NAEP Released Items Aligned to the Iowa Core

4.OA.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

4.OA.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

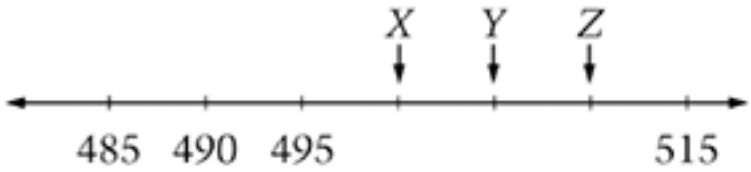
Carla has 12 boxes that each weighs the same amount. What would be a quick way for her to find the total weight of the 12 boxes?

A. Add 12 to the weight of one of the boxes.
B. Subtract 12 from the weight of one of the boxes.
C. Divide the weight of one of the boxes by 12.
D. Multiply the weight of one of the boxes by 12.

2003-4-6-9
2003-8-6-9

Source: National Assessment of Educational Progress, 2003, Grade 4 and Grade 8 Mathematics Assessments.

4.OA.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.



On the number line above, what is the sum of the numbers to which the arrows X, Y, and Z point?

E. 1,491
F. 1,515
G. 1,530
H. 1,545

2011-4-8-8

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

Raynold had 31 baseball cards. He gave the cards to his friends. Six of his friends received 3 cards each. Seven of his friends received 1 card each. The rest received 2 cards each. How many of his friends received exactly 2 cards from Raynold?

Explain how you found your answer.

2005-8-12-18

Source: National Assessment of Educational Progress, 2005, Grade 4 and Grade 8 Mathematics Assessments.

An amusement park has games, rides, and shows.

- The total number of games, rides, and shows is 70.
- There are 34 rides.
- There are two times as many games as shows.

How many games are there? _____

How many shows are there? _____

Use numbers, words, or drawings to show how you got your answer.

2011-4-8-19

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

A student had to multiply 328 X 41. The student's answer was 4,598.

Use estimation to explain why this answer is not reasonable.

2011-4-12-11

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

Ms. Kim has 45 stickers that she wants to give out to 6 students. The students are sitting in a circle. Ms. Kim gives out one sticker at a time and keeps going around the circle until all the stickers are gone. How many of the students will get more than 7 stickers?

A. 2
B. 3
C. 5
D. 6

2011-4-12-13

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

Five classes are going on a bus trip and each class has 21 students. If each bus holds only 40 students, how many buses are needed for the trip?

2007-4-9-16

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

Stickers come in small booklets of 100 and in rolls of 1,000. On the store shelf, there are 6 booklets and 4 rolls of stickers. How many stickers are on the shelf?

A. 1,100
B. 4,600
C. 6,400
D. 10,000

2007-4-11-15

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

In Jean's class there are twice as many boys as girls. If there are 10 girls in the class, how many boys and girls are there in the class?

A. 15
B. 20
C. 25
D. 30

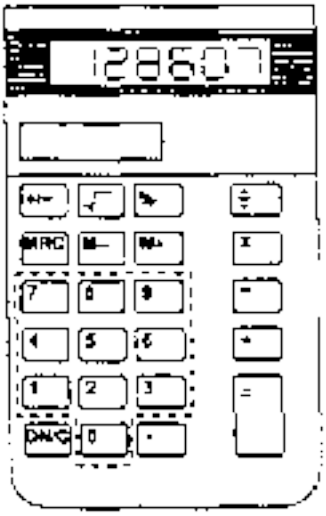
2003-4-7-16

Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.

Ms. Hernandez formed teams of 8 students each from the 34 students in her class. She formed as many teams as possible, and the students left over were substitutes. How many students were substitutes?

1996-4-9-7

Source: National Assessment of Educational Progress, 1996, Grade 4 Mathematics Assessment.



Mark tried to add the numbers 489 and 263 on his calculator. What is the sum of these numbers?

The display on Mark's calculator showed his answer to be 128607. Mark had pressed a wrong key when trying to add. Which wrong key did he press?

1996-4-12-5

Source: National Assessment of Educational Progress, 1996, Grade 4 Mathematics Assessment.

Mario sells 80 pencils a day from his supply of 1,000 pencils. Which of the following is true?

A. He will run out of pencils in 7 days.
B. He will have enough pencils to sell 80 each day for at least 10 days.
C. He will have enough pencils to sell 80 each day for at least 80 days.
D. He will have enough pencils to sell 80 each day for at least 100 days.

1992-4-14-6

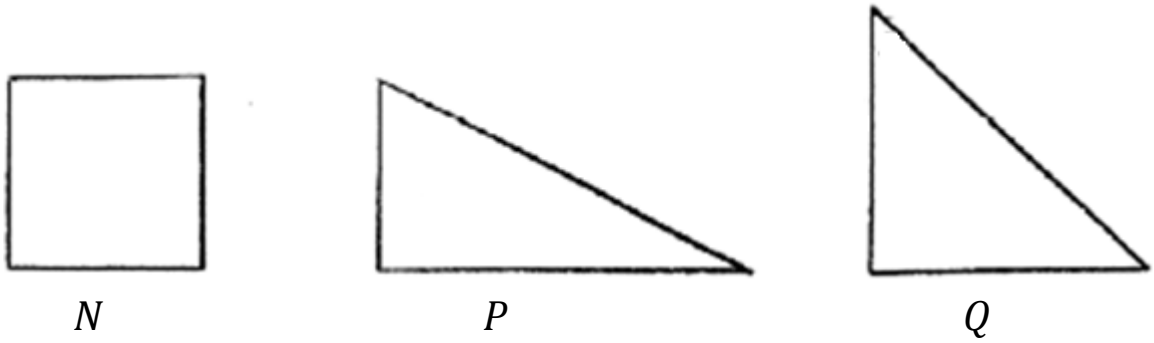
Source: National Assessment of Educational Progress, 1992, Grade 4 Mathematics Assessment.

If the sum of 39 and 66 is divided by 3, the result is

A. 35
B. 61
C. 79
D. 315

1990-4-9-6

Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.



This question refers to shapes *N, P,* and *Q*.
In Mr. Bell's classes, the students voted for their favorite shape for a symbol. Here are the results.

	Class 1	Class 2	Class 3
Shape *N*	9	14	11
Shape *P*	1	9	17
Shape *Q*	22	7	2

Using the information in the chart, Mr. Bell must select one of the shapes to be the symbol. Which one should he select and why?

The shape Mr. Bell should select: _____

Explain:

1996-4-10-5
1996-8-10-7
1996-12-10-5

Source: National Assessment of Educational Progress, 1996, Grade 4 and 8 Mathematics Assessment.

Fifteen boxes each containing 8 radios can be repacked in 10 larger boxes each containing how many radios?

A. 8
B. 10
C. 12
D. 80
E. 120

2003-8-7-9

Source: National Assessment of Educational Progress, 2003, Grade 8 Mathematics Assessment.

A high school orders 11 buses to transport 418 students. If each bus can seat 35 students, will the number of buses ordered be enough to provide a seat for each student?

( ) Yes ( ) No

Explain your answer.

2003-8-10-5

Source: National Assessment of Educational Progress, 2003, Grade 8 Mathematics Assessment.

Anita is making bags of treats for her sister's birthday party. She divides 65 pieces of candy equally among 15 bags so that each bag contains as many pieces as possible. How many pieces will she have left?

A. 33
B. 5
C. 4
D. 3
E. 0.33

1996-8-12-1

Source: National Assessment of Educational Progress, 1996, Grade 8 Mathematics Assessment.

There are 50 hamburgers to serve 38 children. If each child is to have at least one hamburger, at most how many of the children can have more than one?

A. 6
B. 12
C. 26
D. 38

1992-4-5-5
1992-8-5-5

Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.

Christy has 88 photographs to put in her album. If 9 photographs will fit on each page, how many pages will she need?

A. 8
B. 9
C. 10
D. 11

1992-4-5-13
1992-8-5-13

Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.

Jill needs to earn $45.00 for a class trip. She earns $2.00 each day on Mondays, Tuesdays, and Wednesdays, and $3.00 each day on Thursdays, Fridays, and Saturdays. She does not work on Sundays. How many weeks will it take her to earn $45.00?

1992-4-7-7
1992-8-7-7

Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.

Raymond must buy enough paper to print 28 copies of a report that contains 64 sheets of paper. Paper is only available in packages of 500 sheets. How many whole packages of paper will he need to buy to do the printing?

1992-8-14-6
1992-12-14-6

Source: National Assessment of Educational Progress, 1992, Grade 8 and Grade 12 Mathematics Assessments.

There are 20 boxes of pencils in a case. Each box has the same number of pencils. The case has 420 pencils altogether. How many pencils are in each box?

2008-17-21-6

Source: National Assessment of Educational Progress, 2008, Age 17 Mathematics Assessment.

4.OA.4 Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Which factor of 12 is missing in this list of numbers?

1, 2, 3, 4, ___, 12

A. 5
B. 6
C. 8
D. 10

2011-4-12-10

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

On the chart, circle all the numbers that have 4 as a factor.

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15

2007-4-7-9

Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

Which of these numbers is a prime number?

A. 6
B. 27
C. 67
D. 81

2008-9-21-3

Source: National Assessment of Educational Progress, 2008, Age 9 Mathematics Assessment.

Which of the following true statements proves that 119 is not a prime number?

A. 17 x 7 = 119
B. 119 x 1 =119
C. 119 is greater than 100.
D. 119 is an odd number.
E. 119 is not divisible by 3

2011-8-12-3

Source: National Assessment of Educational Progress, 2011, Grade 8 Mathematics Assessment.

A certain even number is divisible by 9. This number is between 100 and 120. What is the number?

2009-8-10-13

Source: National Assessment of Educational Progress, 2009, Grade 8 Mathematics Assessment.

Which of the following is both a multiple of 3 and a multiple of 7?

A. 7,007
B. 8,192
C. 21,567
D. 22,287
E. 40,040

1992-8-14-1
1992-12-14-1

Source: National Assessment of Educational Progress, 1992, Grade 8 and Grade 12 Mathematics Assessments.

If 12 divides a whole number *n* without a remainder, list all whole numbers greater than 1 and less than 12 that must also divide *n* without a remainder.

1990-8-9-12

Source: National Assessment of Educational Progress, 1990, Grade 8 Mathematics Assessment.

The numbers 20 and 22 have a common factor. What is the common factor?

A. 2
B. 4
C. 20
D. 22
E. 440

2008-13-21-2

Source: National Assessment of Educational Progress, 2008, Age 13 Mathematics Assessment.

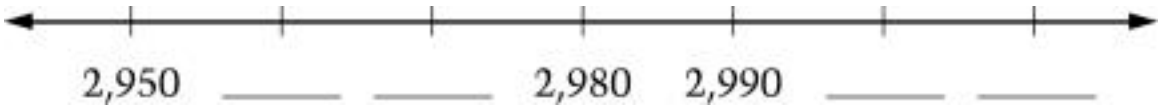
Which of these numbers is a prime number?

A. 15
B. 23
C. 34
D. 56

2008-17-21-1

Source: National Assessment of Educational Progress, 2008, Age 17 Mathematics Assessment.

4.OA.5 Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.



Fill in the four missing numbers on the number line above.

2005-4-12-18

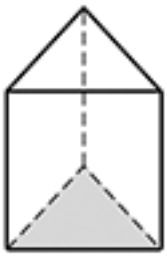
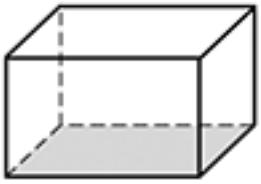
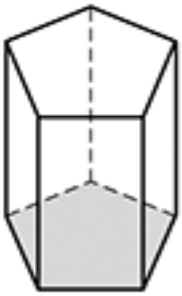
Source: National Assessment of Educational Progress, 2005, Grade 4 Mathematics Assessment.

Two whole numbers, each greater than 2, are multiplied together. The product is 126. What could the two numbers be?

_____ and _____

2003-4-7-18

Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.

Shape	Number of Edges
Triangular Prism 	9
Rectangular Prism 	12
Pentagonal Prism 	15

The table shows the number of edges for each prism. What is the number of edges for a prism if the bottom face has 7 sides?

A. 18
B. 20
C. 21
D. 22

2011-4-12-14

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

Every 30 minutes Dr. Kim recorded the number of bacteria in a test tube.

Time	Number of Bacteria
1:00 P.M.	600
1:30 P.M.	1,190
2:00 P.M.	2,390
2:30 P.M.	4,800

Which best describes what happened to the number of bacteria every 30 minutes?

A. The number of bacteria increased by 500.
B. The number of bacteria increased by 1,000.
C. The number of bacteria doubled.
D. The number of bacteria tripled.

2011-4-8-14

Source: National Assessment of Educational Progress, 2011, Grade 4 Mathematics Assessment.

Write the next two numbers in the number pattern.

1 6 4 9 7 12 10 ____ ____

Write the rule that you used to find the two numbers you wrote.

2009-4-5-12
2009-8-5-11

Source: National Assessment of Educational Progress, 2009, Grade 4 and Grade 8 Mathematics Assessment.

Kiara set her beads on a table to make a repeating pattern. Some of the beads rolled off the table. Here is what was left.

Which of the following should Kiara use to replace the missing beads in the pattern?

A.

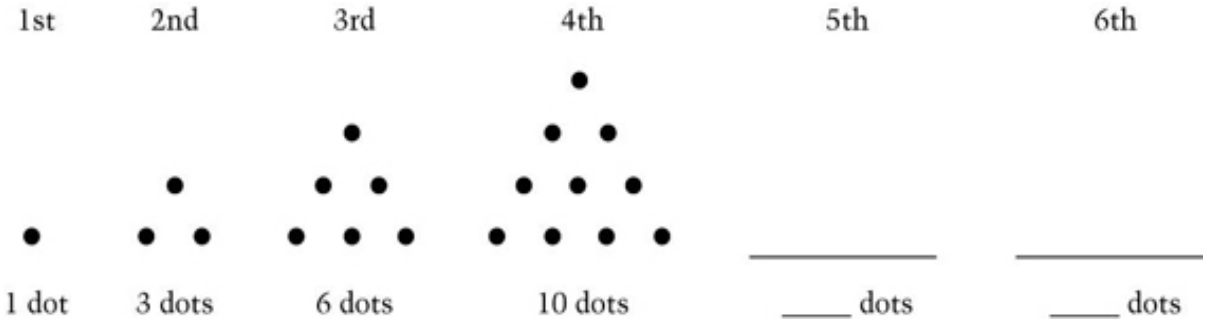
B.

C.

D.

2009-4-10-8

Source: National Assessment of Educational Progress, 2009, Grade 4 Mathematics Assessment.



A pattern of dots is shown above. How many dots would be in the 6th picture?

Explain how you found your answer.

2009-4-10-13

Source: National Assessment of Educational Progress, 2009, Grade 4 Mathematics Assessment.

In	Out
2	5
3	7
4	9
5	11
15	31
38	

The table shows how the "In" numbers are related to the "Out" numbers. When 38 goes in, what number comes out?

A. 41
B. 51
C. 54
D. 77

2007-4-7-12

Source: National Assessment of Educational Progress, 2009, Grade 4 Mathematics Assessment.

In the pattern shown above, which of the following would go into the blank space?

A.

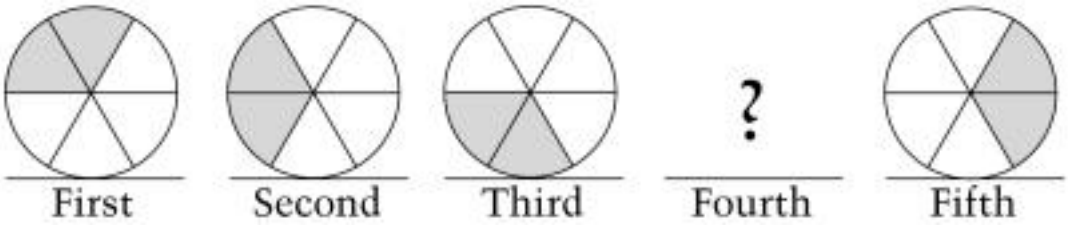
B.

C.

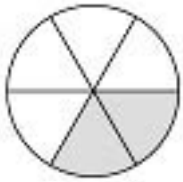
D.

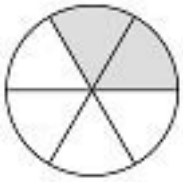
2007-4-9-17

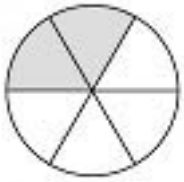
Source: National Assessment of Educational Progress, 2007, Grade 4 Mathematics Assessment.

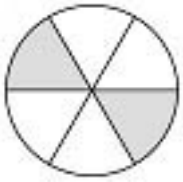


Which of the figures below should be the fourth figure in the pattern shown above?

A. 

B. 

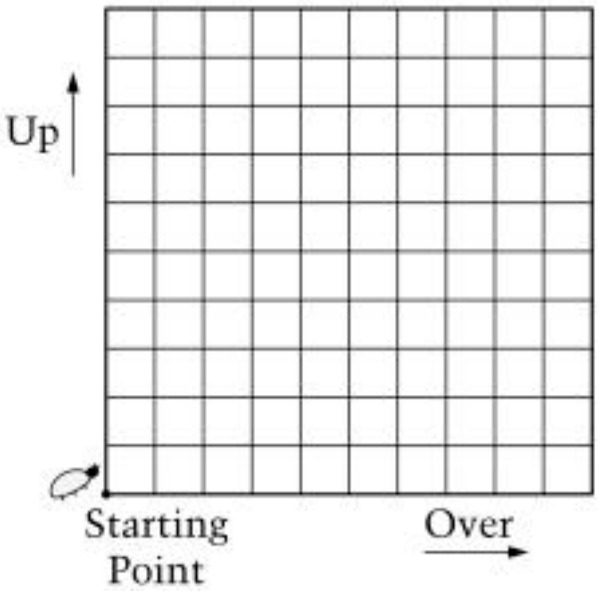
C. 

D. 

2005-4-4-3

Source: National Assessment of Educational Progress, 2005, Grade 4 Mathematics Assessment.

From the starting point on the grid below, a beetle moved in the following way. It moved 1 block up and then 2 blocks over, and then continued to repeat this pattern. Draw lines to show the path the beetle took to reach the right side of the grid.



2005-4-4-10

Source: National Assessment of Educational Progress, 2005, Grade 4 Mathematics Assessment.

3, 6, 5, 8, 7, 10, 9, ___

In the number pattern above, what number comes next?

2005-4-12-6

Source: National Assessment of Educational Progress, 2005, Grade 4 Mathematics Assessment.

□	△
4	9
5	11
6	13
7	15

Which rule describes the pattern shown in the table?

A. □ + 5 = △

B. □ + □ = △

C. □ + □ + 1 = △

D. □ + □ + 2 = △

2005-4-12-14

Source: National Assessment of Educational Progress, 2005, Grade 4 Mathematics Assessment.

Peter wrote down a pattern of A's and B's that repeats in groups of 3. Here is the beginning of his pattern with some of the letters erased. Fill in the missing letters.

A B _ A _ B _ _ _

2003-4-6-8

Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.

The table below shows how the chirping of a cricket is related to the temperature outside. For example, a cricket chirps 144 times each minute when the temperature is 76°.

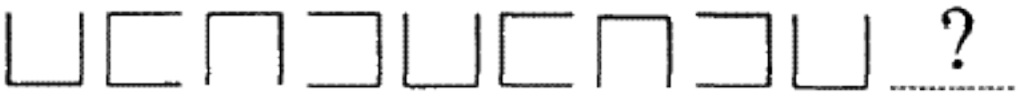
Number Of Chirps Per Minute	Temperature
144	76°
152	78°
160	80°
168	82°
176	84°

What would be the number of chirps per minute when the temperature outside is 90° if this pattern stays the same?

Explain how you figured out your answer.

2003-4-7-20

Source: National Assessment of Educational Progress, 2003, Grade 4 Mathematics Assessment.



In the pattern above, which figure would be next?

A.

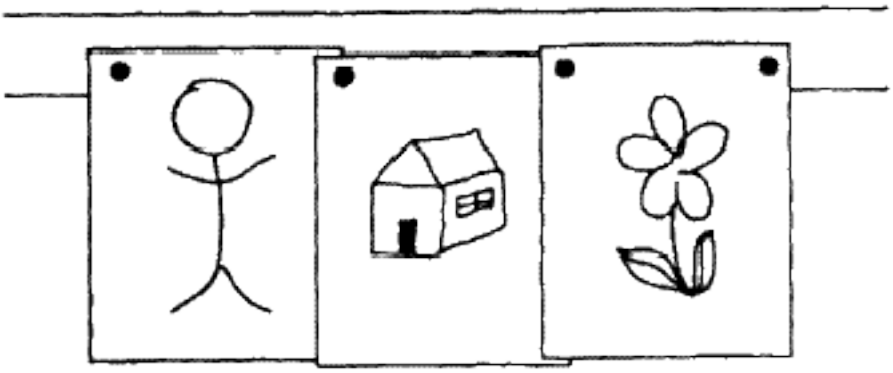
B.

C.

D.

1992-4-5-3
1992-8-5-3

Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.



Children's pictures are to be hung in a line as shown in the figure above. Pictures that are hung next to each other share a tack. How many tacks are needed to hang 28 pictures in this way?

A. 27
B. 28
C. 29
D. 56

1992-4-7-8
1992-8-7-8

Source: National Assessment of Educational Progress, 1992, Grade 4 and Grade 8 Mathematics Assessments.

In 1990 a school had 125 students. Each year the number of students in the school increases by 50. Fill in the table to show the number of students expected for each year.

Year	Number of Students
1990	125
1991	_____
1992	_____
1993	_____

1992-4-14-3

Source: National Assessment of Educational Progress, 1992, Grade 4 Mathematics Assessment.

Column *A*	Column *B*
12 →	3
16 →	4
24 →	6
40 →	10

What is a rule used in the table to get the numbers in column *B* from the numbers in column *A*?

A. Divide the number in column *A* by 4.
B. Multiply the number in column *A* by 4.
C. Subtract 9 from the number in column *A*.
D. Add 9 to the number in column *A*.

Suppose 120 is a number in column *A* of the table. Use the same rule to fill in the number in column *B*.

Column *A*	Column *B*
120 →	

1992-4-14-7/8

Source: National Assessment of Educational Progress, 1992, Grade 4 Mathematics Assessment.

A pattern of shapes is to be repeated many times. The figure above shows one completed pattern and the beginning of the next. What shape comes next?

A.

B.

C.

D.

1990-4-9-3

Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.

The table below shows some number pairs. The following rule was used to find each number in column B.

Rule: Multiply the number in column A by itself and then add 3.
Fill in the missing number, using the same rule.

	A	B
Example:	2	7 = (2 x 2) + 3
	3	12
	5	28
	8	____

1990-4-9-12

Source: National Assessment of Educational Progress, 1990, Grade 4 Mathematics Assessment.

If each of the counting numbers from 1 through 10 is multiplied by 13, how many of the resulting numbers will be even?

A. One
B. Four
C. Five
D. Six
E. Ten

1996-8-12-4

Source: National Assessment of Educational Progress, 1996, Grade 8 Mathematics Assessment.

What can be said about the sum of three odd numbers?

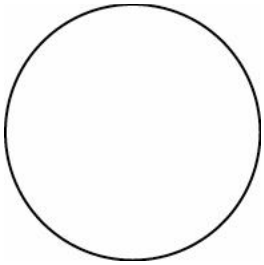
A. It is always an odd number.
B. It is always an even number.
C. It is always a prime number.
D. It is sometimes an even number and sometimes an odd number.

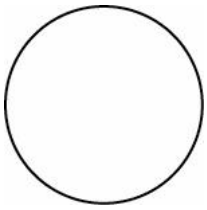
2008-13-21-23

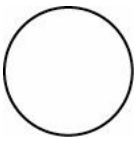
Source: National Assessment of Educational Progress, 2008, Age 13 Mathematics Assessment.

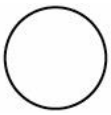
Circle *W* has a larger circumference (distance around) than circle *X*.
Circle *Y* has a larger circumference than circle *W*.
Circle *Z* has a smaller circumference than circle *X*.

Each choice below represents one of the four circles. Which figure is circle *Y*? Each choice below represents one of the four circles. Which figure is circle *Y*?

A. 

B. 

C. 

D. 

2008-9-21-10
2008-13-21-10

Source: National Assessment of Educational Progress, 2008, Age 9 and Age 13 Mathematics Assessments.

If each of the counting numbers from 1 through 10 is multiplied by 13, how many of the resulting numbers will be even?

A. One
B. Four
C. Five
D. Six
E. Ten

1996-12-12-4

Source: National Assessment of Educational Progress, 1996, Grade 12 Mathematics Assessment.