NAEP 2013
Released Questions & Performance Data

NAEP
DELAWARE
NATIONAL ASSESSMENT
OF EDUCATIONAL
PROGRESS
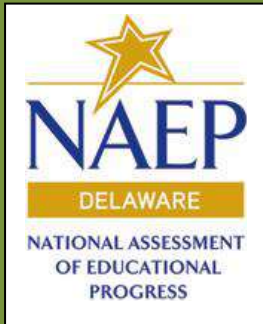
Mathematics
Grade 8

The Mathematics Assessment

The NAEP mathematics assessment measures what students across the country know and are able to do in mathematics. Assessment questions are classified in two dimensions: content area and mathematical complexity. This booklet contains actual items from the 2013 NAEP assessments at grades 4 and 8.

NAEP questions are anchored in five broad areas of mathematical content:

    (1) Number Properties and Operations;
    (2) Measurement;
    (3) Geometry;
    (4) Data Analysis, Statistics, and Probability; and
    (5) Algebra

Each item also makes certain demands on students' thinking, which determines the mathematical complexity of an item. Item complexity is assigned by one of three levels - low, moderate, or high.

The NAEP Mathematics Assessment contains multiple-choice questions, as well as short and extended constructed-response questions. Testing time on NAEP is divided evenly between multiple-choice and both types of constructed-response questions.

NAEP Mathematics Framework
Distribution of Item Pool Across Contexts

	Grade 8
Number Properties and Operations	20%
Measurement	15%
Geometry	20%
Data Analysis, Statistics, and Probability	15%
Algebra	30%

More information about the NAEP released questions and performance data for students, visit the NAEP Questions Tool at http://nces.ed.gov/nationsreportcard/itmrlsx/

For more information regarding the assessment frameworks, please visit
http://www.nagb.org/publications/frameworks.htm

Each item within this document appears as it did during the NAEP 2013 administration. Additionally, each question is accompanied by a table that includes a description of the item and specific item details: grade level, difficulty level, item complexity, and content area.

Example of Question Details:

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Multiply three whole numbers		Content Area	Number Properties and Operations	

NAEP Item Difficulty Level and Complexity	
Difficulty Level	• Easy – answered correctly by 60% or more students • Medium – answered correctly by 40% to 59% of students • Hard – answered correctly by fewer than 40% of students
Complexity	• Low – items requiring recall and recognition of previously learned concepts and principles • Moderate – items requiring more flexibility of thinking as well as informal methods of reasoning and problem solving • High – items that require more abstract thinking, planning, analysis, and creative thought

Each question also includes performance data for students in Delaware and the results for public students nationally. The example below illustrates the average scale score for students who selected each letter choice option and the percent of students who selected each option.

All Students – Performance Data										* Denotes the correct answer
	A		B		C*		D		E	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	218	7	219	10	249	75	224	5	227	3
Delaware	‡	4	‡	10	251	76	‡	6	‡	3

‡ Reporting standards not met.

† Not applicable.

For short and extended response questions, each question is scored by hand and performance data is reported by how well the students answered based upon a pre-established rubric.

All Students – Performance Data										
	Incorrect		Partial		Correct		Omitted		Off task	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	234	52	248	15	262	32	225	1	‡	#
Delaware	234	51	‡	14	263	35	‡	1	‡	#

More information on the NAEP scoring process is available at
http://nces.ed.gov/nationsreportcard/contracts/item_score.asp

$$\overline{}$$

A   B

47. What is the length of segment *AB* shown above?

A. 0.52 millimeter
B. 0.52 centimeter
C. 5.2 millimeters
D. 5.2 centimeters
E. 520 millimeters

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Measure length of a line segment			Content Area	Measurement

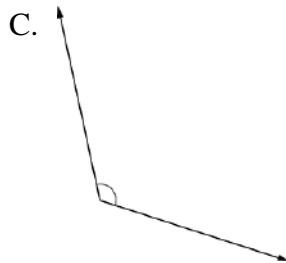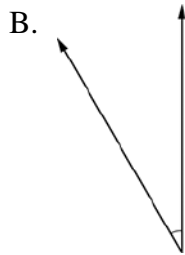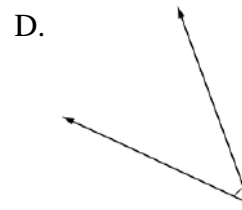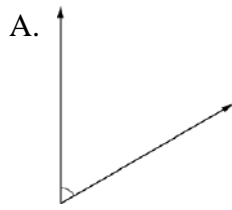| All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D*		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	265	4	256	7	257	5	290	80	285	2	269	1
Delaware	‡	4	‡	6	‡	3	288	84	‡	1	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

48. A nickel, a dime, and a quarter are flipped at the same time. Each coin can land either heads up (H) or tails up (T). List all the different possible outcomes for this event in the chart below. The list has been started for you.

Nickel	Dime	Quarter
H	H	H
H	H	T

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Low
Description	Determine complete sample space			Content Area	Data Analysis & Prob.

All Students – Performance Data										
	Incorrect		Partial		Correct		Omitted		Off task	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	261	28	289	43	312	26	246	3	‡	#
Delaware	262	27	283	44	308	29	‡	1	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

49. In the map above, which two streets appear to be <u>perpendicular</u> to each other?

A. Hillside Way and Lake Street
B. Lake Street and Park Avenue
C. Park Avenue and Hillside Way
D. Main Street and Hillside Way
E. Main Street and Park Avenue

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Identify perpendicular streets			Content Area	Geometry

All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D		E*		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	274	30	265	3	261	2	260	2	292	63	260	#
Delaware	273	31	‡	3	‡	3	‡	2	292	60	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

50. Which pair of rays forms an angle of 30 degrees?

A.

D.

B.

E.

C.

All Students – Performance Data												* Denotes the correct answer	
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	266	7	292	75	251	3	267	8	265	6	270	1
Delaware	‡	9	291	74	‡	4	‡	9	‡	2	‡	2

‡ Reporting standards not met.
† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.
SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

51. Rima and Eric have earned a total of 135 tokens to buy items at the school store. The ratio of the number of tokens that Rima has to the number of tokens that Eric has is 8 to 7. How many tokens does Rima have?

A. 8
B. 15
C. 56
D. 72
E. 120

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Solve a story problem using ratios			Content Area	Number Properties and Operations

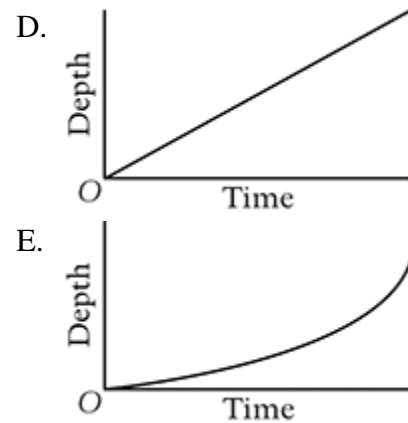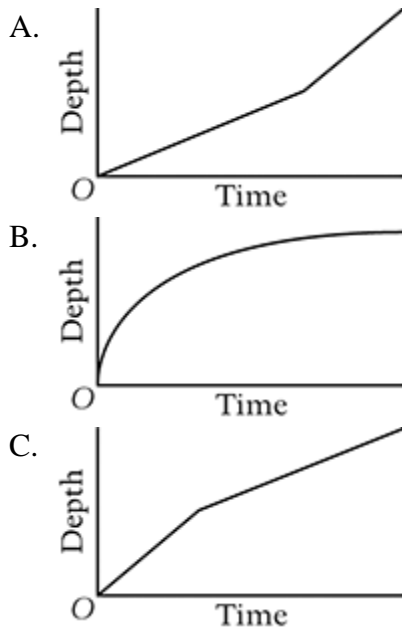	All Students – Performance Data											* Denotes the correct answer
	A		B		C		D*		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	272	7	262	10	275	24	303	42	272	14	278	3
Delaware	‡	7	‡	8	275	23	302	40	275	19	‡	3

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

52. Points A and B are on a number line. The coordinate of point B is 3 and the coordinate of the midpoint of segment AB is -5. What is the coordinate of point A ?

A. -13

B. -2

C. -1

D. 8

E. 11

Question Details				
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Find coordinate of point using midpoint		Content Area	Geometry

All Students – Performance Data												* Denotes the correct answer
	A*		B		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	306	46	266	30	269	8	264	12	267	1	27	2
Delaware	304	48	268	28	‡	8	‡	12	‡	1	‡	3

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

53. Rick has earned a total of 581 points on all of his science tests. His overall test average (mean) is 83. How many tests has Rick taken?

A. 6
B. 7
C. 8
D. 9
E. 10

54. Martine is filling a rectangular fish tank using two hoses that fill the tank at the same flow rate. When the tank is about half full, she turns off one hose but does not change the flow rate of the other hose. Which of the following graphs best represents how the depth of the water in the tank changes over time?

A.

B.

C.

D.

E.

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Identify graph representing a situation			Content Area	Algebra

| All Students – Performance Data											* Denotes the correct answer	
	A		B		C*		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	269	10	274	18	299	51	270	15	264	4	268	2
Delaware	‡	9	271	17	300	52	272	15	‡	6	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

55. In which of the following equations does the value of y increase by 6 units when x increases by 2 units?

A. $y = 3x$

B. $y = 4x$

C. $y = 6x$

D. $y = 4x + 2$

E. $y = 6x + 2$

56. Last month Bonnie recorded the weights of 11 dogs. Statistics for these weights are given below.

WEIGHTS OF DOGS LAST MONTH

Minimum	31 pounds
Maximum	93 pounds
Mean	81 pounds
Mode	88 pounds
First Quartile	78 pounds
Median	88 pounds
Third Quartile	90 pounds

This month, Bonnie weighed the 11 dogs again. The weight of one dog changed from 31 pounds to 27 pounds. The weights of all the other dogs stayed the same.

Which of the following statistics changed from last month to this month?

A. Maximum
B. Mean
C. Mode
D. First Quartile
E. Median

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Identify effect of outlier on statistics			Content Area	Data Analysis and Prob.

All Students – Performance Data												* Denotes the correct answer	
	A		B*		C		D		E		Omitted		
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	
National Public	263	18	301	52	267	9	269	12	275	6	276	2	
Delaware	263	15	299	54	‡	9	271	13	‡	6	‡	3	

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

57. The Atwood family sells firewood. They keep track of how their weekly income varies with the price they set for the firewood. In the graph below, the relationship between the price per truckload and weekly income is modeled by the curve.

FIREWOOD INCOME
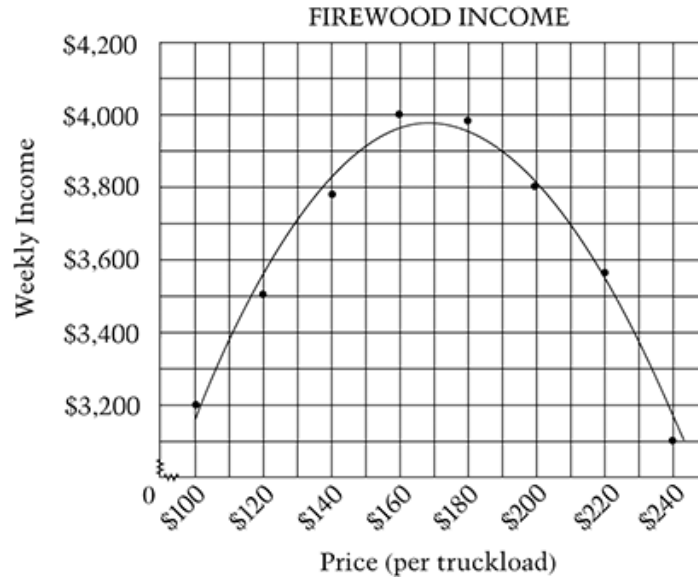
About how many truckloads of firewood would the Atwood family expect to sell at $170 per truckload?

Answer:_____

Show how you found your answer.

58. The figure above shows a game board. What is the measure, in degrees, of the largest section of the board?

Answer: _____

59. On a floor plan, a length of 1 inch represents 4 feet. Which of the following segments would represent an 11-foot-long wall on this floor plan?

(You may need a ruler to complete this item.)

A. _____

B. _____

C. _____

D. _____

E. _____

60. Archaeologists measure the lengths of certain bones to estimate a dinosaur's height. When the length t of the tibia, or leg bone, is known, a dinosaur's height h can be estimated by the following formula, where t and h are in centimeters.

$$h = 73 + 2.5t$$

If the length of the tibia of a certain dinosaur is 400 centimeters, what is its estimated height in centimeters?

  A. 402.5
  B. 473
  C. 475.5
  D. 1,000
  E. 1,073

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Use algebraic model to estimate height			Content Area	Algebra

All Students – Performance Data											* Denotes the correct answer
	A		B		C		D		E*		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	259	11	265	11	266	22	284	13	309	41	273	2
Delaware	‡	11	‡	14	270	26	‡	13	311	34	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

61. Fill in the table below so that the points with coordinates (*x, y*) all lie on the same line.

x	y
1	3
2	
3	
4	15

62. The length of a photograph is 5 inches and its width is 3 inches. The photograph is enlarged proportionally. The length of the enlarged photograph is 10 inches. What is the width of the enlarged photograph?

A. 6 inches
B. 7 inches
C. 9 inches
D. 15 inches
E. $16\frac{2}{3}$ inches

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Determine width after proportional enlargement			Content Area	Measurement

All Students – Performance Data												* Denotes the correct answer	
	A*		B		C		D		E		Omitted		
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	296	74	257	7	256	5	248	11	242	3	264	1
Delaware	289	77	‡	6	‡	3	‡	10	‡	4	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

63. A car can seat c adults. A van can seat 4 more than twice as many adults as the car can. In terms of c, how many adults can the van seat?

A. $c + 8$

B. $c + 12$

C. $2c - 4$

D. $2c + 4$

E. $4c + 2$

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Identify algebraic expression modeling a scenario			Content Area	Algebra

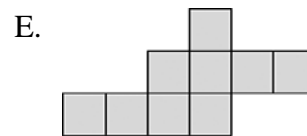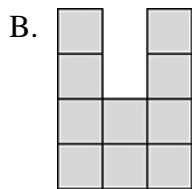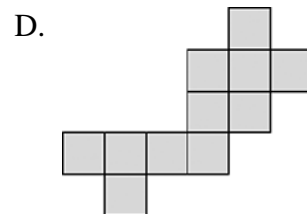	All Students – Performance Data											* Denotes the correct answer
	A		B		C		D*		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	253	14	253	4	261	3	297	69	257	10	262	1
Delaware	256	15	‡	8	‡	3	292	62	‡	11	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.
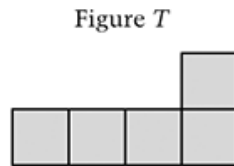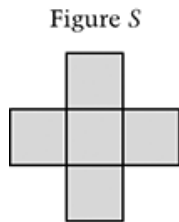
Figure S Figure T

64. Figures S and T shown above are two pieces of a puzzle. Which of the following figures could be made by fitting figures S and T together?

A.

B.

C.

D.

E.
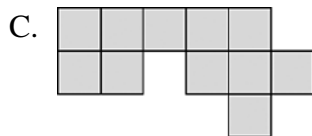
Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Moderate
Description	Identify result of combining two shapes			Content Area	Geometry

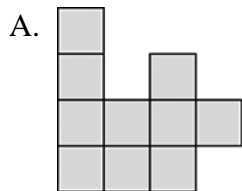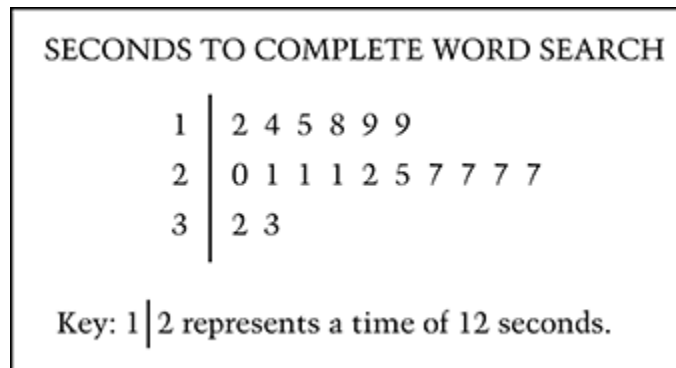| All Students – Performance Data											* Denotes the correct answer	
	A*		B		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	290	83	249	2	261	5	253	4	258	4	263	1
Delaware	284	85	‡	2	‡	5	‡	4	‡	3	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

The stem-and-leaf plot below shows the number of seconds it took each student in a class of 18 to complete a word search.

SECONDS TO COMPLETE WORD SEARCH

```
1 | 2 4 5 8 9 9
2 | 0 1 1 1 2 5 7 7 7 7
3 | 2 3
```

Key: 1|2 represents a time of 12 seconds.

65. How many students took more than 25 seconds to complete the word search?

A. 4
B. 5
C. 6
D. 7
E. 10

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Low
Description	Read and interpret a stem-and-leaf plot			Content Area	Data Analysis and Prob.

All Students – Performance Data												
	A		B		C*		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	261	7	268	11	296	58	269	12	271	10	277	2
Delaware	‡	6	‡	4	287	74	269	12	‡	4	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

66. One side of a rectangle is 14 meters. The perimeter of the rectangle is 44 meters. What is the area of this rectangle?

A. 22 square meters
B. 64 square meters
C. 112 square meters
D. 121 square meters
E. 196 square meters

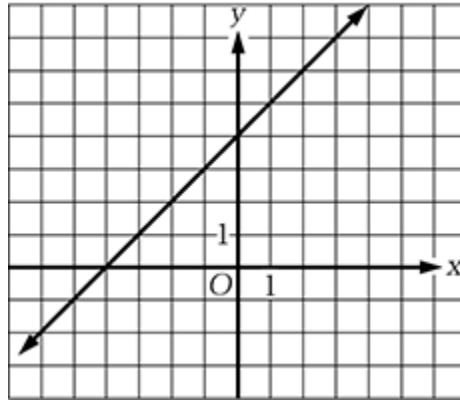| Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Determine area of figure, given side length and perimeter			Content Area	Measurement

All Students – Performance Data											* Denotes the correct answer	
	A		B		C*		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	263	9	262	18	303	46	273	10	273	13	278	4
Delaware	‡	11	267	23	296	40	‡	9	273	15	‡	3

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

67. In which of the following groups do all the ordered pairs lie on the line shown above?

A. (7, 3), (6, 2), (2, -2)
B. (5, 1), (3, 7), (2, 6)
C. (3, 7), (2, 6), (2, 2)
D. (3, 7), (2, 6), (-2, 2)
E. (1, 5), (-6, 2), (-7, -3)

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Low
Description	Identify collinear points			Content Area	Algebra

| All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D*		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	269	11	257	9	261	9	299	57	270	11	267	2
Delaware	268	13	259	17	‡	9	297	46	268	12	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.
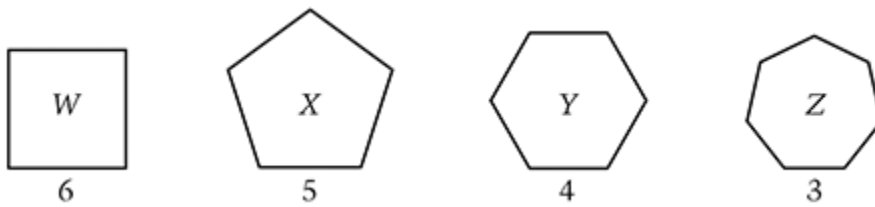
68. In each polygon shown above, the lengths of all sides are equal. The length of one side of each polygon is indicated. Which two polygons have the same perimeter?

A. W and X
B. W and Y
C. W and Z
D. X and Y
E. X and Z

All Students – Performance Data												* Denotes the correct answer
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	259	7	300	59	269	11	258	17	257	5	265	1
Delaware	‡	8	296	54	‡	11	258	20	‡	6	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.
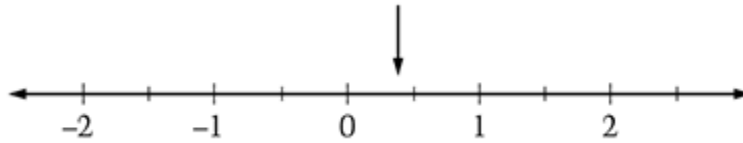
69. On the number line above, the arrow is pointing to a number that is closest to which of the following?

A. 0.20
B. 0.37
C. 0.62
D. 0.75
E. 1.62

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Approximate value on a number line			Content Area	Number Properties and Operations

All Students – Performance Data											* Denotes the correct answer	
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	248	10	294	74	259	4	263	10	234	1	257	1
Delaware	‡	11	288	73	‡	5	‡	9	‡	#	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

70. Which of the following are properties of every isosceles right triangle?

A. Three sides of equal length and three 90° angles
B. Three sides of equal length and exactly one 90° angle
C. Exactly two sides of equal length and three 90° angles
D. Exactly two sides of equal length and exactly one 90° angle
E. No sides of equal length and exactly one 90° angle

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Low
Description	Identify properties of an isosceles triangle			Content Area	Geometry

All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D*		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	258	9	265	11	262	9	298	47	285	23	272	2
Delaware	262	14	‡	11	‡	11	295	41	279	21	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

71. Fred and three of his friends have decided to rent an apartment. Their monthly expenses are shown in the table below.

MONTHLY EXPENSES	
Category	Amount per Month
Rent	$900
Utilities	$100 to $150
Food	$200 to $450

The four people will share all the expenses equally.

(a) Show how Fred would determine the greatest amount he would have to pay in any month.

(b) What is that greatest monthly amount?

Question Details					
Grade	8	Difficulty Level	Hard	Complexity	Moderate
Description	Solve multi-step story problem involving expenses			Content Area	Number Properties and Operations

All Students – Performance Data										
	Incorrect		Partial		Correct		Omitted		Off task	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	273	61	307	33	‡	#	259	6	263	#
Delaware	271	65	319	27	‡	#	‡	7	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.
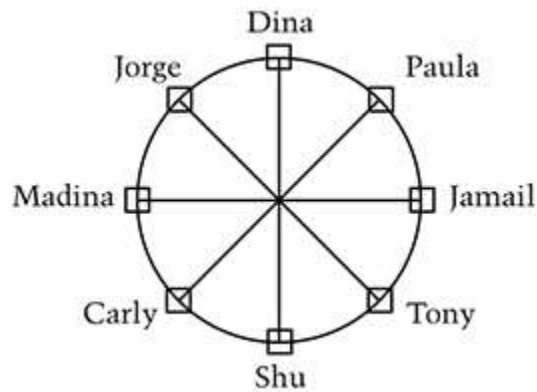
72. The figure above shows a Ferris wheel stopped with Dina at the top. Who will be at the top after a 135° clockwise rotation?

A. Tony
B. Carly
C. Madina
D. Jorge
E. Paula

All Students – Performance Data											* Denotes the correct answer	
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	281	27	298	44	270	13	264	8	264	7	277	1
Delaware	279	31	290	40	‡	11	‡	9	‡	7	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

The table below lists the coordinates of several points on a line.

x	y
1	3
2	5
3	7
4	9

73. Which of the following is an equation of the line?

A. $y = x + 2$
B. $y = 3x$
C. $y = 2x + 1$
D. $y = 4x - 1$
E. $y = 3x - 1$

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Find the equation of a line from the table of values			Content Area	Algebra

All Students – Performance Data											* Denotes the correct answer	
	A		B		C*		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	267	16	256	7	296	67	252	5	257	4	273	1
Delaware	264	25	‡	8	294	57	‡	4	‡	5	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

74. Richard wants to estimate the average (mean) monthly temperature of the United States last year. He will choose one of the following two methods to do this.

Method I:	Richard selects his state and 9 other states that are near his state. Then he finds the average (mean) monthly temperature of each of those 10 states and uses those numbers to compute the average monthly temperature of the United States.
Method II:	Richard selects 10 different states by writing the names of all 50 states on cards, with one state's name on each card. Then he places all of the cards in a hat and takes out 10 cards without looking. Finally, he finds the average (mean) monthly temperature of each of those 10 states and uses those numbers to compute the average monthly temperature of the United States.

Which method is better, I or II?

Explain why.

Question Details

Grade	8	Difficulty Level	Hard	Complexity	Moderate
Description	Identify best method for selecting a sample			Content Area	Data Analysis and Prob.

All Students – Performance Data

|	Incorrect		Correct		Omitted		Off task	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	272	56	309	37	263	7	250	#
Delaware	264	50	303	41	‡	9	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.
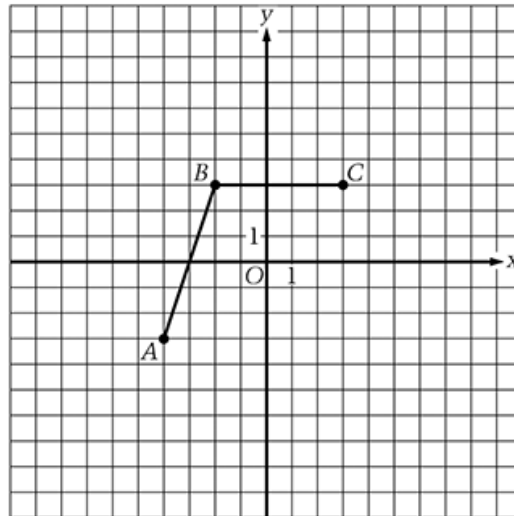
75. Which of the following coordinates of a point *D* would form a trapezoid *ABCD* in the figure above?

A. (-3, 1)
B. (-3, 5)
C. (0, -2)
D. (5, -6)
E. (8, -3)

Question Details					
Grade	8	Difficulty Level	Hard	Complexity	Low
Description	Determine coordinates to complete a trapezoid			Content Area	Geometry

All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D		E*		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	269	9	272	25	275	9	279	19	305	35	282	2
Delaware	‡	10	275	35	‡	11	276	18	303	24	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

76. In the past year and a half, Alfred's dog gained an average of $\frac{1}{4}$ pound each month. Today, Alfred's dog weighs 75.5 pounds. How much did the dog weigh a year and a half ago?

A. 57.5 pounds
B. 71.0 pounds
C. 71.5 pounds
D. 74.0 pounds
E. 79.5 pounds

Question Details

Grade	8	Difficulty Level	Median	Complexity	Moderate
Description	Solve a multi-step problem involving fractions			Content Area	Number Properties and Operations

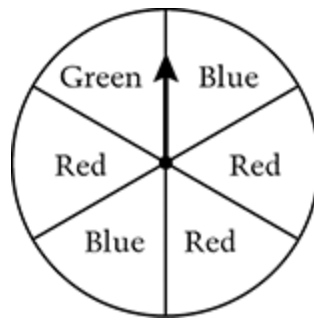| All Students – Performance Data											* Denotes the correct answer	
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	270	26	303	41	280	20	269	9	254	3	284	2
Delaware	268	31	299	38	280	16	‡	9	‡	4	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

77. The graph below shows the percentages of all households in the United States in the years 1940 to 1997 that owned at least one television set.

HOUSEHOLDS WITH TELEVISION SETS
IN THE UNITED STATES
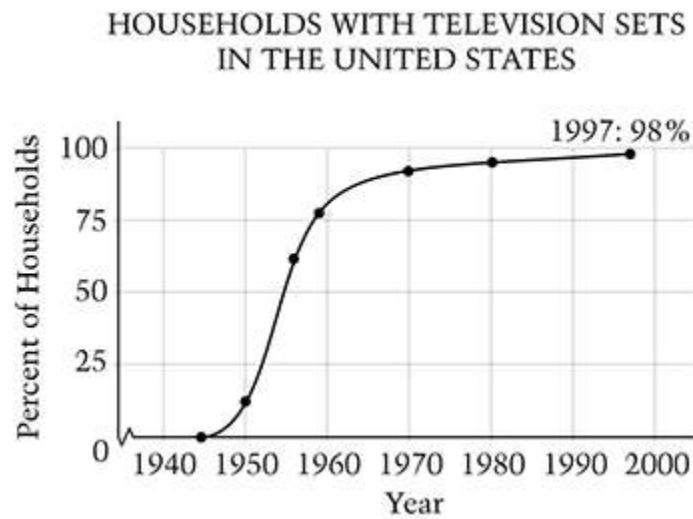
(a) In which year do you think that television sets were most likely first available for purchase in stores?

(b) In which year did 50 percent of the households own at least one television set?

(c) Write a sentence or two that compares the growth in the percentage of households with television sets across the three decades of the 1950's, 1960's, and 1970's.

(d) The points (1950, 10) and (1970, 90) both lie on the graph above. Both points are also solutions of the equation $y = 4x - 7790$. However, if the graph of $y = 4x - 7790$ were drawn for the years 1940 to 1997, it would <u>not</u> look like the graph shown. Explain why not.

Question Details					
Grade	8	Difficulty Level	Hard	Complexity	High
Description	Answer questions based on a graph			Content Area	Algebra

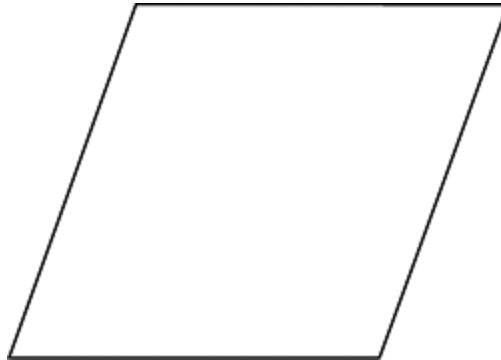| All Students – Performance Data												
	Incorrect		Minimal		Partial		Satisfactory		Extended		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	256	22	285	34	300	28	321	8	343	1	269	6
Delaware	257	23	279	31	295	30	‡	6	‡	1	‡	9

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.
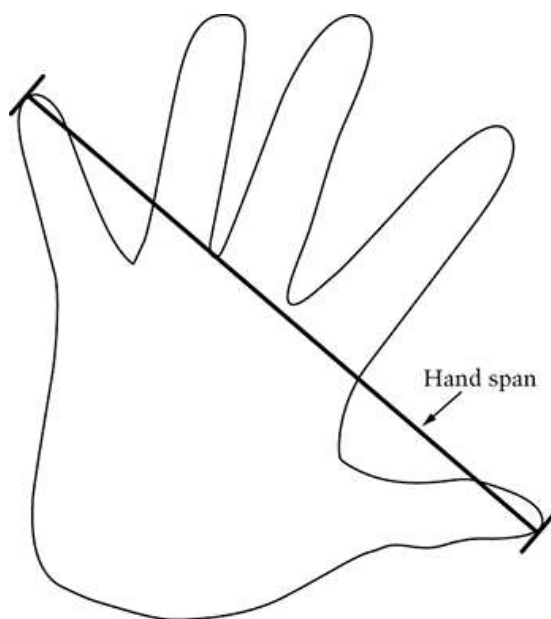
Hand span

78. As part of a science experiment, Vince is measuring the lengths of the hand spans of different people. Which of the following units would be most appropriate?

A. Centimeters
B. Cubic meters
C. Kilograms
D. Liters
E. Square centimeters

79. Sally can buy 20 pencils for $0.99. What is the greatest number of pencils Sally can buy for $3.00?

A. 30
B. 45
C. 60
D. 75
E. 90

80. The spinner below is divided into 6 congruent sectors.

If the arrow is spun once, what is the probability that the arrow will land on either Red or Blue?

A. $\frac{5}{6}$

B. $\frac{2}{3}$

C. $\frac{1}{2}$

D. $\frac{1}{5}$

E. $\frac{1}{6}$

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Find probability of an event			Content Area	Data Analysis and Prob.

All Students – Performance Data											* Denotes the correct answer	
	A*		B		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	290	67	261	15	249	4	252	3	262	11	262	1
Delaware	288	63	258	18	‡	4	‡	3	265	12	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

81. Draw two lines of symmetry for the rhombus below.

82. Stacie rides her bike 3 miles in 12 minutes. At this rate, how long will it take her to ride her bike 7 miles?

A. 22 minutes
B. 28 minutes
C. 36 minutes
D. 43 minutes
E. 84 minutes

Question Details					
Grade	8	Difficulty Level	Easy	Complexity	Low
Description	Solve a problem involving rates			Content Area	Measurement

All Students – Performance Data											* Denotes the correct answer
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	231	6	292	74	243	6	245	2	251	11	254	#
Delaware	‡	6	289	74	‡	7	‡	2	246	10	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

83. The expression *80n* could represent

A. an increase of 80 cents in the cost of a candy bar that originally cost *n* cents
B. a decrease of 80 cents in the cost of a candy bar that originally cost *n* cents
C. the cost of each candy bar in a pack of *n* candy bars where the total cost of the pack is 80 cents
D. the cost of each candy bar in a pack of 80 candy bars where the total cost of the pack is *n* cents
E. the total cost, in cents, of *n* candy bars at a cost of 80 cents for each candy bar

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Low
Description	Choose statement corresponding to expression			Content Area	Algebra

All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D		E*		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	263	12	240	3	269	22	270	18	297	44	265	1
Delaware	269	14	‡	3	265	21	263	15	293	45	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

84. Which of the following geometric solids has both of the properties listed?

    1. The base is a polygon with 4 sides of equal length.

    2. The other faces of the solid meet at a common vertex.

A. Cone
B. Cube
C. Rectangular prism
D. Right cylinder
E. Square pyramid

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Moderate
Description	Identify solid based on description			Content Area	Geometry

All Students – Performance Data										* Denotes the correct answer	
	A		B		C		D		E*		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	258	3	270	32	260	14	248	3	295	48	269	1
Delaware	‡	2	267	30	266	16	‡	3	290	46	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

Helga's process of calculating the tip to leave in a restaurant starts with the bill for food and drink.

- First, she rounds the bill to the nearest ten cents.

- Then she moves the decimal point in the rounded total one place to the left.

- Finally, she doubles that amount.

85. Helga's process calculates approximately what percent of the original bill?

A. 2%
B. 5%
C. 10%
D. 15%
E. 20%

Question Details					
Grade	8	Difficulty Level	Hard	Complexity	Moderate
Description	Determine percent tip on a bill			Content Area	Number Properties and Operations

All Students – Performance Data											* Denotes the correct answer	
	A		B		C		D		E*		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	279	11	276	16	272	31	267	13	298	27	273	2
Delaware	278	12	276	15	263	33	267	12	298	26	‡	2

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

86. Tyler drinks 24 fluid ounces of milk each day for 7 days. How many quarts of milk does he drink in the 7 days? Do not round your answer. (1 quart = 32 fluid ounces)

Answer: _____ quarts

Show how you found your answer.

87. What are all values of n for which $-2n \geq n + 6$?

A. $n \leq -2$

B. $n \geq -2$

C. $n \geq 0$

D. $n \leq 6$

E. $n \geq 6$

88. Which of the following statements is true about line ℓ shown above?

A. Line ℓ has a positive slope and a positive y-intercept.
B. Line ℓ has a positive slope and a negative y-intercept.
C. Line ℓ has zero slope and a negative y-intercept.
D. Line ℓ has a negative slope and a positive y-intercept.
E. Line ℓ has a negative slope and a negative y-intercept.

Question Details					
Grade	8	Difficulty Level	Medium	Complexity	Low
Description	Identify properties of a line			Content Area	Algebra

All Students – Performance Data											* Denotes the correct answer	
	A		B*		C		D		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	267	20	294	54	250	5	257	11	270	8	266	1
Delaware	260	17	291	57	‡	5	257	12	‡	8	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.

89. Old Faithful is one of hundreds of geysers in Yellowstone National Park. Predicting when Old Faithful will erupt next can be done by timing the previous eruption.

If an eruption lasts t minutes, then the next eruption will occur approximately $12.5t + 33$ minutes after the eruption ends. If the previous eruption lasted 6 minutes and ended at 1:23 P.M. , when is the next eruption expected to occur?

Answer: _____

Show how you found your answer.

90. The ratio of boys to girls to adults at a school party was 6:5:2. There were 78 people at the party. How many of them were adults?

A. 6
B. 12
C. 18
D. 30
E. 36

91. Liz is conducting an experiment to see whether students learn vocabulary words by a new method faster than they learn them by the old method. Fifty students will participate in the experiment. She pairs off the 50 students so that the two students in each pair have similar levels of vocabulary. One student in each pair then learns words by the old method. The other student in the pair learns words by the new method. Why did Liz pair off her 50 students instead of just having all 50 of them use the new method?

All Students – Performance Data

	Incorrect		Correct		Omitted		Off task	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	279	82	305	12	253	6	245	1
Delaware	277	80	303	12	‡	7	‡	1

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

92. Mary draws a circle and a square on a piece of paper. What is the greatest possible number of points of intersection between the circle and square?

A. 2
B. 4
C. 6
D. 8
E. 10

All Students – Performance Data												* Denotes the correct answer
	A		B		C		D*		E		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	271	14	281	54	265	10	298	19	258	3	278	#
Delaware	265	12	283	52	259	14	294	18	‡	4	‡	#

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

93. (a) If c and d are different prime numbers less than 10 and the sum $c + d$ is a <u>composite</u> number greater than 10, what is one possible pair of values for c and d ?

$c =$ _____ $d =$ _____

(b) If j and k are different prime numbers less than 10 and the sum $j + k$ is a <u>prime</u> number less than 10, what is one possible pair of values for j and k ?

$j =$ _____ $k =$ _____

(c) If s and t are different prime numbers greater than 10, explain why the sum $s + t$ cannot be a prime number.

Question Details					
Grade	8	Difficulty Level	Hard	Complexity	High
Description	Solve problem involving prime numbers			Content Area	Number Properties and Operations

All Students – Performance Data												
	Incorrect		Minimal		Partial		Satisfactory		Extended		Omitted	
	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.	Avg. score	Row Pct.
National Public	264	52	293	20	313	12	333	4	350	2	265	9
Delaware	269	59	294	15	‡	6	‡	3	‡	2	267	14

‡ Reporting standards not met.

† Not applicable.

NOTE: The NAEP Mathematics scale ranges from 0 to 500. Some apparent differences between estimates may not be statistically significant.

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2013 Mathematics Assessment.