Kentucky Summative Assessments

Grade 7 Mathematics
Released Items
2023

1

MA0720139_2

Terry has a neighborhood lawn business. He charges $4.75 for each $\frac{1}{2}$ hour of work. At the end of one week, he used some of his earnings to buy supplies. The total cost of the supplies was $28.50. After buying the supplies he had $71.25 left from this week's earnings. What was the total number of hours that Terry worked during this week?

A 21
B 10.5
C 9
D 4.5

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720139*
Book Question Number: 1

Standard: KY.7.EE.4.a

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	**46,756**	51%	0.51	29%	51%	11%	8%
Gender							
Female	**22,516**	51%	0.51	29%	51%	11%	9%
Male	**24,239**	52%	0.52	29%	52%	12%	7%
Ethnicity							
African American	**5,066**	47%	0.47	25%	47%	15%	12%
American Indian or Alaska Native	**62**	48%	0.48	27%	48%	13%	11%
Asian	**898**	55%	0.55	30%	55%	8%	7%
Hispanic or Latino	**4,074**	49%	0.49	28%	49%	13%	10%
Native Hawaiian or Pacific Islander	**84**	50%	0.50	21%	50%	21%	7%
White (non-Hispanic)	**34,194**	52%	0.52	30%	52%	10%	7%
Two or more races	**2,377**	50%	0.50	29%	50%	13%	8%
Migrant	**229**	49%	0.49	28%	49%	13%	10%
English Learner	**2,044**	50%	0.50	22%	50%	15%	13%
Economically Disadvantaged	**28,201**	50%	0.50	29%	50%	12%	9%
Students with Disabilities	**6,114**	52%	0.52	23%	52%	13%	11%

* Calculator section

2

MA0719002_4

A truck that is used to carry bundles of bricks weighs 6,100 lbs. A bundle of bricks weighs approximately 620 lbs. The truck must cross a bridge that can safely hold no more than 10,000 lbs. Which inequality can be used to determine the number of bundles of bricks, x, the truck can safely carry across the bridge?

A $6{,}720x \geq 10{,}000$

B $6{,}720x \leq 10{,}000$

C $620x + 6{,}100 \geq 10{,}000$

D $620x + 6{,}100 \leq 10{,}000$

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0719002*
Book Question Number: 2

Standard: KY.7.EE.4.b

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	**46,727**	33%	0.33	13%	28%	26%	33%
Gender							
Female	**22,502**	32%	0.32	13%	28%	27%	32%
Male	**24,224**	34%	0.34	13%	28%	25%	34%
Ethnicity							
African American	**5,064**	21%	0.21	14%	32%	33%	21%
American Indian or Alaska Native	**62**	34%	0.34	18%	27%	21%	34%
Asian	**896**	49%	0.49	10%	21%	21%	49%
Hispanic or Latino	**4,070**	26%	0.26	14%	29%	31%	26%
Native Hawaiian or Pacific Islander	**84**	20%	0.20	17%	35%	29%	20%
White (non-Hispanic)	**34,174**	35%	0.35	13%	27%	25%	35%
Two or more races	**2,376**	29%	0.29	14%	30%	27%	29%
Migrant	**229**	22%	0.22	17%	28%	32%	22%
English Learner	**2,043**	17%	0.17	17%	30%	37%	17%
Economically Disadvantaged	**28,177**	27%	0.27	14%	30%	29%	27%
Students with Disabilities	**6,112**	23%	0.23	16%	30%	31%	23%

* Calculator section

MA0720063_stimulus

A water fountain[1] is located in the center of a circular walking path. The approximate distance around the outside edge of the walking path is 126 feet.

Formulas_7_G_4

Figure	Area	Circumference
Circle	$A = \pi r^2$	$C = \pi d$ $C = 2\pi r$

[1]fountain – A structure from which one or more jets of water are pumped into the air.

3

MA0720063_1

What is the approximate distance, in feet, from a point on the outside edge of the walking path to the center of the fountain?

A 20

B 30

C 40

D 60

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720063*
Book Question Number: 3

Standard: KY.7.G.4.b

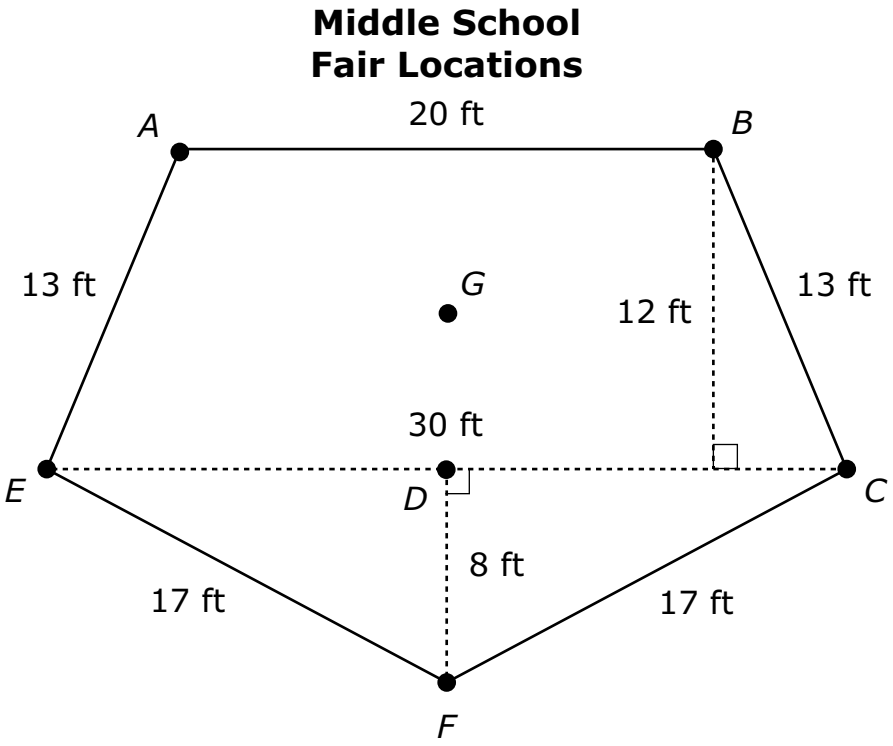
Item Type: MC
Key: A

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**37,862**	21%	0.21	21%	25%	33%	20%
Gender							
Female	**18,161**	21%	0.21	21%	25%	33%	21%
Male	**19,700**	21%	0.21	21%	26%	34%	20%
Ethnicity							
African American	**4,102**	15%	0.15	15%	29%	36%	20%
American Indian or Alaska Native	**52**	19%	0.19	19%	25%	35%	21%
Asian	**721**	34%	0.34	34%	18%	28%	19%
Hispanic or Latino	**3,344**	17%	0.17	17%	29%	35%	19%
Native Hawaiian or Pacific Islander	**65**	17%	0.17	17%	23%	29%	31%
White (non-Hispanic)	**27,659**	22%	0.22	22%	25%	33%	21%
Two or more races	**1,918**	20%	0.20	20%	25%	35%	21%
Migrant	**193**	13%	0.13	13%	32%	33%	22%
English Learner	**1,752**	14%	0.14	14%	30%	35%	20%
Economically Disadvantaged	**22,866**	17%	0.17	17%	27%	34%	21%
Students with Disabilities	**5,398**	18%	0.18	18%	27%	33%	22%

* Calculator section

MA0720C4_00

Seven students at a middle school fair[1] each present different information about their school. The diagram shows the locations of each student at the fair. The locations are labeled with points A, B, C, D, E, F, and G.



Formulas_7_G_6_a

Figure	Formula
Triangle	$A = \frac{1}{2}bh$
Rectangle	$A = lw$
Trapezoid	$A = \frac{1}{2}(a + b)h$

[1]fair – an event organized by a school

4

MA0720C4_01_1

The principal uses the diagram to determine which area in the school would be large enough to accommodate the fair. What is the minimum amount of floor space, in square feet, that is needed for the fair?

A 420

B 480

C 618

D 645

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720C4_01*
Book Question Number: 4

Standard: KY.7.G.6.a

Item Type: MC
Key: A

Student Group	Number of Students	Percent Correct	Average Item Score	Item Breakout Statistics - Answer Choice Options			
				A (%)	B (%)	C (%)	D (%)
All Students	**37,911**	30%	0.30	30%	34%	25%	11%
Gender							
Female	**18,187**	30%	0.30	30%	34%	25%	11%
Male	**19,723**	30%	0.30	30%	34%	25%	11%
Ethnicity							
African American	**4,109**	25%	0.25	25%	36%	27%	12%
American Indian or Alaska Native	**52**	29%	0.29	29%	35%	29%	8%
Asian	**724**	41%	0.41	41%	30%	21%	8%
Hispanic or Latino	**3,351**	26%	0.26	26%	36%	27%	11%
Native Hawaiian or Pacific Islander	**65**	22%	0.22	22%	38%	31%	9%
White (non-Hispanic)	**27,685**	31%	0.31	31%	34%	25%	11%
Two or more races	**1,924**	28%	0.28	28%	33%	27%	12%
Migrant	**193**	25%	0.25	25%	36%	25%	13%
English Learner	**1,754**	24%	0.24	24%	39%	26%	11%
Economically Disadvantaged	**22,893**	27%	0.27	27%	34%	27%	12%
Students with Disabilities	**5,399**	27%	0.27	27%	33%	25%	15%

* Calculator section

5

MA0720015

A company received four orders for the same type of calculator. The table shows the number of calculators and the total cost for each order.

Calculators Ordered

Number of Calculators	Total Cost (dollars)
45	396
55	484
30	264
60	528

- Write an equation that represents the relationship between the number of calculators ordered and the total cost, in dollars.
- Explain how your equation represents the data in the table.

Enter your equation and your explanation in the space provided.

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720015*
Book Question Number: 5

Standard: KY.7.RP.2.c

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	**31,669**	21.5%	0.43	64%	29%	7%
Gender						
Female	**15,250**	23.2%	0.46	61%	31%	8%
Male	**16,418**	19.9%	0.40	66%	27%	6%
Ethnicity						
African American	**3,303**	11.5%	0.23	80%	17%	3%
American Indian or Alaska Native	**44**	19.3%	0.39	61%	39%	0%
Asian	**616**	36.8%	0.74	46%	35%	19%
Hispanic or Latino	**2,807**	17.2%	0.34	70%	26%	4%
Native Hawaiian or Pacific Islander	**60**	18.3%	0.37	68%	27%	5%
White (non-Hispanic)	**23,240**	23.2%	0.46	61%	31%	8%
Two or more races	**1,598**	19.1%	0.38	68%	27%	6%
Migrant	**179**	14.5%	0.29	74%	22%	3%
English Learner	**1,482**	9.0%	0.18	83%	15%	1%
Economically Disadvantaged	**19,047**	16.4%	0.33	71%	25%	4%
Students with Disabilities	**4,534**	8.6%	0.17	85%	13%	2%

* Calculator section

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Rubric	
Score Point 2	Student demonstrates a complete understanding of representing a proportional relationship with an equation.
Score Point 1	Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task.
Score Point 0	Student response is insufficient to demonstrate a grade-appropriate, relevant understanding of the task.
Blank	No student response.

Score Points	• Score 2 points:
	  ○ Correct equation with a complete justification for the equation.
	• Score 1 point:
	  ○ Correct equation with a partial justification for the equation. **OR**
	  ○ Nearly complete justification that contains a minor error that results in an incorrect but reasonable proportional equation.
	  ○ No equation is given but includes valid work or explanation to determine the unit rate of the calculators.

Correct Answers	$C = 8.80n$ The two quantities have a proportional relationship. I know this because all of the ratios are equivalent, and when $n = 0$, $c = 0$. $\frac{396}{45} = 8.8; \frac{484}{55} = 8.8; \frac{264}{30} = 8.8; \frac{528}{60} = 8.8$ The unit rate is 8.8, which means that the price per calculator is \$8.80. The equation shows that the total cost of the calculators, c, is dependent on the number of calculators, n.

Anchor Set

A1

$d = x + n$

Mybequation represents the data in the table like this. 1 calculator x ia 8.80, Your dollars d equal *x* plus your amount of x n

Anchor Annotation, Paper 1
Score Point 0

This response receives no credit. It includes none of the two required elements.

The equation shown does not include a proportional relationship since the cost of one calculator is added to the number of calculators to arrive at the total cost.

A2

396 – 45 = 351

Anchor Annotation, Paper 2
Score Point 0

This response receives no credit. It includes none of the two required elements.

The equation shown does not include a proportional relationship.

A3

each number is going up by at least 150 – 350 to get the answer

Anchor Annotation, Paper 3
Score Point 0

This response receives no credit. It includes none of the two required elements.

No equation is included, and no proportional relationship is shown.

A4

The equation I found is $\frac{484-396}{55-45}$ to get \$8.80. This means 8.80 is the constant of proportionality, and in the problem, represents the cost of each calculator bought.

Anchor Annotation, Paper 4
Score Point 1

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

- The student included the work to determine the unit rate by determining the change in cost between 45 and 55 calculators ($\frac{484-396}{55-45}$ to get \$8.80. This means 8.80 is the constant of proportionality...the cost of each calculator).

No proportional equation is shown representing the relationship of the independent and dependent variables.

A5

The equation would be $d = 8.36c$ with d representing money and c representing the amount of calculators this shows the unit cost/rate

Anchor Annotation, Paper 5
Score Point 1

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

- The student includes an incorrect equation (d = 8.36c) with the variables defined (d representing money and c representing the amount of calculators).

The incorrect unit rate (unit cost/rate) shown in the equation (8.36) drops the response from complete justification to partial justification.

No justification for determining the unit rate based on the values of a single data point from the table is shown.

A6

number of caculators= c total cost = d constant=x

$cx = d$. My equation represents the situation because c the number of caculators times the constant x equals d the answer.

Anchor Annotation, Paper 6
Score Point 1

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

- The student has included an equation (cx = d) with variables defined (number of caculators= c total cost = d constant=x).

The student has restated the equation (c the number of caculators times the constant x equals d the answer) which could be identified as a partial explanation. The unit rate is not determined or shown which would provide the explanation required for credit.

A7

. $\{n \times 8.80\} = t$
. My equation represents the data in the table because 'n' represents the number of calculators bought times 8.80 which is how much 1 calcualtor costs which equals 't' or the total cost. For example..
$45 \times 8.80 = 396$
$55 \times 8.8 = 484$
$30 \times 8.8 = 264$
$60 \times 8.8 = 528.$

Anchor Annotation, Paper 7
Score Point 2

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

- The student has included an equation ({n × 8.80} = t) with variables defined (‘n’ represents the number of calculators bought; ‘t’ or the total cost).

- The justification for determining the unit rate is included (45 × 8.80 = 396; 55 × 8.8 = 484; 30 × 8.8 = 264; 60 × 8.8 = 528). Note that, since the rate is the same for each order, data from any row would be acceptable for justification.

A8

$Y = 8.8x$
I divided 396 by 45 and got 8.8 and that is the constant/relationship

Anchor Annotation, Paper 8
Score Point 2

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

- The student has included an equation (Y = 8.8x).
- The justification for determining the unit rate is included (I divided 396 by 45).

A9

An equation that represents the relationship between the number of calculators ordered, c, and the total cost, in dollars, d, is $d \div c = 8.8$. This equation represents the data in the table because if you divide 396 by 45, you get 8.8. You also get 8.8 if you divide 484 by 55. This is dividing the cost by the number calculators like in the equation. This keeps going on down the table, which tells us each calculator is 8 dollars and 80 cents, and that's what the 8.8 represents in the equation.

Anchor Annotation, Paper 9
Score Point 2

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

- The student has included an equation (d ÷ c = 8.8) with variables defined (number of calculators ordered, c, and the total cost, in dollars, d).
- The justification for determining the unit rate is included (if you divide 396 by 45, you get 8.8. You also get 8.8 if you divide 484 by 55. This is dividing the cost by the number of calculators).

6

MA0720080_2

Students select a calculator from a box without looking into the box. There are 14 blue calculators, 8 black calculators, 6 yellow calculators, and 2 pink calculators in the box. What is the probability of the first student selecting a pink calculator from the box?

A likely

B unlikely

C impossible

D neither likely nor unlikely

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720080
Book Question Number: 6

Standard: KY.7.SP.5

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	**30,897**	84%	0.84	6%	84%	4%	6%
Gender							
Female	**15,124**	82%	0.82	7%	82%	5%	7%
Male	**15,773**	86%	0.86	5%	86%	4%	5%
Ethnicity							
African American	**3,239**	70%	0.70	13%	70%	8%	10%
American Indian or Alaska Native	**34**	91%	0.91	3%	91%	6%	0%
Asian	**604**	86%	0.86	4%	86%	5%	5%
Hispanic or Latino	**2,560**	75%	0.75	8%	75%	8%	9%
Native Hawaiian or Pacific Islander	**57**	72%	0.72	9%	72%	7%	12%
White (non-Hispanic)	**22,789**	87%	0.87	5%	87%	4%	5%
Two or more races	**1,614**	84%	0.84	7%	84%	4%	6%
Migrant	**125**	66%	0.66	15%	66%	10%	10%
English Learner	**1,022**	59%	0.59	17%	59%	13%	11%
Economically Disadvantaged	**18,334**	80%	0.80	8%	80%	5%	7%
Students with Disabilities	**2,642**	69%	0.69	15%	69%	8%	9%

MA0720177

7 Students in a science class raced three remote control cars. There was one winner in each race. The results of the races are shown in the table.

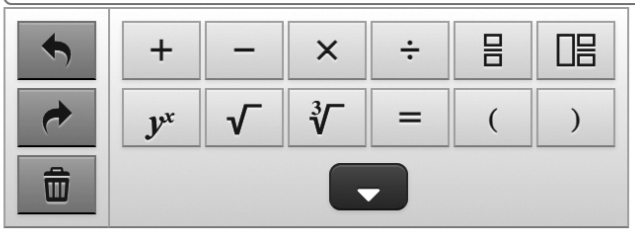
Race Results

Car Color	Total Number of Wins
Green	28
Blue	32
Red	20

Based on the results shown in the table, what is the probability of the red car winning the next race?

Enter **only** your answer in the space provided.

$\mathrm{P}(\text{red car}) = \square$



Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720177*
Book Question Number: 7

Standard: KY.7.SP.7.b

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	**30,793**	39.8%	0.40	60%	40%
Gender					
Female	**15,076**	39.6%	0.40	60%	40%
Male	**15,717**	40.0%	0.40	60%	40%
Ethnicity					
African American	**3,216**	20.6%	0.21	79%	21%
American Indian or Alaska Native	**34**	47.1%	0.47	53%	47%
Asian	**603**	61.5%	0.62	38%	62%
Hispanic or Latino	**2,549**	29.7%	0.30	70%	30%
Native Hawaiian or Pacific Islander	**57**	29.8%	0.30	70%	30%
White (non-Hispanic)	**22,726**	43.6%	0.44	56%	44%
Two or more races	**1,608**	33.1%	0.33	67%	33%
Migrant	**124**	21.8%	0.22	78%	22%
English Learner	**1,014**	14.7%	0.15	85%	15%
Economically Disadvantaged	**18,258**	31.9%	0.32	68%	32%
Students with Disabilities	**2,631**	22.4%	0.22	78%	22%

Key: Correct response is 0.25. Note: Equivalent numbers are acceptable.

* Calculator section

8

MA0720030_3

A teacher creates a list of art supplies he wants to order during the school year. The list shows the cost of the art supplies for each order.

- Order A: $143.50
- Order B: $58.95
- Order C: $168.05

The teacher sells candy bars during the year for $0.75 each to raise money to pay for $\frac{2}{5}$ of the total cost of the art supplies. What is the minimum number of candy bars the teacher needs to sell?

A 124
B 149
C 198
D 223

STOP

Released Item Performance

Kentucky Summative Assessments

Spring 2023
Grade 7
Mathematics

Item: MA0720030*
Book Question Number: 8

Standard: KY.7.NS.3

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	**38,061**	39%	0.39	14%	32%	39%	15%
Gender							
Female	**18,205**	39%	0.39	14%	30%	39%	17%
Male	**19,855**	38%	0.38	14%	33%	38%	14%
Ethnicity							
African American	**4,186**	33%	0.33	17%	34%	33%	16%
American Indian or Alaska Native	**53**	38%	0.38	6%	40%	38%	17%
Asian	**739**	51%	0.51	10%	29%	51%	10%
Hispanic or Latino	**3,351**	36%	0.36	15%	33%	36%	16%
Native Hawaiian or Pacific Islander	**68**	38%	0.38	21%	28%	38%	13%
White (non-Hispanic)	**27,748**	39%	0.39	14%	31%	39%	15%
Two or more races	**1,915**	37%	0.37	16%	33%	37%	15%
Migrant	**186**	37%	0.37	13%	31%	37%	19%
English Learner	**1,773**	32%	0.32	17%	34%	32%	17%
Economically Disadvantaged	**23,048**	36%	0.36	15%	32%	36%	17%
Students with Disabilities	**5,418**	31%	0.31	17%	31%	31%	21%

* Calculator section

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