TIMSS USA 4

MATHEMATICS ITEMS

Guide to the Content and Layout of This Book

The *Mathematics Items* book contains, in a ready-to-use form, the released TIMSS 1995 and TIMSS 2003 mathematics assessment items that appeared in Book 3, *Mathematics Concepts and Mathematics Items*. Each item is presented on a separate page to facilitate printing.

The two books are designed to be used in tandem. The *Mathematics Items* book is designed to facilitate the construction of sets of items tailored to the purpose of the user—most likely a classroom teacher. Users can select items for their own purpose based on their reading of the *Mathematics Concepts and Mathematics Items* book, print these, and administer them to students. Student responses can be scored using the scoring instructions presented in the *Mathematics Concepts and Mathematics Items* book and may be compared to the international benchmarks presented there.

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When you subtract one of the numbers below from 900, the answer is greater than 300. Which number is it?

A. 823

B. 712

C. 667

D. 579

Item Number: I3

What is 3 times 23?

A. 323

B. 233

C. 69

D. 26

Item Number: I4

Subtract: 6,000
–2,369

A. 4,369

B. 3,742

C. 3,631

D. 3,531

Item Number: I9

25×18 is more than 24×18. How much more?

A. 1

B. 18

C. 24

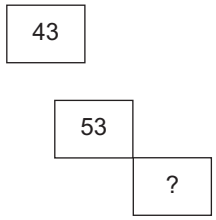
D. 25

Item Number: J4

Here is part of a wall chart that lists numbers from 1 to 100.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25					

Below is part of the same wall chart. What number should be in the box with the question mark inside?



A. 34

B. 44

C. 54

D. 64

Item Number: J9

Add: 6,971
+5,291

A. 11,162

B. 12,162

C. 12,262

D. 1,211,162

Item Number: K2

In which pair of numbers is the second number 100 more than the first number?

A. 199 and 209

B. 4,236 and 4,246

C. 9,635 and 9,735

D. 51,863 and 52,863

Item Number: L7

☐ stands for a number. 7 × ☐ will always give the same answer as

A. ☐ × 7

B. ☐ + 7

C. ☐ – 7

D. 7 + ☐

E. ☐ ÷ 7

Item Number: M3

John wanted to use his calculator to add 1,463 and 319. He entered 1,263 + 319 by mistake. What could he do to correct his mistake?

A. Add 200.

B. Add 2.

C. Subtract 2.

D. Subtract 200.

Item Number: M6

Which of these is the largest number?

A. 2,735

B. 2,537

C. 2,573

D. 2,753

Item Number: M8

Here is a number sentence.

2,000 + + 30 + 9 = 2,739

What number goes where the is to make this sentence true?

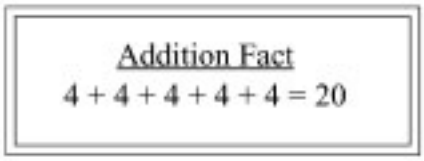
Answer: _____

Item Number: S2

What is the smallest whole number that you can make using the digits 4, 3, 9 and 1? Use each digit only once.

Answer: _____

Item Number: T2



Write this addition fact as a multiplication fact.

_____ × _____ = _____

Item Number: U5

Write the number that is 1,000 more than 56,821.

Answer: _____

Item Number: V2

What is 5 less than 203?

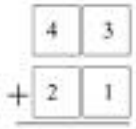
Answer: _____

Item Number: V3

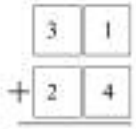
In a game, Mysong and Naoki are making problems. They each have four cards like these.

The winner of the game is the person who can make the problem with the largest answer.

Mysong placed the cards like this.



Naoki placed the cards like this.

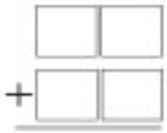


Who won this game? _____

How do you know? _____

_____

Write numbers in the squares below to show how you would place the cards to beat both Mysong and Naoki.

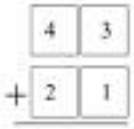


Item Number: V4A

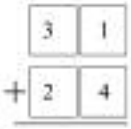
In a game, Mysong and Naoki are making problems. They each have four cards like these.

The winner of the game is the person who can make the problem with the largest answer.

Mysong placed the cards like this.



Naoki placed the cards like this.



Who won this game? _____

How do you know? _____

_____

Write numbers in the squares below to show how you would place the cards to beat both Mysong and Naoki.

Item Number: V4B

0.4 is the same as

A. four

B. four tenths

C. four hundredths

D. one-fourth

Item Number: I2

Mario uses 5 tomatoes to make half a liter of tomato sauce. How much sauce can he make from 15 tomatoes?

A. A liter and a half

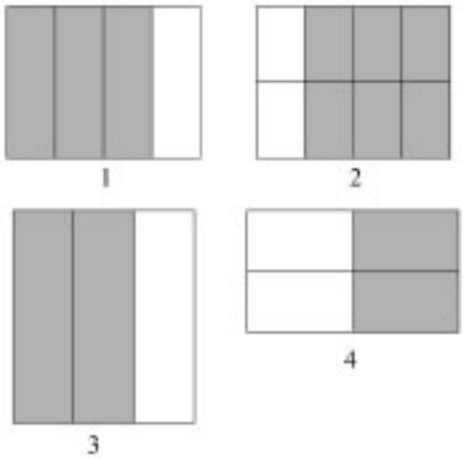
B. Two liters

C. Two liters and a half

D. Three liters

Item Number: I5

Each figure represents a fraction.



Which two figures represent the same fraction?

A. 1 and 2

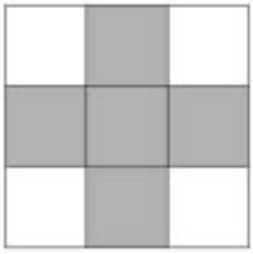
B. 1 and 4

C. 2 and 3

D. 3 and 4

Item Number: I8

Part of the figure is shaded.



What fraction of the figure is shaded?

A. $\frac{5}{4}$

B. $\frac{4}{5}$

C. $\frac{6}{9}$

D. $\frac{5}{9}$

Item Number: J7

There are 54 marbles, and they are put into 6 bags, so that the same number of marbles is in each bag. How many marbles would 2 bags contain?

A. 108 marbles

B. 18 marbles

C. 15 marbles

D. 12 marbles

E. 9 marbles

Item Number: K9

Which number represents the shaded part of the figure?

A. 2.8

B. 0.5

C. 0.2

D. 0.02

Item Number: M5

Julie put a box on a shelf that is 96.4 centimeters long. The box is 33.2 centimeters long. What is the longest box she could put on the rest of the shelf?
Show all your work.

Answer: _____

Item Number: S3

A teacher marks 10 of her pupils' tests every half hour. It takes her one and one-half hours to mark all her pupils' tests. How many pupils are in her class?

Answer: _____

Item Number: S4

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are there in Juanita's class?
Answer: _____

Is Juanita right? Answer: _____
Use words or pictures to explain why.

Is Amanda right? Answer: _____
Use words and pictures to explain why.

Item Number: T4A

There are 10 girls and 20 boys in Juanita's class. Juanita said that there is one girl for every two boys. Her friend Amanda said that means $\frac{1}{2}$ of all the students in the class are girls.

How many students are there in Juanita's class?
Answer: _____

Is Juanita right? Answer: _____
Use words or pictures to explain why.

Is Amanda right? Answer: _____
Use words and pictures to explain why.

Item Number: T4B

Write a fraction that is larger than $\frac{2}{7}$.

Answer: _____

Item Number: U2

Maria and her sister Louisa leave home at the same time and ride their bicycles to school 9 kilometers away.

Maria rides at a rate of 3 kilometers in 10 minutes. How long will it take her to get to school?

Answer: _____ minutes

Louisa rides at a rate of 1 kilometer in 3 minutes. How long will it take her to get to school?

Answer: _____ minutes

Who arrives at school first?

Answer: _____

Item Number: U3A

Maria and her sister Louisa leave home at the same time and ride their bicycles to school 9 kilometers away.

Maria rides at a rate of 3 kilometers in 10 minutes. How long will it take her to get to school?

Answer: _____ minutes

Louisa rides at a rate of 1 kilometer in 3 minutes. How long will it take her to get to school?

Answer: _____ minutes

Who arrives at school first?

Answer: _____

Item Number: U3B

Maria and her sister Louisa leave home at the same and ride their bicycles to school 9 kilometers away.

Maria rides at a rate of 3 kilometers in 10 minutes. How long will it take her to get to school?

Answer: _____ minutes

Louisa rides at a rate of 1 kilometer in 3 minutes. How long will it take her to get to school?

Answer: _____ minutes

Who arrives at school first?

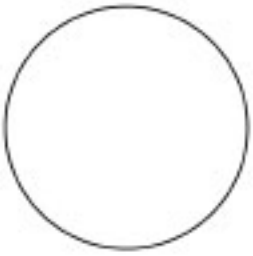
Answer: _____

Item Number: U3C

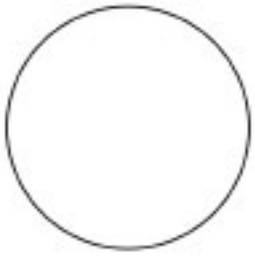
Sam said that $\frac{1}{3}$ of a pie is less than $\frac{1}{4}$ of the same pie.

Is Sam correct? _____

Use the circles below to show why this is so.



Shade in $\frac{1}{3}$ of this circle



Shade in $\frac{1}{4}$ of this circle

Item Number: V1

Which of these is largest?

A. 1 kilogram

B. 1 centigram

C. 1 milligram

D. 1 gram

Item Number: J6

Elena worked 57 hours in March, 62 hours in April, and 59 hours in May. Which of these is the BEST estimate of the total number of hours she worked for the three months?

A. 50 + 50 + 50

B. 55 + 55 + 55

C. 60 + 60 + 60

D. 65 + 65 + 65

Item Number: J8

About how long is this picture of a pencil?

A. 5 cm

B. 10 cm

C. 20 cm

D. 30 cm

Item Number: K5

A thin wire 20 centimeters long is formed into a rectangle. If the width of this rectangle is 4 centimeters, what is its length?

A. 5 centimeters

B. 6 centimeters

C. 12 centimeters

D. 16 centimeters

Item Number: K7

The weight (mass) of a clothespin is 9.2 g. Which of these is the best estimate of the total weight (mass) of 1,000 clothespins?

A. 900 g

B. 9,000 g

C. 90,000 g

D. 900,000 g

Item Number: L6

Four children measured the width of a room by counting how many paces it took them to cross it. The chart shows their measurements.

Name	Number of Paces
Stephen	10
Erlane	8
Ana	9
Carlos	7

Who had the longest pace?

A. Stephen

B. Erlane

C. Ana

D. Carlos

Item Number: L8

Which of these would most likely be measured in milliliters?

A. The amount of liquid in a teaspoon

B. The weight (mass) of a pin

C. The amount of gasoline in a tank

D. The thickness of 10 sheets of paper

Item Number: M7

Here is a paper clip.

About how many lengths of the paper clip is the same as the length of this line?

Answer: _____

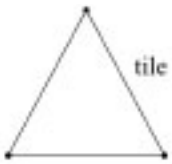
Item Number: S5

Mr. Brown goes for a walk and returns to where he started at 07:00. If his walk took 1 hour and 30 minutes, at what time did he start his walk?

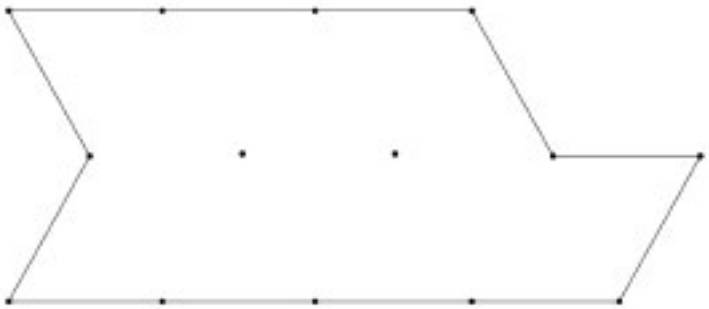
Answer:_____

Item Number: T3

The triangle represents one tile in the shape of a triangle.



How many tiles will it take to cover the figure below?



Number of tiles: _____

Use the figure above to show how you worked out your answer.

Item Number: U1

How many millimeters are in a meter?

Answer: _____

Item Number: V5

The figure shows how Mary spent her time one day.

What percent of time altogether did she spend playing and doing homework?

A. 10%

B. 15%

C. 20%

D. 25%

E. 30%

Item Number: J3

Kyle and Bob are playing a game. The object of the game is to get the highest total of points. This chart shows how many points they each scored.

Scorecard

Player	Kyle	Bob
Round 1	125	100
Round 2	125	125
Round 3	150	100
Round 4	50	150

Who won, and by how many points?

A. Bob won by 25 points.

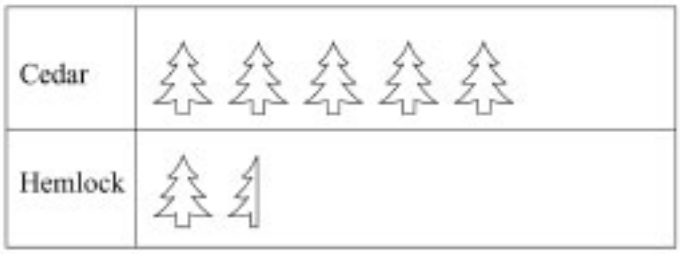
B. Bob won by 100 points.

C. Kyle won by 25 points.

D. Kyle won by 175 points.

Item Number: K4

The graph shows 500 cedar trees and 150 hemlock trees.

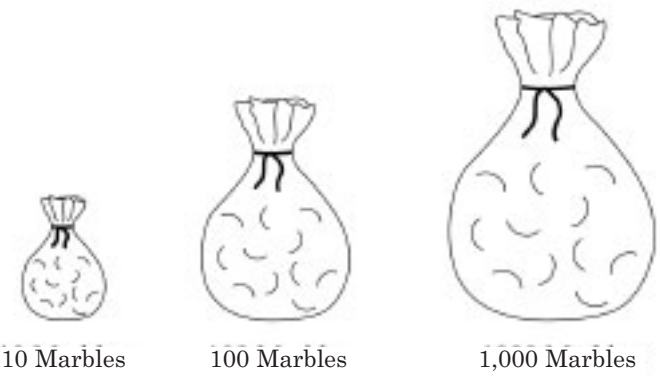


How many trees does each  represent?

Answer: _____

Item Number: L1

There is only one red marble in each of these bags.



Without looking in the bags, you are to pick a marble out of one of the bags. Which bag would give you the greatest chance of picking the red marble?

A. The bag with 10 marbles.

B. The bag with 100 marbles.

C. The bag with 1,000 marbles.

D. All bags would give the same chance.

Item Number: L2

Samantha drops a stone onto each of these targets. The stone has the best chance of landing on a shaded space in which target?

A. 

B. 

C. 

D. 

Item Number: M1

A team is selling raffle tickets. The table shows how many tickets they have sold so far.

Player's Name	Number of Tickets Sold
Carlos	4
Maria	7
Bill	3
Ted	7
Faye	6
Abby	9

They need to sell 60 tickets altogether. How many more tickets must they sell?

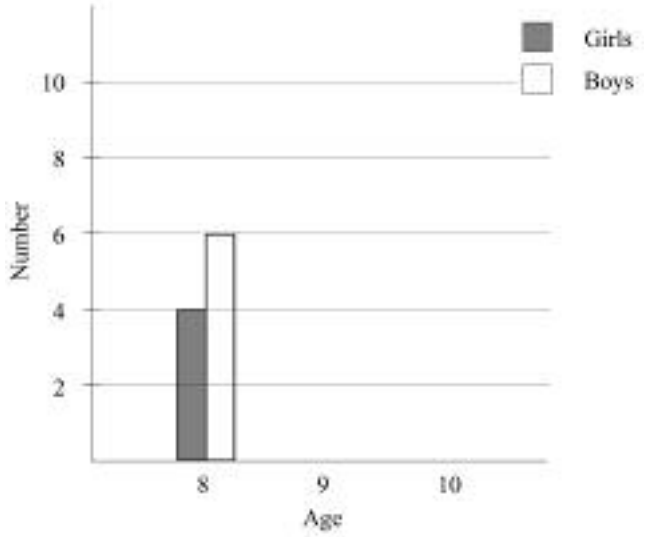
Answer:_____

Item Number: M2

This table shows the ages of the girls and boys in a club.

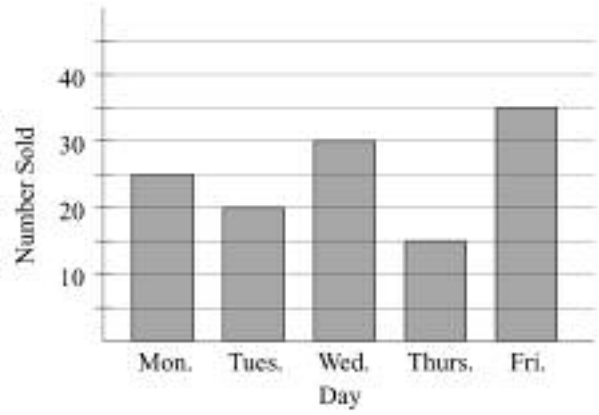
Age	Number of Girls	Number of Boys
8	4	6
9	8	4
10	6	10

Use the information in the table to complete the graph for ages 9 and 10.



Item Number: S1

The graph shows the number of cartons of milk sold each day of a week at a school.



How many cartons of milk did the school sell on Monday?

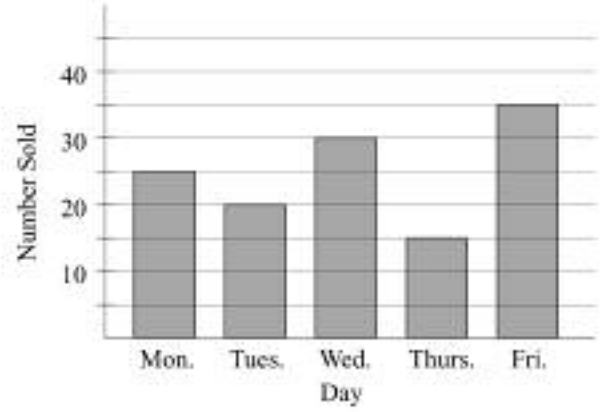
Answer: _____

How many cartons of milk did the school sell that week? Show your work.

Answer: _____

Item Number: T1A

The graph shows the number of cartons of milk sold each day of a week at a school.



How many cartons of milk did the school sell on Monday?

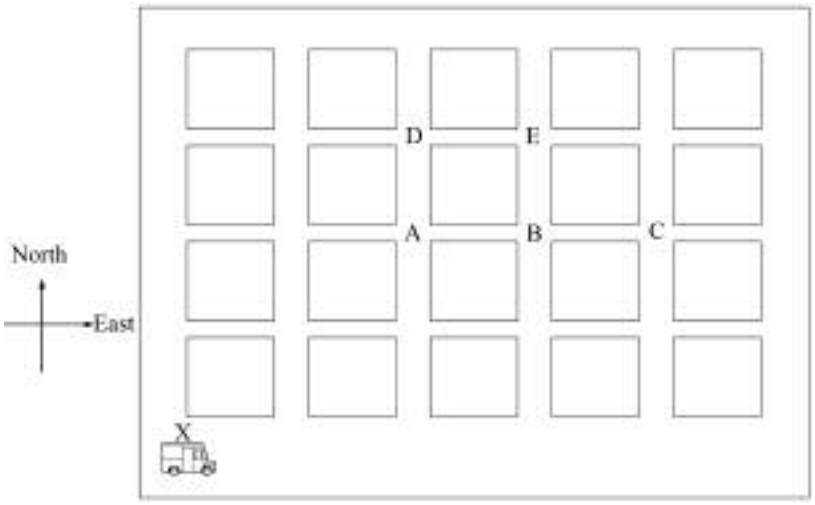
Answer: _____

How many cartons of milk did the school sell that week? Show your work.

Answer: _____

Item Number: T1B

This map shows city blocks with a delivery truck at one corner.

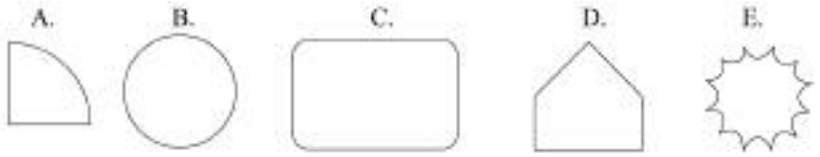


The driver of the delivery truck starts at corner X. He goes 3 blocks east and 2 blocks north to get to the school. On what corner is the school located?

A. A
B. B
C. C
D. D
E. E

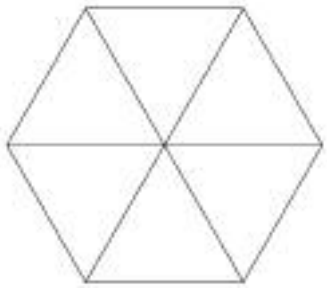
Item Number: I1

Which of these is made with straight sides only?



Item Number: I6

Here is a hexagon.



The hexagon is divided into six

A. triangles

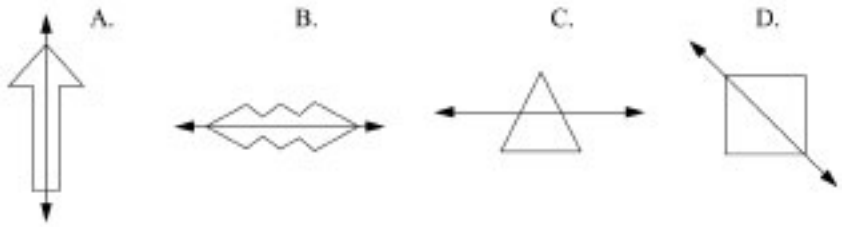
B. squares

C. pentagons

D. rectangles

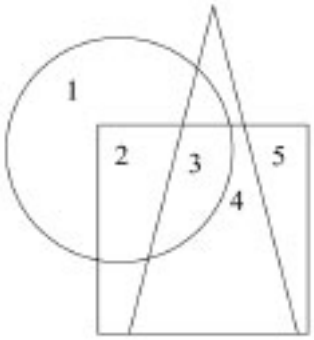
Item Number: J1

Which of these does NOT show a line of symmetry?



Item Number: J2

Here is a figure.



Which number is in the square and the circle but is NOT in the triangle?

A. 2

B. 3

C. 4

D. 5

Item Number: K1

Which rectangle is NOT divided into 4 equal parts?

A. 

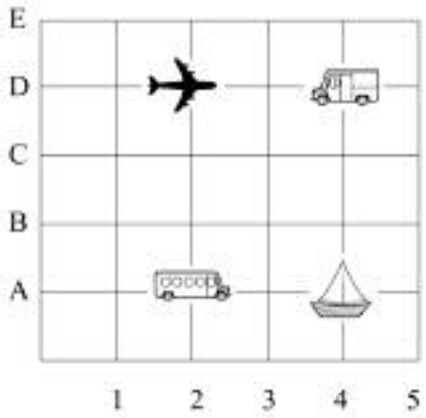
B. 

C. 

D. 

Item Number: K8

This is a game board.



Which object is located at (2, D)?

A. The plane 

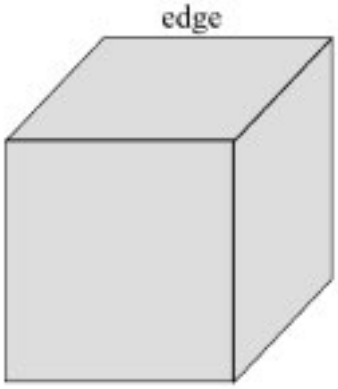
B. The truck 

C. The bus 

D. The boat 

Item Number: L3

This picture shows a cube with one edge marked. How many edges does the cube have altogether?



A. 6

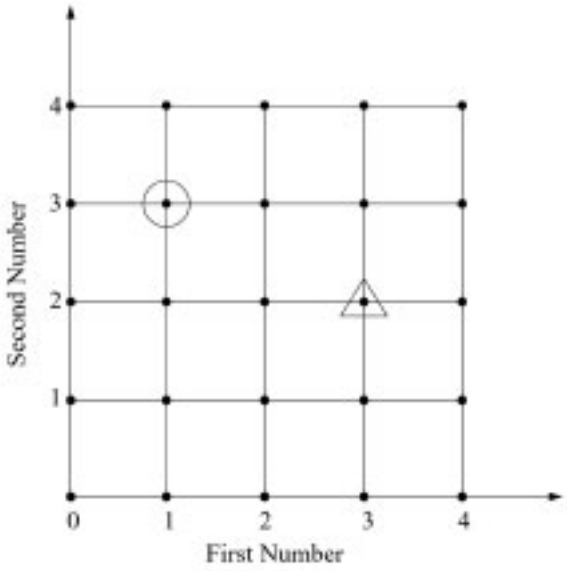
B. 8

C. 12

D. 24

Item Number: L5

On this grid, find the dot with the circle around it. We can describe where this dot is by saying it is at First Number 1, Second Number 3

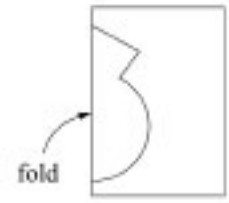


Now find the dot with the triangle around it. Describe where the dot is on the grid in the same way. Fill in the numbers we would use:

First Number _____ Second Number _____

Item Number: M4

Craig folded a piece of paper in half and cut out a shape.



Draw a picture to show what the cut-out shape will look like when it is opened up and flattened out.

Item Number: T5

Tanya has read the first 78 pages in a book that is 130 pages long. Which number sentence could Tanya use to find the number of pages she must read to finish the book?

A. 130 + 78 = ☐

B. ☐ - 78 = 130

C. 130 ÷ 78 = ☐

D. 130 - 78 = ☐

Item Number: I7

What do you have to do to each number in Column A to get the number next to it in Column B?

Column A	Column B
10	2
15	3
25	5
50	10

A. Add 8 to the number in Column A.

B. Subtract 8 from the number in Column A.

C. Multiply the number in Column A by 5.

D. Divide the number in Column A by 5.

Item Number: J5

Which pair of numbers follows the rule "Multiply the first number by 5 to get the second number"?

A. 15 → 3

B. 6 → 11

C. 11 → 6

D. 3 → 15

Item Number: K3

Here is the beginning of a pattern of tiles.

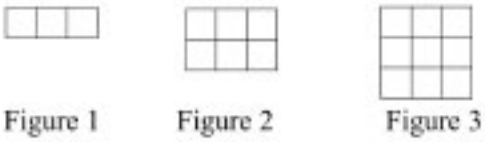


Figure 1 Figure 2 Figure 3

If the pattern continues, how many tiles will be in Figure 6?

A. 12

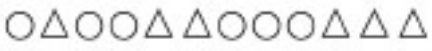
B. 15

C. 18

D. 21

Item Number: K6

These shapes are arranged in a pattern.



Which set of shapes is arranged in the same pattern?

A. 

B. 

C. 

D. 

Item Number: L4

Henry is older than Bill, and Bill is older than Peter. Which statement must be true?

A. Henry is older than Peter.

B. Henry is younger than Peter.

C. Henry is the same age as Peter.

D. We cannot tell who is oldest from the information.

Item Number: L9

Here is a number sentence.

$4 \times \square < 17$

Which number could go in the $\square$ to make the sentence true?

A. 4

B. 5

C. 12

D. 13

Item Number: M9

These numbers are part of a pattern.

50 , 46 , 42 , 38 , 34 , ...

What do you have to do to get the next number?

Answer: _____

Item Number: U4