2022 STAAR Grade 7 Mathematics Rationales

Item #	Rationale	
1	Option C is correct	To determine which measurement is closest to the length of the ruler in millimeters, the student could

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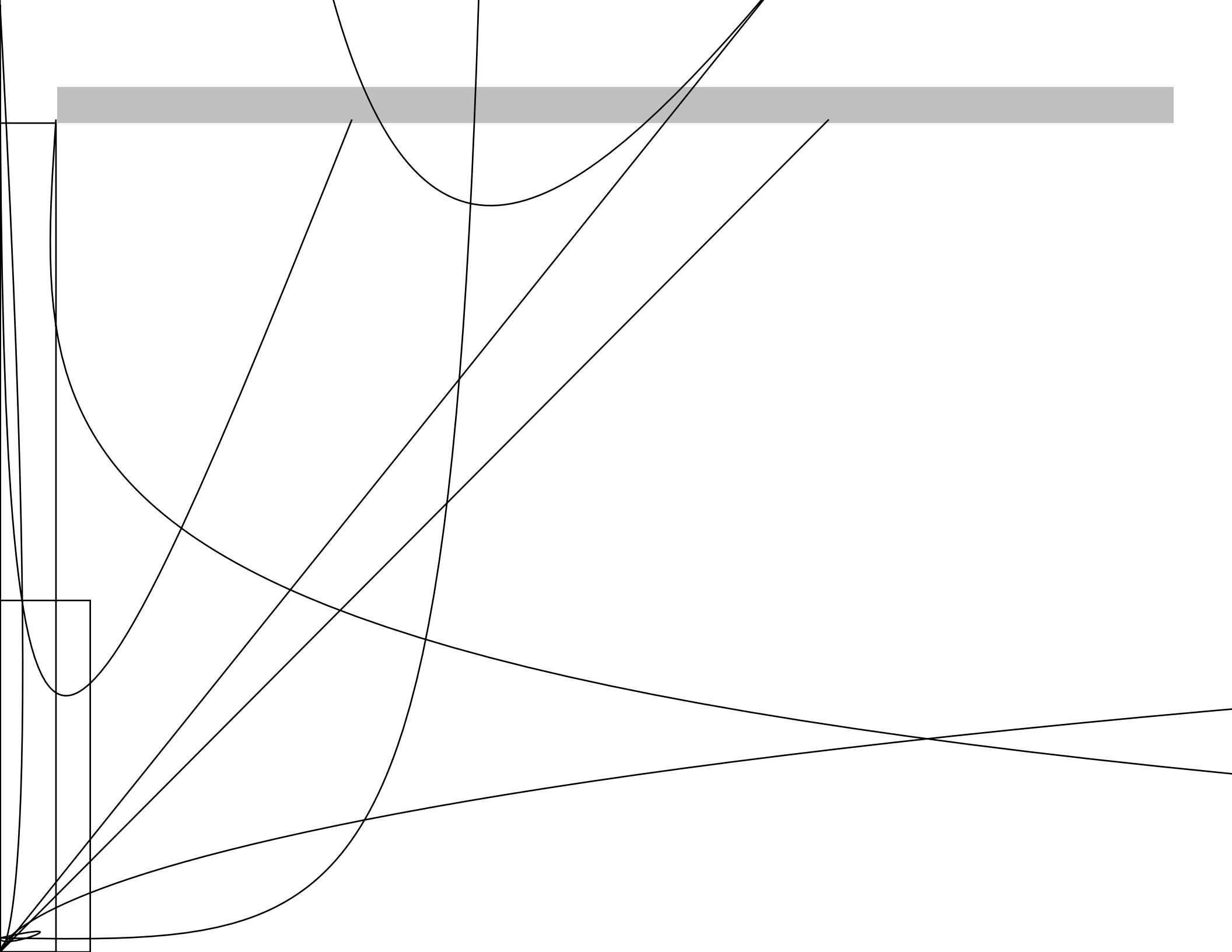| Item #		Rationale
2	Option J is correct	To determine which statement is best supported by the information in the table, the student should have compared the number of bags of cheese-flavored chips (20) with twice the number of bags of ranch-flavored chips (8) and compared the two numbers. Since 20 > 2(8), cheese-flavored chips are more than twice as likely as ranch-flavored chips to be chosen.
	Option F is incorrect	The student likely did not recognize that the number of bags of ranch-flavored chips, 8, is less than the number of bags of plain chips, 12. The student needs to focus on attending to the details of answer options in problems that require the student to interpret and compare information presented in a table.
	Option G is incorrect	The student likely interpreted Òis twice as likely toÓ as Òmore than twice as likely to.Ó The student needs to focus on attending to the details of answer options in problems that require the student to interpret and compare information presented in a table.
	Option H is incorrect	The student likely interpreted that having 4 flavors of potato chips to choose from meant that each flavor is equally likely to be chosen.

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Item #	Rationale	
13	Option C is correct	To determine which measurement is closest to the circumference (distance around the circle) in centimeters, the student should have used the ruler to measure the diameter (line segment going through the center of the circle connecting two points on the circle) to the nearest centimeter. The diameter of the circle is closest to 7 centimeters. The student should have then used the formula for the circumference of a circle ($C = \pi d$, where $C =$ the circumference and $d =$ the diameter) and the approximation of pi, $\pi \approx 3.14$). Substituting 7 for the value of the diameter and 3.14 for π into the formula for circumference results in $C \approx 3.14(7) \approx 21.98$ centimeters, which is approximately 22 centimeters.
	Option A is incorrect	The student likely used the diameter, 7 cm, as the radius (distance from the center of the circle to a point on the circle) in the formula for the area of a circle ($A = \pi r^2$, where $A =$ the area, $r =$ the radius, and $\pi \approx 3.14$), resulting in $A \approx 3.14(7$

Item #	Rationale	
21	Option D is correct	To determine the area (amount of space covered by a surface) of the sidewalk in square feet, the student should have calculated the sum of the areas of the shapes that make up the sidewalk. The sidewalk is made up of two congruent triangles, a rectangle, and a square. The student should have calculated the area of each triangle by substituting $b = 6$ and $h = 6$ into the formula for the area of a triangle $(A = \frac{1}{2}bh$, where A represents the area of the triangle, b represents the base of the triangle, and h represents the height), resulting in $A = \frac{1}{2}(6)(6) = 18$ square feet. The student should have also calculated the area of the rectangle by substituting $b = 18$ and $h = 6$ into the formula for the area of a rectangle ($A = bh$, where A represents the area of the rectangle, b represents the base of the rectangle, and h represents the height), resulting in $A = 18(6) = 108$ square feet. Lastly, since a square is also a rectangle, the student should have calculated the area of the square by using the same formula for area of a rectangle ($A = bh$), substituting the value 6 for b and h into the formula resulting in $A = 6(6) = 36$ square feet. The student should then have found the sum of the areas to find the total area of the sidewalk, resulting in $A = 18 + 18 + 108 + 36 = 180$ square feet.
	Option A is incorrect	The student likely found only the area of the rectangle by multiplying the base and height, resulting in 18(6) = 108 square feet. The student needs to focus on understanding how to determine the area of composite figures.
	Option B is incorrect	The student likely added the area for only one of the triangles instead of the area for both triangles when calculating the total area of the sidewalk, resulting in $A = 18 + 108 + 36 = 162$ square feet. The student needs to focus on understanding how to determine the area of composite figures.
	Option C is incorrect	The student likely added the areas of the triangles and rectangle but ignored the area of the square, resulting in $A = 18 + 18 + 108 = 144$ square feet. The student needs to focus on understanding how to determine the area of composite figures.

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Item #		Rationale
22	62.93 and any equivalent values are correct	To determine the sales tax on the computer, the student should have converted 7% to a decimal by moving the decimal point two places to the left, resulting in 0.07, and multiplied the price of the computer, $899, by 0.07, resulting in $62.93. This is an efficient way to solve the problem; however, other methods could be us ed to solve the problem correctly.

Item #	Rationale	
23	Option D is correct	To determine the graph that best represents the relationship between y and x, the student should have recog nized that the total number of users is represented by y and that the number of days is r epresented by x. The student should have also recognized that the rate at which the number of users increases is 500 users each day. The student then should have check ed pairs of x- and y-values, such as (2, 1,000), (4, 2,000), (6, 3,000), and (8, 4,000), to find the graph in which each y-value was the result of multiplying the corresponding x-value by 500.
	Option A is incorrect	The student likely recognized that the number of users increases by 500 users each day but reversed the meanings of the x- and y-axes. The student needs to focus on how to represent a real -world situation with a graphical representation.
	Option B is incorrect	The student likely recognized th

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Item #		Rationale
30	31.25 and any equivalent values are correct	To determine the length in inches of the building in the scale drawing, the student could have set up the proportion (comparison of two ratios) $\frac{0.25}{2} = \frac{x}{250}$, comparing the ratio of the scale where 0.25 inch represents 2 feet and the ratio of the length of the building in the scale drawing (x inches) to the length of the actual building (250 feet). To solve the proportion, the student could have multiplied by each denominator (the number on the bottom of a fraction) on both sides of the equation, resulting in $2x = 0.25(250)$ or $2x = 62.5$. Lastly, the student could have divided both sides of the equation by 2, resulting in $x = \frac{62.5}{2} = 31.25$. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.

Item #	Rationale	
32	Option F is correct	To determine the amount of simple interest Alice will pay on her loan at the end of one year, the student should have used the formula for simple interest ($I = Prt$, where $I =$ amount of interest, $P =$ the principal amount [initial amount] of the loan, $r =$ the interest rate expressed as a decimal, and $t =$ the time in years). The student should first have converted the interest rate (3.5%) to a decimal by moving the decimal point two places to the left, resulting in 0.035. Next, the student should have substituted the values $P = 24,820$, $r = 0.035$, and $t = 1$ into the simple interest formula, resulting in $I = (24,820)(0.035)(1) = 868.70$. Alice will pay $868.70 in interest at the end of one year.
	Option G is incorrect	The student likely divided the interest rate by 12 before substituting into the simple interest formula, resulting in $r = \dfrac{3.5\%}{12} \approx 0.29167\%$. The student then likely substituted the values $P = 24,820$, $r = 0.0029167$, and $t = 1$ into the simple interest formula, resulting in $24,820(0.0029167)(1) \approx 72.39$. The student needs to focus on understanding annual interest rates and how to apply annual interest rates to the simple interest formula.
	Option H is incorrect	The student likely did not convert the interest rate from a percentage to a decimal correctly before applying it to the simple interest formula, resulting in $24,820(0.35)(1) = 8,687.00$. The student needs to focus on understanding how to correctly convert percentages to decimals in order to apply annual interest rates to the simple interest formula.
	Option J is incorrect	

Item #	Rationale	
38	Option J is correct	To determine the volume (amount of three-dimensional space) of the rectangular prism in cubic feet, the student could have used the formula for the volume of a prism ($V = Bh$, where $V = $ the volume, $B = $ the area [amount of space covered by a surface] of the base, and $h = $ the height [vertical distance from top to bottom] of the prism). Since the base of the rectangular prism is a rectangle, the student could have calculated the area of the rectangular base as $B = bh$ (where b represents the base of the rectangle and h represents the height of the rectangle), using $b = 1.5$ and $h = 3.5$, obtaining $B = (1.5)(3.5) = 5.25$ square feet. Next, the student could have substituted $B = 5.25$ and $h = 2$ into the volume formula: $V = (5.25)(2) = 10.5$ cubic feet. This is an efficient way to solve the problem; however, other methods could be used to solve the problem correctly.
	Option F is incorrect	The student likely added the given dimensions, resulting in $1.5 + 3.5 + 2 = 7$. The student needs to focus on understanding how to apply the formula for the volume of a rectangular prism when given the dimensions.
	Option G is incorrect	The student likely found the area of the base, B, by multiplying 1.5 by 3.5, but then added 2 to the result instead of multiplying, resulting in $(1.5)(3.5) + 2 = 5.25 + 2 = 7.25$. The student needs to focus on understanding how to apply the formula for the volume of a rectangular prism when given the dimensions.
	Option H is incorrect	The student likely used 3.5 and 2 as the dimensions of the base and then added 1.5 to the result, obtaining $(3.5)(2) + 1.5 = 7 + 1.5 = 8.5$. The student needs to focus on understanding how to apply the formula for the volume of a rectangular prism when given the dimensions.