on performing mathematical operations (+, −, ×, ÷) in the correct order to solve a problem.
	Option C is incorrect	The student likely rewrote the fraction $4\frac{2}{5}$ incorrectly as $\frac{20}{5}$ by multiplying the denominator, 5, by the whole number, 4, to obtain 20 and then putting that value over the denominator, 5. The student then likely subtracted $\frac{20}{5}$ from –0.8, which results in –4.8, and multiplied –4.8 by 6, which results in –28.8. The student needs to focus on performing mathematical operations (+, −, ×, ÷) correctly and in the correct order to solve a problem.

Item Position	Rationales	
12	60 and any equivalent values are correct	To determine the area (amount of space covered by a surface) of the figure in square centimeters, the student could have calculated the sum of the areas of the shapes that make up the figure. The student could have calculated the area of the rectangle by multiplying the length by the width: (7)(6) = 42 square centimeters. The student could have determined the area of one of the right triangles using the formula for the area of a triangle: $A = \frac{1}{2}bh$, where *b* is the length of the triangle's base and *h* is the height of the triangle. The student could have determined that the base of the triangle is the difference between the length of the entire figure, 10, and the length of the rectangle, 7: 10 − 7 = 3 centimeters. The student then could have recognized that the height of the triangle is equal to the width of the rectangle, 6 centimeters. The student could have substituted 3 for *b* and 6 for *h*, resulting in $A = \frac{1}{2}(3)(6) = 9$ square centimeters. The student should have recognized that since the two right triangles are congruent, they have the same area. The student then could have found the total area of the composite figure by finding the sum of the areas of the two triangles and the rectangle, resulting in 9 + 9 + 42 = 60 square centimeters. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
13	Option B is correct	To determine the experimental probability (how likely it is that an event will occur based on the results of an experiment) that the next key chain selected will be yellow or green, the student should have recognized that, during the experiment, the frequency of yellow being selected was 5, and the frequency of green being selected was 8. The student then should have added these two values and divided the sum by 40, the total number of times a key chain was selected, resulting in $\frac{5+8}{40} = \frac{13}{40}$. 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 calculated the probability that the next key chain selected will be green. Since the frequency of green being selected is 8, and the total is 40, the probability that green will be selected is $\frac{8}{40} = \frac{1}{5}$. The student needs to focus on understanding how to determine the probability of a simple event from an experiment.
	Option C is incorrect	The student likely determined that yellow key chains and green key chains are 2 choices out of a total of 5 choices and determined that the theoretical probability of choosing yellow or green for the next key chain is $\frac{2}{5}$. The student needs to focus on understanding how to determine the probability of a simple event from an experiment.
	Option D is incorrect	The student likely subtracted the frequency of yellow from the frequency of green, as given in the table, rather than adding the two frequencies, and divided by the total, resulting in $\frac{8-5}{40} = \frac{3}{40}$. The student needs to focus on understanding how to determine the probability of a simple event from an experiment.

Item Position	Rationales	
14	188.4, 60	To determine an approximation of the value of π, the student should have understood that π is the ratio of the circumference (distance around a circle) to the diameter (length of a line segment that goes through the center of the circle and connects two points on the circle). The student could have recognized that, since the radius (distance from the center to a point on the circle), 30 feet, is half the diameter, the diameter is 60 feet. The student then could have used the fact that the circumference is 188.4 feet to determine that π, which is defined as the ratio of the circumference to the diameter, is approximately 188.4 divided by 60. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
15	Option D is correct	To determine which statement is NOT supported by the data shown in the dot plot (graph that uses dots to display data), the student could have noticed that 1 player out of a total of 15 players scored 8 points. Since $\frac{1}{15}$ is not more than $\frac{1}{10}$, the student could have determined it to be false that more than $\frac{1}{10}$ of the players scored 8 points during the game. 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 considered each dot to represent 1%. The student likely determined that, since there are 3 dots above 6, 3%, rather than $\frac{3}{15}$, or 20%, of the players scored 6 points, and therefore the statement is false. The student needs to focus on understanding and interpreting data presented in a dot plot.
	Option B is incorrect	The student likely considered each dot to represent 10%. The student likely determined that, since there are 6 dots above 3, 60%, rather than $\frac{6}{15}$, or 40%, of the players scored 3 points, and therefore the statement is false. The student needs to focus on understanding and interpreting data presented in a dot plot.
	Option C is incorrect	The student likely considered each dot to represent 10%. The student likely determined that, since there are 2 dots above 4, 20%, rather than $\frac{2}{15}$ or 13.3%, of the players scored 4 points. The student then likely and compared 20% to $\frac{1}{3}$ and mistakenly determined that 20% is greater than $\frac{1}{3}$. The student needs to focus on understanding and interpreting data presented in a dot plot.

Item Position	Rationales	
16	Option D is correct	To determine the solution set that represents x, the number of guests that can attend the party, the student could have first written an inequality to represent the situation. The student should have recognized that, because the fee to rent the movie theater is $150, and the food will cost $12 per guest, the total cost can be represented by the expression $12x + 150$., since Arnold can spend no more than $450, the expression must be less than or equal to 450, resulting in the inequality $12x + 150 \leq 450$. The student then could have solved the inequality using inverse operations by first subtracting 150 from both sides of the inequality, resulting in $12x \leq 300$, and then dividing both sides of the inequality by 12, resulting in $x \leq 25$. 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 misinterpreted the phrase "no more than $450" as meaning "greater than or equal to $450" and set up the inequality $12x + 150 \geq 450$. The student then likely added 150 to the right side of the inequality instead of subtracting 150, resulting in $12x \geq 600$, and then divided both sides of the inequality by 12 to obtain $x \geq 50$. The student needs to focus on understanding how to model and solve a two-step inequality.
	Option B is incorrect	The student likely set up the correct inequality, $12x + 150 \leq 450$, but added 150 to the right side of the inequality instead of subtracting 150, resulting in $12x \leq 600$, and then divided both sides of the inequality by 12 to obtain $x \leq 50$. The student needs to focus on understanding how to solve a two-step inequality.
	Option C is incorrect	The student likely misinterpreted the phrase "no more than $450" as meaning "greater than or equal to $450" and set up and solved the inequality $12x + 150 \geq 450$. The student needs to focus on understanding how to model a situation using a two-step inequality.

Item Position	Rationales	
17	Option B is correct	To determine which statement is best supported by the information in the box plots (a graphical method for showing the five-number summary of a data set: minimum, lower quartile, median, upper quartile, and maximum), the student could have noticed that the data for Group 1 have an interval of 4 between successive values in the five-number summary which means that the distribution of the data is symmetrical. The student then could have noticed that the data for Group 2 have a larger interval between the minimum and first quartile (the value represented by the left side of the rectangle in a box plot), 21 − 15 = 6, than between the third quartile (the value represented by the right side of the rectangle in a box plot) and the maximum, 33 − 30 = 3, which means that the distribution of the data is not symmetrical. The student then could have concluded that the distribution of the data for Group 1 is more symmetrical than the distribution of the data for Group 2. 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 compared the differences between the third quartile and the median (the value represented by the vertical line within the rectangle in a box plot) for Group 1 and Group 2, which are both 4, rather than the ranges (the difference between the maximum and minimum values of a set of numbers) for the two groups. The student needs to focus on comparing statistics between two sets of data.
	Option C is incorrect	The student likely reversed the comparison between the interquartile range (the difference between the third quartile and the first quartile) for Group 1, which is 8, and the interquartile range for Group 2, which is 9, and concluded that the interquartile range for Group 1 is greater than the interquartile range for Group 2. The student needs to focus on comparing statistics between two sets of data.
	Option D is incorrect	The student likely reversed the comparison between the median number of the data for Group 1, which is 20, and the median number of the data for Group 2, which is 26, and concluded that the median number of the data for Group 1 is greater than the median number of the data for Group 2. The student needs to focus on comparing statistics between two sets of data.

Item Position	Rationales	
18	Option A is correct	To determine the value of x, the student could have set up an equation where the sum of the measures of the three angles of the triangle equals 180 degrees: $x + x + 50 = 180$. The student should have solved this equation to find the value of x; $2x + 50 = 180$; $2x = 130$; $x = 65$. 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 the known angle measure from the sum of the two unknown angle measures, rather than adding, and solved $2x - 50 = 180$; $2x = 230$; $x = 115$. The student needs to focus on understanding how to write equations using geometric concepts, including the sum of angles in a triangle.
	Option C is incorrect	The student likely added the angle measure x degrees only once and set the expression equal to 90 rather than 180 and solved $50 + x = 90$; $x = 40$. The student needs to focus on understanding how to write equations using geometric concepts, including the sum of angles in a triangle.
	Option D is incorrect	The student likely added the angle measure x degrees only once and solved $50 + x = 180$; $x = 130$. The student needs to focus on understanding how to write equations using geometric concepts, including the sum of angles in a triangle.

Item Position	Rationales	
19	Option B is correct	To determine which prediction about the next 50 customers surveyed is supported by the information in the table, the student could have found the number of customers out of 50 who will probably choose each vegetable. Since the original survey is of 100 customers, and 24 of those customers chose potatoes, the proportion (comparison of two ratios) to predict the number of customers out of 50 who will choose potatoes, p, is $\frac{24}{100} = \frac{p}{50}$. To find the value of p, the student could have multiplied 24 by 50, resulting in 1,200, and then divided 1,200 by 100, resulting in $p = 12$ customers who will choose potatoes. Similarly, proportions to predict the number of customers who will choose broccoli, x; the number of customers who will choose corn, y; and the number of customers who will choose green beans, z, are $\frac{16}{100} = \frac{x}{50}$, $\frac{36}{100} = \frac{y}{50}$, and $\frac{24}{100} = \frac{z}{50}$. Solving these proportions results in predictions that 8 customers will choose broccoli, 18 customers will choose corn, and 12 customers will choose green beans. The student then could have determined that customers will choose corn $1\frac{1}{2}$ times as often as green beans, because $12 \cdot 1\frac{1}{2} = 18$. 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 determined that broccoli is 1 choice out of a total of 4 choices and determined that the theoretical probability of a customer choosing broccoli is $\frac{1}{4}$. The student needs to focus on solving problems involving proportional relationships using quantitative predictions from simple experiments.
	Option C is incorrect	The student likely confused an additive relationship with a multiplicative relationship and determined that, since the number of customers who chose potatoes is 8 more than the number of customers who chose broccoli, the number of customers who choose potatoes will be 8 times the number of customers who choose broccoli. The student needs to focus on solving problems involving proportional relationships using quantitative predictions from simple experiments.
	Option D is incorrect	The student likely reversed the comparison between the predicted number of customers who will choose corn, 18, and the predicted number of customers who will choose potatoes, 12. The student needs to focus on solving problems involving proportional relationships using quantitative predictions from simple experiments.

Item Position	Rationales	
20	Option D is correct	To determine the value of *x*, which is the length of side *LM*, in centimeters, the student could have recognized that, since quadrilaterals *KLMN* and *PQRT* are similar figures (two figures with corresponding angle measures equal and corresponding side lengths proportional), sides *KL* and *PQ* are corresponding, and sides *LM* and *QR* are corresponding. Therefore, the side lengths *KL* and *PQ* must be in the same proportion as side lengths *LM* and *QR*, or $\frac{KL}{PQ} = \frac{LM}{QR}$. Substituting the known side lengths into the proportion results in $\frac{90}{10} = \frac{x}{7}$, where *x* is the unknown length of side *LM*. To solve the proportion, the student could have multiplied both sides of the equation by each denominator (the bottom number of a fraction, resulting in 7(90) = 10(*x*), or 630 = 10*x*. Then the student could have divided both sides of the equation by 10, resulting in *x* = 63 centimeters. 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 inverted the ratio of the known side lengths and set up the proportion $\frac{PQ}{KL} = \frac{LM}{QR}$. The student then likely substituted the known side lengths into the proportion and solved $\frac{10}{90} = \frac{x}{7}$; 7(10) = 90(*x*); 70 = 90*x*; $x = \frac{7}{9}$. The student needs to focus on understanding how to solve problems involving similar figures.
	Option B is incorrect	The student likely used sides that do not correspond and inverted the ratio of the known side lengths, resulting in the proportion $\frac{PQ}{KL} = \frac{LM}{PT}$. The student then likely substituted the known side lengths into the proportion and solved $\frac{10}{90} = \frac{x}{4}$; 4(10) = 90(*x*); 40 = 90*x*; $x = \frac{4}{9}$. The student needs to focus on understanding how to solve problems involving similar figures.
	Option C is incorrect	The student likely used sides that do not correspond, resulting in the proportion $\frac{KL}{PQ} = \frac{LM}{PT}$. The student then likely substituted the known side lengths into the equation and solved $\frac{90}{10} = \frac{x}{4}$; 4(90) = 10(*x*); 360 = 10*x*; *x* = 36. The student needs to focus on understanding how to solve problems involving similar figures.

Item Position	Rationales	
21	3, 5	To determine the equation that best represents the relationship between x and y in the graph, the student could have identified the rate of change (ratio of the change in y-values to the change in x--values) and the y-value when $x = 0$ for the graphed line and written the equation in the form $y = mx + b$, where m represents the rate of change and b represents the y-value when $x = 0$. To find the rate of change, the student could have used the points (−1, 2) and (0, 5) and found the ratio of the vertical (up-and-down) distance to the horizontal (left-to-right) distance between the points. The vertical distance between these two points is 5 − 2 = 3 units, and the horizontal distance between these two points is 0 − (−1) = 1 unit. Since the y-values increase from left to right, the rate of change is positive. This results in a rate of change of $\frac{3}{1} = 3$. Based on the graph, the y-value when $x = 0$ is 5. Substituting 3 for m and 5 for b in the equation $y = mx + b$ results in the equation $y = 3x + 5$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
22	Option B is correct	To determine the area (amount of space covered by a two-dimensional figure) of the composite figure, the student could have divided the figure into two rectangles, calculated the areas of the two rectangles, and added them. The student could have determined that the vertical side length of the rectangle on the left is 6 + 7 = 13 meters. The student then could have determined that the horizontal side length of the rectangle on the left is 13 – 8 = 5 meters. The student then should have multiplied the vertical side length by the horizontal side length to determine that the area of the rectangle is (13)(5) = 65 square meters. The student then could have determined that the area of the rectangle on the right is (8)(6) = 48 square meters. Finally, the student could have calculated the area of the figure to be 65 + 48 = 113 square meters. 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 found the perimeter of the figure, 13 + 6 + 8 + 7 + 5 + 7 + 6 = 52. The student needs to focus on understanding how to determine the area of a composite figure.
	Option C is incorrect	The student likely found the area of the top rectangle, (13)(6) = 78, and the area of the missing rectangle, (7)(8) = 56, and added the areas, resulting in 78 + 56 = 134 square meters. The student needs to focus on understanding how to determine the area of a composite figure.
	Option D is incorrect	The student likely calculated the area of the top rectangle as (13)(6) = 78 square meters and the area of the rectangle on the left as (13)(5) = 65 square meters and added them, resulting in 78 + 65 = 134 square meters, but forgot to subtract the area of the overlap of the two rectangles. The student needs to focus on understanding how to determine the area of a composite figure.

Item Position	Rationales	
23	Option A is correct	To determine the value of the expression $0.35 - \frac{1}{5}$, the student could have converted $\frac{1}{5}$ to an equivalent decimal: $\frac{1}{5} = \frac{2}{10} = 0.2$. The student then could have subtracted 0.2 from 0.35, which results in 0.15. 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 used the numerator (top number) and the denominator (bottom number) in the fraction $\frac{1}{5}$ to create 0.15 and calculated $0.35 - 0.15 = 0.20$. The student needs to focus on subtracting rational numbers fluently.
	Option C is incorrect	The student likely converted the fraction $\frac{1}{5}$ to the decimal 0.05 and calculated $0.35 - 0.05 = 0.30$. The student needs to focus on subtracting rational numbers fluently.
	Option D is incorrect	The student likely converted the decimal 0.35 to the fraction $\frac{3}{5}$ and then subtracted, resulting in $\frac{3}{5} - \frac{1}{5} = \frac{2}{5}$. The student then likely converted the fraction $\frac{2}{5}$ to the decimal 0.40. The student needs to focus on subtracting rational numbers fluently.

Item Position	Rationales	
24	Option A is correct	To determine the probability of randomly selecting a red card, replacing the card, and then randomly selecting a card labeled 0, the student could have first found the probability of each event. The probability of selecting a red card is $\frac{1}{4}$ because each color has an equal number of cards in the deck, and red is 1 out of the 4 colors. The probability of selecting a card labeled 0 is $\frac{4}{40}$, or $\frac{1}{10}$, because there are 4 cards labeled 0 (1 for each color) out of a total of 40 cards. Next, the student could have recognized that since each event is independent (not affected by the outcome) of the other, the product rule of probability (the probability of any combination of independent events occurring together can be calculated by multiplying the probabilities of each event occurring alone) applies, resulting in a probability of $\left(\frac{1}{4}\right)\left(\frac{1}{10}\right) = \frac{1}{40}$. 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 considered the probability of selecting any card as $\frac{1}{40}$. The student then likely added $\frac{1}{40} + \frac{1}{40} = \frac{2}{40} = \frac{1}{20}$, rather than multiplying, to represent the drawing of any card from the deck twice. The student needs to focus on understanding how to determine the probability of a compound event.
	Option C is incorrect	The student likely found the probability of selecting a card labeled 0 first and a red card that is not labeled 0 second and added the probabilities, rather than multiplying. The probability of selecting a card labeled 0 is $\frac{4}{40}$, and the probability of selecting a red card that is not labeled 0 is $\frac{9}{40}$, and the sum of the two probabilities is $\frac{4}{40} + \frac{9}{40} = \frac{13}{40}$. The student needs to focus on understanding how to determine the probability of a compound event.
	Option D is incorrect	The student likely added the probabilities of the two events, rather than multiplying, resulting in $\frac{1}{4} + \frac{1}{10} = \frac{10}{40} + \frac{4}{40} = \frac{14}{40} = \frac{7}{20}$. The student needs to focus on understanding how to determine the probability of a compound event.

Item Position	Rationales	
25	Open endpoint on 9 and arrow to the right	To create a number line that represents the solution to the inequality $-6k + 6 < -48$, the student could have first subtracted 6 from both sides of the inequality, resulting in $-6k + 6 - 6 < -48 - 6$, or $-6k < -54$. The student then could have divided both sides of the inequality by −6. When dividing by a negative number, the student should have reversed the inequality sign, resulting in the solution to the inequality, which is $k > 9$. To represent this solution on a number line, the student should have plotted an open point at 9, because the solution set does not include the value 9, and an arrow pointing to the right, because the solution set includes all values greater than 9. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
26	Option C is correct	To determine the volume (amount of three-dimensional space) of the rectangular pyramid in cubic centimeters, the student should have used the formula for the volume of a pyramid: $V = \frac{1}{3}Bh$, where *V* is the volume, *B* is the area (amount of two-dimensional space covered by a surface) of the rectangular base, and *h* is the height (vertical distance from top to bottom) of the pyramid. The student should have calculated the area of the base, *B*, as the length of the rectangular base multiplied by the width, or (15)(4) = 60 square centimeters. The student then should have substituted *B* = 60 and *h* = 9 into the volume formula, resulting in $V = \frac{1}{3}(60)(9) = 180$ cubic centimeters. 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 calculated the perimeter of the base, 2(15) + 2(4) = 38, and substituted it for *B* instead of the area of the base, resulting in $V = \frac{1}{3}(38)(9) = 114$ cubic centimeters. The student needs to focus on understanding how to apply formulas to solve problems involving the volume of three-dimensional figures.
	Option B is incorrect	The student likely substituted the perimeter of the base, instead of the area of the base, for *B* and forgot to multiply by $\frac{1}{3}$ in the formula, resulting in (38)(9) = 342 cubic centimeters. The student needs to focus on understanding how to apply formulas to solve problems involving the volume of three-dimensional figures.
	Option D is incorrect	The student likely forgot to multiply by $\frac{1}{3}$ in the formula, resulting in (60)(9) = 540 cubic centimeters. The student needs to focus on understanding how to apply formulas to solve problems involving the volume of three-dimensional figures.

Item Position	Rationales	
27	more than, exactly	To complete the statement about Roberto's budget, the student should have calculated the amounts Roberto spends on rent and insurance each month and compared the amounts to $1,000 and $500, respectively. To calculate the amount Roberto spends on rent each month, the student could have multiplied the percentage of Roberto's monthly budget spent on rent, 24% or 0.24, by the total monthly income, $5,000, resulting in (0.24)(5,000) = 1,200 dollars spent on rent each month. To calculate the amount Roberto spends on insurance each month, the student could have multiplied the percentage of Roberto's monthly budget spent on insurance, 10% or 0.10, by the total monthly income, $5,000, resulting in (0.10)(5,000) = 500 dollars spent on insurance each month. Finally, the student should have concluded that Roberto spends more than $1,000 on rent each month and exactly $500 on insurance each month. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
28	Option A is correct	To determine which equation can be used to find x, the number of employee offices, the student should have first recognized that the offices and break room in the office building cover an area of 7,000 square feet. Next, the student should have recognized that the area of each office, 125 square feet, represents the coefficient (number in front of the variable) in the equation and that the total area of the employee offices will be added to the area of the break room, 750 square feet, to represent the total area, 7,000 square feet. The student then should have set the expression $125x + 750$ equal to, 7,000, resulting in $125x + 750 = 7{,}000$.
	Option B is incorrect	The student likely transposed the coefficient of the variable, 125, and the constant value, 750, in the equation, resulting in $750x + 125 = 7{,}000$. The student needs to focus on understanding how to write equations based on real-world problems.
	Option C is incorrect	The student likely subtracted the area of the break room from the area of the employee offices instead of adding, resulting in $125x - 750 = 7{,}000$. The student needs to focus on understanding how to write equations based on real-world problems.
	Option D is incorrect	The student likely transposed the coefficient of the variable, 125, and the constant value, 750, in the equation and subtracted instead of adding, resulting in $750x - 125 = 7{,}000$. The student needs to focus on understanding how to write equations based on real-world problems.

Item Position	Rationales	
29	Option B is correct	To determine the diameter (length of a line segment that goes through the center of a circle and connects two points on the circle), d, of the cylinder in feet, the student should have used the formula for the circumference (distance around the circle) of a circle: $C = \pi d$, where C is the circumference and d is the diameter. The student should have substituted the given circumference, 92.4 feet, for C, resulting in $92.4 = \pi d$, and then divided both sides of the equation by π, which is approximately 3.14. This results in $d = \frac{92.4}{3.14} \approx 30$ feet.
	Option A is incorrect	The student likely confused the area (amount of space covered by a surface) with the circumference and substituted 92.4 for A in the formula for the area of a circle, $A = \pi r^2$, where A is the area and r is the radius (distance from the center of the circle to a point on the circle), resulting in $92.4 = \pi r^2$. The student then likely solved for the radius by dividing both sides of the equation by π, which is approximately 3.14, resulting in $30 \approx r^2$, and then taking the square root of both sides, resulting in $5.5 \approx r$. The student then likely multiplied the value of r by 2 to obtain the diameter: (5.5)(2) = 11 feet. The student needs to focus on understanding which formula to apply in calculations involving circles.
	Option C is incorrect	The student likely determined the radius instead of the diameter. The student likely divided the diameter, 30 feet, by 2, resulting in 15 feet. The student needs to focus on correctly applying formulas involving circles.
	Option D is incorrect	The student likely solved the formula correctly but confused radius with diameter and determined that 30 feet represented the radius. The student then likely calculated the diameter as (2)(30) = 60 feet. The student needs to focus on correctly applying formulas involving circles.

Item Position	Rationales	
30	Option C is correct	To determine what part of the campers were young adults, teens, or children, the student could have first recognized that the total number of campers represented in the bar graph is the sum of the heights of all the bars: 50 + 60 + 5 + 25 + 60 = 200 campers. The student then could have determined the number of campers who were young adults, teens, or children, by calculating the sum of their respective bars: 5 + 25 + 60 = 90. The student then could have divided the number of campers who were young adults, teens, or children by the total number of campers, resulting in $\frac{90}{200}$, and converted the fraction to a percentage, resulting in $\frac{45}{100} = 0.45 = 45\%$. 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 calculated the part of the campers that were not young adults, teens, or children, resulting in $\frac{110}{200} = \frac{11}{20}$. The student needs to focus on understanding the part-to-whole relationship when calculating a fraction.
	Option B is incorrect	The student likely divided 3, the number of age groups represented by young adults, teens, and children, by 5, the total number of age groups, resulting in $\frac{3}{5}$. The student needs to focus on understanding the part-to-whole relationship when calculating a fraction.
	Option D is incorrect	The student likely determined the number of campers who were young adults, teens, or children by calculating the sum of their respective bars, 5 + 25 + 60 = 90, and expressed the frequency as a percentage. The student needs to focus on understanding the part-to-whole relationship when calculating a percentage.

Item Position	Rationales	
31	Option A is correct	To determine which equation best represents k, the number of kilograms of food a gray whale eats in d days, the student could have determined that 130,000 kilograms of food per 130 days is equivalent to 1,000 kilograms per day. The student could have then recognized that the total amount of food, k, is equal to 1,000 times the number of days, d. Therefore, the equation that represents the situation is $k = 1{,}000d$. 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 made a place value error when calculating the rate of change and calculated 130,000 ÷ 130 as 10,000 instead of 1,000. The student needs to focus on dividing whole numbers.
	Option C is incorrect	The student likely used the given amount of food consumed in 130 days as the rate of change. The student needs to focus on understanding how to represent real-world situations with algebraic equations.
	Option D is incorrect	The student likely used the given number of days it took to consume 130,000 kilograms of food as the rate of change. The student needs to focus on understanding how to represent real-world situations with algebraic equations.

Item Position	Rationales	
32	Option B is correct	To determine the true statement about the triangles, the student should have recognized that the triangles are similar figures (two figures with corresponding angle measures that are equal and corresponding side lengths that are proportional). Therefore, the corresponding side lengths of the triangles must be proportional (equal in ratio). The student should have determined that, since *ML* and *VL* are corresponding sides, and *MK* and *VT* are corresponding sides, $\frac{ML}{MK} = \frac{VL}{VT}$.
	Option A is incorrect	The student likely used the reciprocal of the ratio on the right side of the proportion, resulting in $\frac{KL}{LM} = \frac{LV}{TL}$ instead of $\frac{KL}{LM} = \frac{TL}{LV}$. The student needs to focus on understanding that the corresponding side lengths of similar figures are proportional and the corresponding angle measures are equal.
	Option C is incorrect	The student likely identified two angles that are not corresponding as congruent because the angles are both located at the top of their respective triangles. The student needs to focus on identifying corresponding angles of similar figures.
	Option D is incorrect	The student likely identified two angles that are not corresponding as congruent because the angles are both located at the bottom of their respective triangles. The student needs to focus on identifying corresponding angles of similar figures.

Item Position	Rationales	
33	Option A is correct	To determine the solution to $3x + 2x + 20 = 50$, the student could have combined the like terms, resulting in $5x + 20 = 50$. Then the student could have used inverse operations to isolate the variable, by first subtracting 20 from both sides of the equation, resulting in $5x = 30$, and then dividing by 5, resulting in $x = 6$. 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 20 to 50 rather than subtracting, resulting in $5x = 70$; $x = 14$. The student needs to focus on understanding how to solve a two-step linear equation.
	Option C is incorrect	The student likely multiplied $3x$ by $2x$ rather than adding, resulting in $6x + 20 = 50$; $6x = 30$; $x = 5$. The student needs to focus on understanding how to solve a two-step linear equation.
	Option D is incorrect	The student likely subtracted 5 from 30, rather than dividing, in the last step, resulting in $5x = 30$; $x = 25$. The student needs to focus on understanding how to solve a two-step linear equation.

Item Position	Rationales	
34	Team P, mode	To determine which team's data set has a greater median (middle number in a set of data when the set is ordered by value), the student should have determined that the median for Team P is 3 goals per game, and the median for Team R is 2 goals per game; therefore, the median is greater for Team P. To determine whether the two sets of numbers have the same mode (most frequent value in a data set), range (difference between the greatest and least values in a data set), or maximum (greatest value in a data set), the student should have calculated the stated measures of center and spread for the data in each dot plot. The mode for both dot plots is 3. Therefore, the mode is the same for the two sets of numbers. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
35	Option A is correct	To determine the total surface area (the amount of space covering the outside of a three-dimensional shape) of the rectangular pyramid in square inches, the student could have calculated the area of the net (two-dimensional view of a three-dimensional figure). The student could have used the formula for the area of a triangle, $A = \frac{1}{2}bh$, where *A* represents the area of the triangle, *b* represents the length of the base of the triangle, and *h* represents the height, and substituted *b* = 7 and *h* = 12 to determine the area of each of the triangles on the left and right sides of the net, resulting in $A = \frac{1}{2}(7)(12) = 42$ square inches. The bottom and top triangles each have a base of 15 inches and a height of 10 inches, resulting in an area of $A = \frac{1}{2}(15)(10) = 75$ square inches. The student could have calculated the area of the rectangular base by substituting *b* = 15 and *h* = 7 into the formula for the area of a rectangle, *A* = *bh*, where *A* represents the area, *b* represents the length of the base, and *h* represents the height, resulting in *A* = (15)(7) = 105 square inches. The sum of the areas of the two pairs of triangles and the rectangle is 2(42) + 2(75) + 105 = 339 square inches. 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 calculated the volume (amount of three-dimensional space) of a prism with a height of 10 inches and a right triangular base with legs of 15 inches and 7 inches. The formula for the volume of a prism is *V* = *Bh*, where *B* is the area of the base and *h* is the height (vertical distance from top to bottom) of the prism. The student likely calculated the area of the right triangular base as $A = \frac{1}{2}(15)(7) = 52.5$ square inches and substituted this area for *B* in the volume formula, resulting in *V* = (52.5)(10) = 525 square inches. The student needs to focus on understanding the steps and formulas needed to determine the surface area of a pyramid from a net.
	Option C is incorrect	The student likely forgot to multiply by $\frac{1}{2}$ when calculating the areas of the triangles, resulting in 2(7)(12) + 2(15)(10) + 105 = 168 + 300 + 105 = 573 square inches. The student needs to focus on understanding the steps and formulas needed to determine the surface area of a pyramid from a net.
	Option D is incorrect	The student likely calculated the volume of a pyramid with a height of 12 inches and a rectangular base with dimensions of 15 inches by 7 inches using the formula for the volume of a pyramid, $V = \frac{1}{3}Bh$, where *V* is the volume, *B* is the area of the base, and *h* is the height of the pyramid, resulting in $V = \frac{1}{3}(15)(7)(12) = 420$ square inches. The student needs to focus on understanding the steps and formulas needed to determine the surface area of a pyramid from a net.

Item Position	Rationales	
36	Option C is correct	To determine how much the scout troop spends on the canvas for the tent, the student should have first multiplied the number of yards of canvas purchased, $11\frac{3}{4}$, by the cost per yard, \$18.36. The student could have converted the fraction $11\frac{3}{4}$ to its equivalent decimal form, 11.75, and then multiplied, resulting in (11.75)(18.36) = 215.73. The student then could have calculated the amount of the discount by multiplying the resulting product by the fraction of the discount, $\frac{1}{10}$, or 0.1: 215.73(0.1) = 21.573. The student then could have subtracted the discount amount from the total cost, resulting in 215.73 – 21.573 = 194.157, which rounds to \$194.16. 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 found the amount of the discount by multiplying the number of yards purchased by $\frac{1}{10}$, or 0.1, and then by the cost per yard, resulting in 11.75(0.1)(18.36) = 21.573, which rounds to \$21.57. The student needs to focus on performing the mathematical operations (+, −, ×, ÷) that are required to solve a problem.
	Option B is incorrect	The student likely added the number of yards of canvas and the cost per yard instead of multiplying, resulting in 11.75 + 18.36 = 30.11. The student then likely calculated the $\frac{1}{10}$ discount and subtracted it, resulting in 30.11 – (0.1)(30.11) = 30.11 – 3.011 = 27.099, which rounds to \$27.10. The student needs to focus on performing the mathematical operations (+, −, ×, ÷) that are required to solve a problem.
	Option D is incorrect	The student likely subtracted \$10, instead of multiplying by $\frac{1}{10}$, to determine the discounted price, resulting in 215.73 – 10 = 205.73. The student needs to focus on performing the mathematical operations (+, −, ×, ÷) that are required to solve a problem.

Item Position	Rationales	
37	$\frac{55}{60}$, 110	To complete the proportion used to find the approximate length of a football field in meters, the student could have understood that the given ratio in the proportion, $\frac{x}{120}$, compares *x*, the length of a football field in meters, to 120, the length of a football field in yards. Therefore, the ratio needed to complete the proportion is the conversion factor, $\frac{55}{60}$, in which 55 meters is approximately equal to 60 yards. To find the approximate length of a football field in meters, the student could have solved the proportion $\frac{x}{120} = \frac{55}{60}$ by first multiplying both sides of the equation by each denominator (the bottom number of a fraction), resulting in $x(60) = 55(120)$, or $60x = 6{,}600$. Finally, the student could have divided both sides of the equation by 60, resulting in $x = 110$. The student could have concluded that the length of a football field is approximately 110 meters. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item Position	Rationales	
38	Option B is correct	To determine how many minutes it would take the cashier to scan 36 items, the student could have first set up the proportion (comparison of two ratios) of the known ratio, 45 items in 8 minutes, to the ratio of 36 items to an unknown number of minutes, x, resulting in $\frac{45 \text{ items}}{8 \text{ minutes}} = \frac{36 \text{ items}}{x \text{ minutes}}$. To solve, the student could have multiplied both sides of the equation by each denominator (the bottom number of a fraction), resulting in $45(x) = 36(8)$, or $45x = 288$. Finally, the student could have divided both sides of the equation by 45, resulting in $x = 6.4$ minutes. 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 found the number of items scanned per minute by dividing 45 by 8, which results in 5.625. The student needs to focus on understanding how to use proportional relationships to solve real-world problems.
	Option C is incorrect	The student likely divided the number of items scanned in 8 minutes, 45, by 36 items, resulting in $45 \div 36 = 1.25$. The student needs to focus on understanding how to use proportional relationships to solve real-world problems.
	Option D is incorrect	The student likely divided 36 items by 8, the number of minutes it took the cashier to scan 45 items, resulting in $36 \div 8 = 4.5$. The student needs to focus on understanding how to use proportional relationships to solve real-world problems.