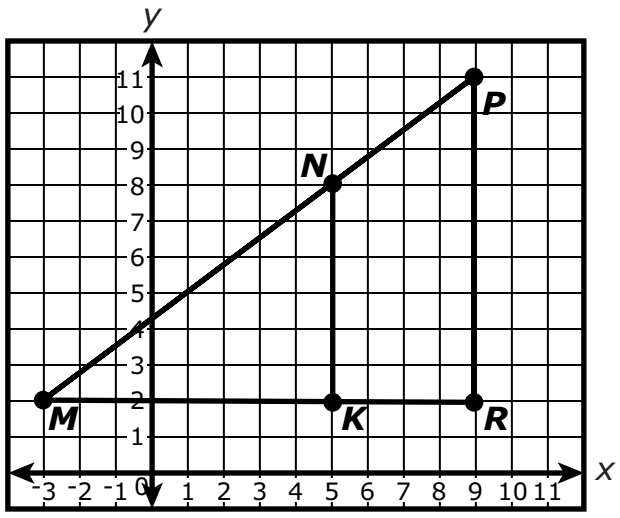
Kentucky Summative Assessments

Grade 8 Mathematics
Released Items
2023

1

MA0820015_4

The coordinate plane shows the locations of triangle *MNK* and triangle *MPR*.



Which statement is true about the line containing points *M*, *N*, and *P*?

A The equation of $\overleftrightarrow{MN}$ is $y = \frac{4}{3}x + 4$, and the equation of $\overleftrightarrow{NP}$ is $y = \frac{4}{3}x + 4$.

B The equation of $\overleftrightarrow{MN}$ is $y = \frac{2}{3}x + 4$, and the equation of $\overleftrightarrow{NP}$ is $y = \frac{2}{3}x + 4$.

C The slope of $\overleftrightarrow{MN}$ is not as steep as the slope of $\overleftrightarrow{NP}$ because the ratio of $\frac{NK}{MK}$ is less than the ratio of $\frac{PR}{MR}$.

D The slope of $\overleftrightarrow{MN}$ is equal to the slope of $\overleftrightarrow{NP}$ because the ratio of $\frac{NK}{MK}$ and the ratio of $\frac{PR}{MR}$ are the same.

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820015*
Book Question Number: 1

Standard: KY.8.EE.6

Item Type: MC
Key: D

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**49,046**	28%	0.28	17%	27%	28%	28%
Gender							
Female	**23,818**	28%	0.28	17%	27%	29%	28%
Male	**25,224**	28%	0.28	18%	27%	27%	28%
Ethnicity							
African American	**5,325**	18%	0.18	20%	30%	32%	18%
American Indian or Alaska Native	**76**	24%	0.24	20%	20%	37%	24%
Asian	**859**	51%	0.51	15%	17%	18%	51%
Hispanic or Latino	**4,226**	22%	0.22	17%	31%	30%	22%
Native Hawaiian or Pacific Islander	**72**	35%	0.35	22%	21%	22%	35%
White (non-Hispanic)	**36,067**	30%	0.30	17%	26%	27%	30%
Two or more races	**2,416**	26%	0.26	17%	28%	28%	26%
Migrant	**212**	21%	0.21	18%	34%	27%	21%
English Learner	**1,917**	15%	0.15	18%	32%	34%	15%
Economically Disadvantaged	**29,134**	22%	0.22	18%	29%	30%	22%
Students with Disabilities	**5,834**	17%	0.17	19%	31%	33%	17%

* Calculator section

2

MA0820023_3

The students in the school band sold cans of popcorn for $5 each and cans of mixed nuts for $8 each. They sold a total of 240 cans for a total of $1,614. How many cans of each type did they sell?

A They sold 194 cans of popcorn and 46 cans of mixed nuts.

B They sold 46 cans of popcorn and 194 cans of mixed nuts.

C They sold 102 cans of popcorn and 138 cans of mixed nuts.

D They sold 138 cans of popcorn and 102 cans of mixed nuts.

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820023*
Book Question Number: 2

Standard: KY.8.EE.8.c

Item Type: MC
Key: C

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**49,057**	57%	0.57	14%	17%	57%	12%
Gender							
Female	**23,817**	57%	0.57	14%	17%	57%	12%
Male	**25,236**	58%	0.58	14%	16%	58%	12%
Ethnicity							
African American	**5,328**	45%	0.45	18%	22%	45%	15%
American Indian or Alaska Native	**76**	63%	0.63	20%	13%	63%	4%
Asian	**859**	75%	0.75	8%	10%	75%	7%
Hispanic or Latino	**4,231**	55%	0.55	14%	18%	55%	13%
Native Hawaiian or Pacific Islander	**72**	51%	0.51	14%	21%	51%	14%
White (non-Hispanic)	**36,072**	59%	0.59	14%	15%	59%	12%
Two or more races	**2,414**	54%	0.54	15%	18%	54%	13%
Migrant	**212**	39%	0.39	19%	24%	39%	18%
English Learner	**1,919**	40%	0.40	19%	26%	40%	16%
Economically Disadvantaged	**29,143**	51%	0.51	16%	19%	51%	14%
Students with Disabilities	**5,835**	39%	0.39	20%	24%	39%	17%

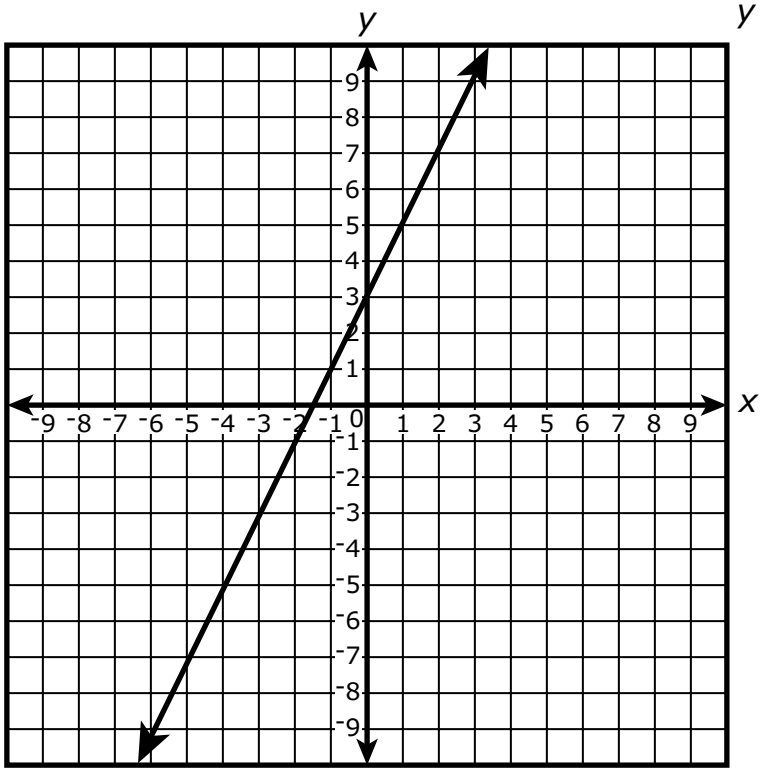
* Calculator section

3

MA0820140

The graph of Function J and the equation of Function K are shown.

Function J



Function K

$y = \frac{5}{2}x - 1$

Which function has the greater rate of change? Explain your answer.

Enter your answer and your explanation in the space provided.

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820140*
Book Question Number: 3

Standard: KY.8.F.2

Item Type: SA
Key: Rubric

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages		
				Score 0 (%)	Score 1 (%)	Score 2 (%)
All Students	**46,468**	25.6%	0.51	66%	16%	17%
Gender						
Female	**22,733**	25.8%	0.52	66%	17%	17%
Male	**23,731**	25.4%	0.51	67%	16%	18%
Ethnicity						
African American	**4,782**	11.6%	0.23	83%	11%	6%
American Indian or Alaska Native	**70**	20.0%	0.40	74%	11%	14%
Asian	**842**	50.3%	1.01	41%	18%	41%
Hispanic or Latino	**3,992**	17.2%	0.34	75%	15%	10%
Native Hawaiian or Pacific Islander	**69**	29.7%	0.59	64%	13%	23%
White (non-Hispanic)	**34,475**	28.2%	0.56	63%	17%	19%
Two or more races	**2,233**	21.2%	0.42	72%	14%	14%
Migrant	**199**	13.1%	0.26	80%	13%	7%
English Learner	**1,766**	7.7%	0.15	88%	9%	3%
Economically Disadvantaged	**27,209**	18.2%	0.36	75%	14%	11%
Students with Disabilities	**5,347**	8.5%	0.17	87%	8%	4%

* Calculator section

Rubric	
Score Point 2	Student demonstrates a complete understanding of comparing properties of two functions, each represented in a different way.
Score Point 1	Student demonstrates a partial understanding of comparing properties of two functions, each represented in a different way.
Score Point 0	Student response is completely incorrect or irrelevant.
Blank	No student response.

Score Points	• Score 2 points:
	  ○ Provides a correct answer to the question and a complete explanation.
	• Score 1 point:
	  ○ Provides the correct slope for one of the two functions. **OR**
	  ○ Provides some work or explanation that shows a minimal understanding of determining the rate of change from a graph or an equation.

Correct Answers	The rate of change of Function K is greater than the rate of change of Function J. The rate of change for Function J is determined by the slope: $m = \frac{1-3}{-1-0} = \frac{-2}{-1} = 2$ OR Equivalent of Counting $\frac{\text{rise}}{\text{run}}$ using two points on the graph, and the rate of change for Function K is given in the equation and is $\frac{5}{2}$, or 2.5, which is greater than 2.

Anchor Set

A1

function k becuse its a line.

Anchor Annotation, Paper 1
Score Point 0

This response receives no credit. None of the required elements are included.

The response provides the correct answer (function k), however, neither slope is identified, and the explanation provided is irrelevant.

Note that selecting Function K is not enough alone to get a score point 1 on this item.

A2

function j

Anchor Annotation, Paper 2
Score Point 0

This response receives no credit. None of the required elements are included.

The response is incorrect. An incorrect answer is given (function j); neither slope is identified, and no explanation is provided.

A3

Function J has the greater rate of change because it is increasing and not ever decreasing and Function K is not increasing.

Anchor Annotation, Paper 3
Score Point 0

This response receives no credit. None of the required elements are included.

The response is incorrect. An incorrect answer is given (Function J has the greater rate of change); neither slope is identified, and the comparison is incorrect (Function J...because it is increasing and not ever decreasing and Function K is not increasing).

A4

Function K has a greater rate of change because $\frac{5}{2}$ is greater than $\frac{2}{1}$.

Anchor Annotation, Paper 4
Score Point 1

The response receives partial credit. It includes one of the two required elements.

- The response provides the correct answer (Function K has a greater rate of change).

A partial explanation is given using the correct values for the slopes to compare; however, neither slope value is connected to a function.

Providing the correct slope for one of the two functions is enough for a score point 1.

Note: If this response had connected either one of the correct fractions to its corresponding function with the correct comparison this response would have been a score point 2.

Compare to Anchor 8 below, where the connections between functions and slopes are made.

A5

Function Khas a greater rate of change,I know that function K has a greater rate of change because it increases at a faster rate then function J does. function J does not increse asfast as function K. thatis why function K has a bigger rate of change.

Anchor Annotation, Paper 5
Score Point 1

The response receives partial credit. It includes one of the two required elements.

- The response provides the correct answer (Function Khas a greater rate of change).

A partial explanation is given that compares the two functions (function K has a greater rate of change because it increases at a faster rate than function J does), however, both slopes are missing.

A6

function K becuase its up 5 over 2 and function J is up 2 over 2

Anchor Annotation, Paper 6
Score Point 1

The response receives partial credit. It includes one of the two required elements.

- The response provides the correct answer and correctly identifies the slope of Function K, (function K becuase its up 5 over 2).

The response is missing a comparison and the slope for Function J is incorrect (function J is up 2 over 2).

Providing the correct slope for one of the two functions is enough for a score point 1.

A7

Function K has a greater rate of change. This is because the slope of Function J is 2, you can tell this by looking at how much the y changes when the x changes by 1. In the graph when x goes from 0 to 1 y goes from 3 to 5 showing the slope is 2. $\frac{5}{2}$ is greater than 2 because $5 \div 2$ is 2.5 and 2.5 > 2.

Anchor Annotation, Paper 7
Score Point 2

The response receives full credit. It includes each of the required elements.

- The response provides the correct answer (Function K has a greater rate of change).
- A complete explanation is given using the correct slopes (the slope of Function J is 2...when x goes from 0 to 1 y goes from 3 to 5 showing the slope is 2) to compare the two functions ($\frac{5}{2}$ is greater than 2).

A8

Function K has a greater rate of change. I looked at the points (0, 3) and (1, 5) for function J and determined the slope of $\frac{2}{1}$, that is a smaller rate of change then $\frac{5}{2}$ because $\frac{5}{2}$ is the bigger fraction.

Anchor Annotation, Paper 8
Score Point 2

The response receives full credit. It includes each of the required elements.

- The response provides the correct answer (Function K has a greater rate of change).
- A complete explanation is given using the correct slopes (function J...slope of $\frac{2}{1}$) to compare the two functions ($\frac{5}{2}$ is the bigger fraction).

A9

The equation has a greater rate of change because its slope is a greater slope than the other equation that is graphed. The equations slope is $2\frac{1}{2}$ and the graphed equation has a slope of 2.

Anchor Annotation, Paper 9
Score Point 2

The response receives full credit. It includes each of the required elements.

- The response provides the correct answer (The equation has a greater rate of change). This statement is considered a unique identifier for Function K, since that is the only function written in equation form.
- A complete explanation is given using the correct slopes (The equations slope is 2 ½ and the graphed equation has a slope of 2) to compare the two functions (because its slope is a greater slope than the other equation that is graphed).

4 MA0820035

Admission to a ride park is $10. Each ride costs $0.75.

Select from the drop-down menus to correctly complete the sentence.

This situation can be represented by a [Choose...] function because

plotting the points in a coordinate plane results in a [Choose...] line.

Item Drop Down Options:

Admission to a ride park is $10. Each ride costs $0.75.

Select from the drop-down menus to correctly complete the sentence.

This situation can be represented by a [✓ Choose... / not linear / linear] function because

plotting the points in a coordinate plan[e] [✓ Choose... / curved / straight / vertical / horizontal] line.

Correct Answer:

Admission to a ride park is $10. Each ride costs $0.75.

Select from the drop-down menus to correctly complete the sentence.

This situation can be represented by a [linear] function because

plotting the points in a coordinate plane results in a [straight] line.

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820035*
Book Question Number: 4

Standard: KY.8.F.3.a

Item Type: TE
Key: see below

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages	
				Score 0 (%)	Score 1 (%)
All Students	**32,308**	50.6%	0.51	49%	51%
Gender					
Female	**15,874**	50.9%	0.51	49%	51%
Male	**16,432**	50.3%	0.50	50%	50%
Ethnicity					
African American	**3,425**	38.2%	0.38	62%	38%
American Indian or Alaska Native	**50**	54.0%	0.54	46%	54%
Asian	**576**	68.2%	0.68	32%	68%
Hispanic or Latino	**2,632**	44.3%	0.44	56%	44%
Native Hawaiian or Pacific Islander	**45**	48.9%	0.49	51%	49%
White (non-Hispanic)	**24,024**	53.0%	0.53	47%	53%
Two or more races	**1,553**	45.1%	0.45	55%	45%
Migrant	**128**	38.3%	0.38	62%	38%
English Learner	**909**	34.9%	0.35	65%	35%
Economically Disadvantaged	**18,875**	44.9%	0.45	55%	45%
Students with Disabilities	**2,343**	40.0%	0.40	60%	40%

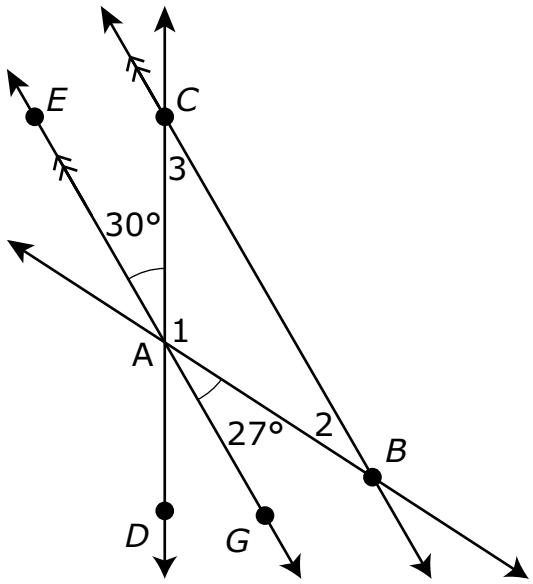
Key: Drop Down 1: should have option 2 chosen. Drop Down 2: should have option 2 chosen.

* Calculator section

5

MA0820058_4,3

In the figure shown, $\overleftrightarrow{CB}$ is parallel to $\overleftrightarrow{EA}$, $m\angle EAC = 30°$, and $m\angle GAB = 27°$.



Which statements are true about the angle relationships in the figure?

Select **two** correct answers.

A $m\angle 1 + m\angle 2 = 180°$

B $m\angle 2 + m\angle 3 = 90°$

C $m\angle DAB = 57°$

D $m\angle 2 = 27°$

E $m\angle 3 = 63°$

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820058*
Book Question Number: 5

Standard: KY.8.G.5

Item Type: MS
Key: C,D

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages		
				Score 0 (%)	Score 1 (%)	Score 2 (%)
All Students	**18,462**	52.0%	1.04	16%	63%	20%
Gender						
Female	**9,064**	51.8%	1.04	16%	64%	20%
Male	**9,396**	52.2%	1.04	17%	62%	21%
Ethnicity						
African American	**1,924**	46.4%	0.93	20%	67%	13%
American Indian or Alaska Native	**29**	55.2%	1.10	14%	62%	24%
Asian	**324**	68.1%	1.36	10%	44%	46%
Hispanic or Latino	**1,487**	49.9%	1.00	17%	66%	17%
Native Hawaiian or Pacific Islander	**32**	53.1%	1.06	28%	38%	34%
White (non-Hispanic)	**13,795**	52.7%	1.05	16%	63%	21%
Two or more races	**868**	52.2%	1.04	15%	66%	19%
Migrant	**58**	41.4%	0.83	28%	62%	10%
English Learner	**523**	43.4%	0.87	23%	68%	10%
Economically Disadvantaged	**10,714**	48.9%	0.98	18%	66%	16%
Students with Disabilities	**1,355**	44.7%	0.89	22%	67%	11%

* Calculator section

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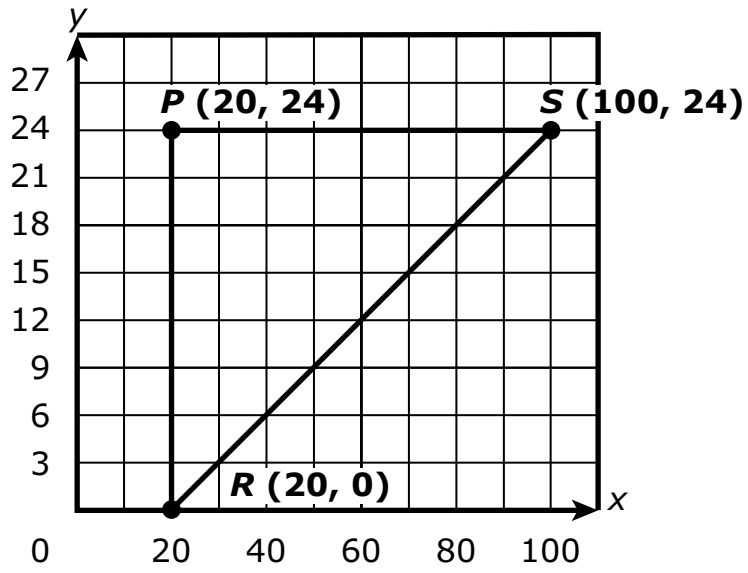
MA0820064_stimulus

Triangle PSR is graphed on a coordinate plane, as shown.



Formulas_8_G_7_8

	Formula
Pythagorean Theorem	$a^2 + b^2 = c^2$

GO ON ▶

6

MA0820064_3

What is the length, to the nearest unit, of $\overline{SR}$?

A 56
B 76
C 84
D 104

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820064*
Book Question Number: 6

Standard: KY.8.G.8

Item Type: MC
Key: C

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**35,442**	44%	0.44	15%	21%	44%	21%
Gender							
Female	**17,121**	44%	0.44	15%	20%	44%	20%
Male	**18,317**	43%	0.43	14%	22%	43%	21%
Ethnicity							
African American	**3,876**	40%	0.40	16%	23%	40%	22%
American Indian or Alaska Native	**55**	49%	0.49	2%	13%	49%	36%
Asian	**612**	58%	0.58	11%	14%	58%	17%
Hispanic or Latino	**3,104**	42%	0.42	15%	23%	42%	20%
Native Hawaiian or Pacific Islander	**58**	52%	0.52	21%	12%	52%	16%
White (non-Hispanic)	**25,985**	44%	0.44	14%	21%	44%	21%
Two or more races	**1,747**	41%	0.41	14%	23%	41%	22%
Migrant	**144**	39%	0.39	10%	24%	39%	28%
English Learner	**1,549**	39%	0.39	16%	23%	39%	22%
Economically Disadvantaged	**21,152**	40%	0.40	16%	22%	40%	22%
Students with Disabilities	**4,879**	37%	0.37	16%	23%	37%	25%

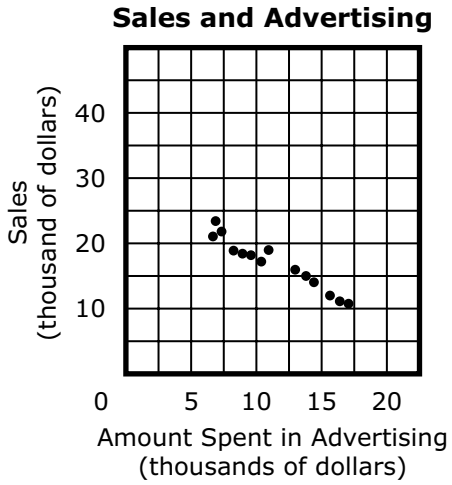
* Calculator section

7

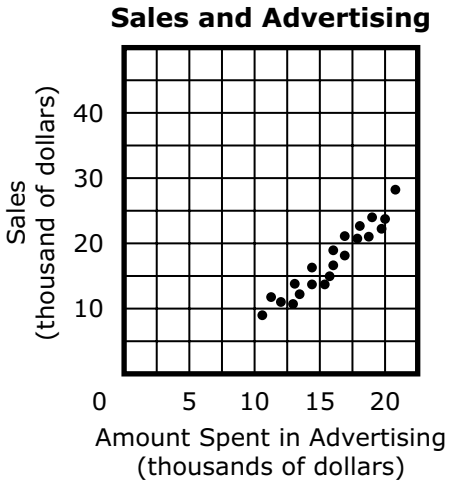
MA0820168_2

Carlos created a scatter plot to determine the relationship between the amount spent, in thousands of dollars, on the advertising of a product and the sales, in thousands of dollars, of the product. The scatter plot that Carlos created shows a positive linear association between the two quantities. Which graph could be the scatter plot Carlos created?

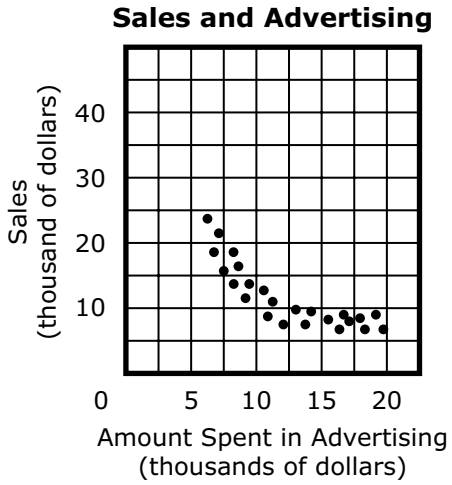
A



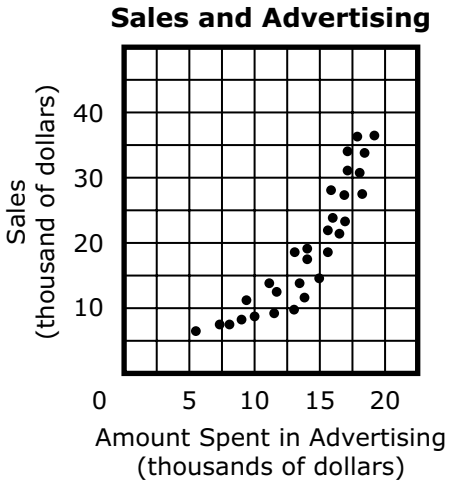
B



C



D



Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820168*
Book Question Number: 7

Standard: KY.8.SP.1

Item Type: MC
Key: B

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**23,006**	57%	0.57	7%	57%	6%	31%
Gender							
Female	**11,356**	56%	0.56	6%	56%	5%	32%
Male	**11,648**	57%	0.57	7%	57%	6%	29%
Ethnicity							
African American	**2,493**	40%	0.40	10%	40%	11%	39%
American Indian or Alaska Native	**32**	66%	0.66	9%	66%	0%	25%
Asian	**421**	70%	0.70	2%	70%	2%	26%
Hispanic or Latino	**1,817**	51%	0.51	7%	51%	7%	35%
Native Hawaiian or Pacific Islander	**32**	53%	0.53	0%	53%	6%	41%
White (non-Hispanic)	**17,104**	59%	0.59	6%	59%	5%	29%
Two or more races	**1,104**	53%	0.53	8%	53%	8%	32%
Migrant	**89**	45%	0.45	12%	45%	7%	36%
English Learner	**633**	41%	0.41	12%	41%	11%	36%
Economically Disadvantaged	**13,479**	51%	0.51	8%	51%	7%	33%
Students with Disabilities	**1,671**	43%	0.43	12%	43%	10%	35%

* Calculator section

8

MA0820100_5,2

The lengths, in inches, of the diagonals of five rectangles are given. Which lengths are irrational numbers?

Select **two** correct answers.

A $\sqrt{100}$

B $\sqrt{111}$

C $\sqrt{121}$

D $\sqrt{144}$

E $\sqrt{150}$

STOP

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 8
Mathematics

Item: MA0820100
Book Question Number: 8

Standard: KY.8.NS.1

Item Type: MS
Key: B,E

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Score Percentages		
				Score 0 (%)	Score 1 (%)	Score 2 (%)
All Students	**30,279**	61.3%	1.23	16%	46%	39%
Gender						
Female	**14,608**	61.5%	1.23	16%	45%	39%
Male	**15,669**	61.1%	1.22	16%	46%	38%
Ethnicity						
African American	**3,334**	51.0%	1.02	22%	54%	24%
American Indian or Alaska Native	**47**	56.4%	1.13	19%	49%	32%
Asian	**534**	76.4%	1.53	8%	31%	61%
Hispanic or Latino	**2,711**	53.7%	1.07	21%	51%	28%
Native Hawaiian or Pacific Islander	**40**	63.8%	1.28	20%	33%	48%
White (non-Hispanic)	**22,087**	63.6%	1.27	15%	44%	42%
Two or more races	**1,524**	59.1%	1.18	17%	47%	36%
Migrant	**151**	50.0%	1.00	23%	55%	23%
English Learner	**1,356**	42.6%	0.85	29%	56%	15%
Economically Disadvantaged	**18,194**	56.6%	1.13	19%	49%	32%
Students with Disabilities	**4,389**	48.5%	0.97	26%	51%	23%

Investing in Kentucky's Future, One Student at a Time