City of London School for Girls

The North London Independent Girls' School Consortium

Entrance Examination – Group 2

Friday 16th January 2009

MATHEMATICS

Time: 1 hour 15 minutes

Name: _____

Instructions:

Work through the paper without rushing.

Do your work clearly in the space near each question.

Don't rub out your working: you may get marks for it.

If you cannot answer a question, go to the next one.

NO CALCULATORS OR RULERS ARE ALLOWED.

1.
$$\begin{array}{r} 484 \\ +\ 365 \\ \hline \\ \hline \end{array}$$

2.
$$\begin{array}{r} 7608 \\ -\ 495 \\ \hline \\ \hline \end{array}$$

3.
$$\begin{array}{r} 297 \\ \times\ 8 \\ \hline \\ \hline \end{array}$$

4. $9\overline{)2016}$

5. Write the number thirty thousand, two hundred and ninety seven in figures.

Answer:_____

6. On Monday it was -12°C. The temperature rose by 1 °C each day for the next week. What was the temperature on Friday?

Answer: _____

7. Which of these letters do not look the same when reflected in the mirror line shown below?

X A E D Z

---------- mirror line

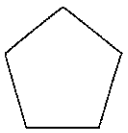
Answer: _____

8. Write down the next two terms in each sequence:

15, 24, 33, 42, ____, ____

2.2, 2.5, 2.8, 3.1, ____, ____

$\frac{1}{3}$, 1, 3, 9, ____, ____



9. a) May is 14 years old and her father is 39 years older than her. May's mother is 8 years younger than her father. How old is May's mother?

Answer: _____

b) Five glass marbles cost a total of £7.50. How many marbles could I buy with £24?

Answer: _____

10. Add the smallest of the following numbers to the largest:

1, 0.13, 0.8, 0.012, 1.238, 0.028

Answer: _____

11. I arrived at the station at 7.47 a.m. My train was due at five past eight but was 13 minutes late.

How long did I have to wait for my train?

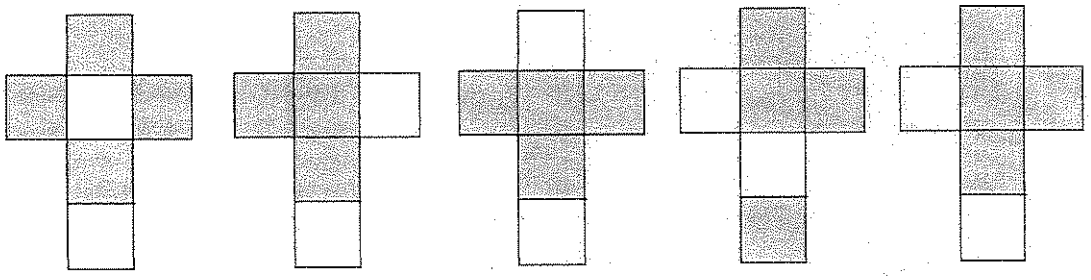
Answer: _____

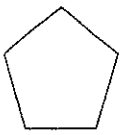
12. You multiply a number by itself. You then multiply the new number by three. The answer is 192.

What is your starting number?

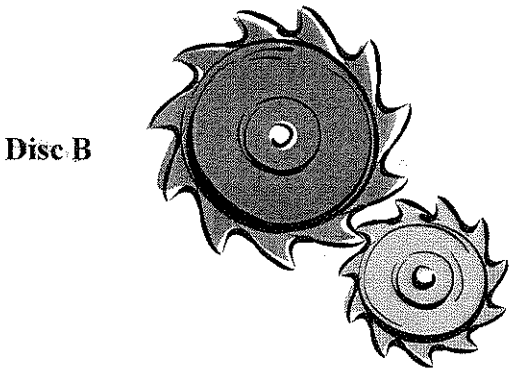
Answer: _____

13. Circle the net which can be folded into a cube that looks different from the others.





14. Disc B turns twice when A turns 5 times. If disc A turns 45 times, how many times does disc B turn?



Answer:_____

15. A box contains 48 pieces of fruit. Five eighths of them are apples and the rest of them are pears. How many pears are there?

Answer:_____

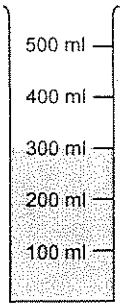
16. Use the symbols +, -, ÷, or x to make each calculation correct.

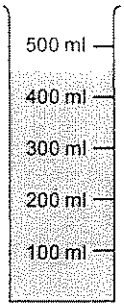
i. 5 ☐ 3 = 12 ☐ 4

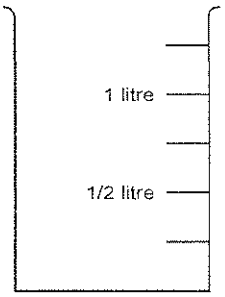
ii. 2 ☐ 3 = 12 ☐ 2

iii. 5 ☐ 5 = 4 ☐ 4

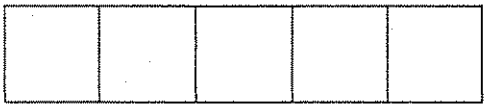
17. All the water from these two beakers is poured into the empty beaker.
Draw a line to show the level of the water in the new beaker.







18. A square has a perimeter of 8cm. Five of these squares are put together in a line to make a rectangle.
What is the area of the rectangle?



Answer: _____

19.

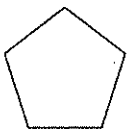
For Sale	
Tomatoes	**£1.50 per pound**
Green Peppers	**40p each**
Cucumbers	**30p each**

Brendan and Sophie got £0.20 change when they paid with £5 for some tomatoes, green peppers and cucumbers which they bought at a farm stand.

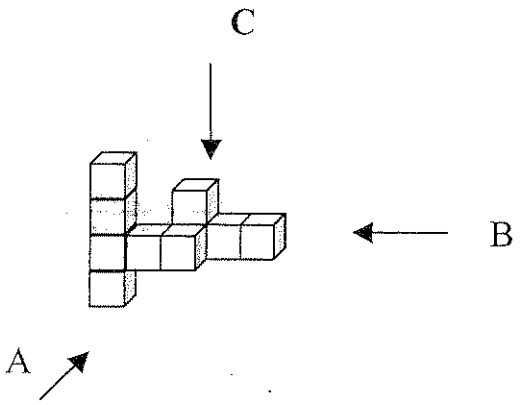
- They bought 5 tomatoes, which weighed 2 pounds altogether.
- They bought two more tomatoes than green peppers.

How many cucumbers did they buy?

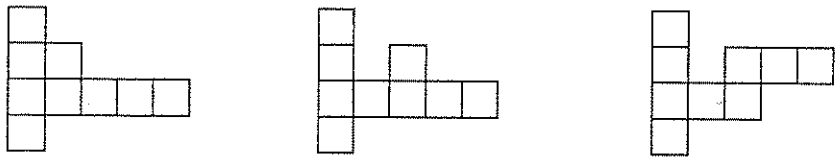
Answer: _____



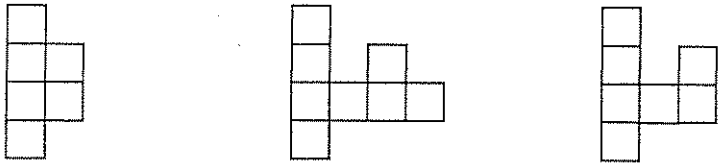
20. The following is a representation of a 3-dimensional shape, made up of cubes.



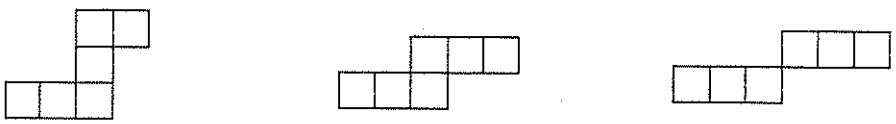
a) Circle the shape that you would see if you were looking at it from A (from the front).



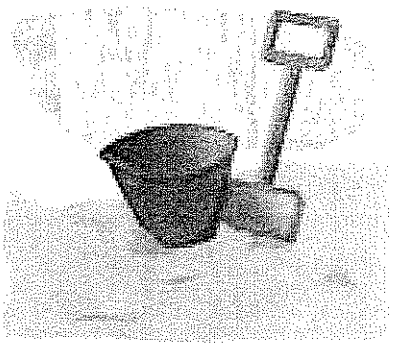
b) Circle the shape that you would see if you were looking at it from B (from the right hand side).



b) Circle the shape that you would see if you were looking at it from C, (from above).



21. Three neighbouring families chose different holidays abroad this year.



Use the clues below to work out their house numbers, their chosen destinations and the months during which they were away.

The families: Brown, Green, Smith
The house numbers: 6, 8, 10
The destinations: Cyprus, Portugal, Spain
The months: May, June, July

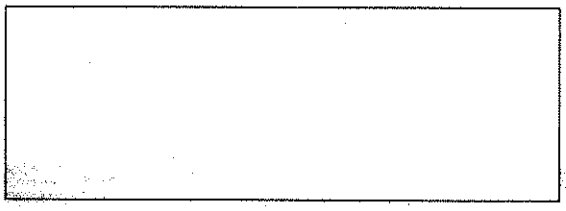
Clues:

1. The Browns, who don't live at No. 8, went to Spain.
2. The Smiths took their holiday in June.
3. One family went to Portugal in July.
4. The Greens live at No. 6.

Name	House No.	Destination	Month
Brown			
Green			
Smith			

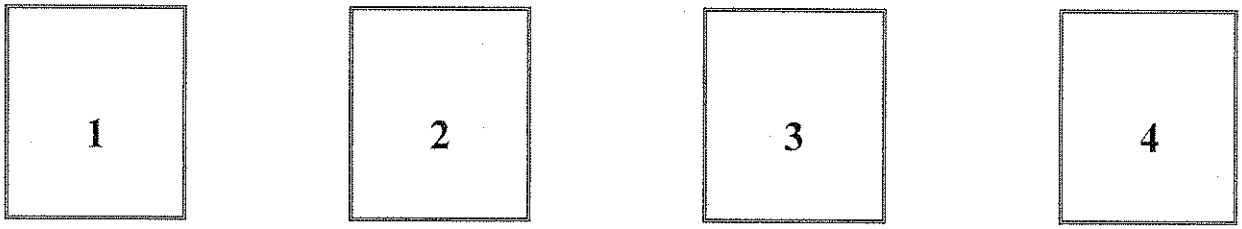
22. A rectangle has an area of 60 cm^2. Its length is 11cm more than its width.

What is the perimeter of the rectangle?



Answer: _____

23. Here are four cards which you can use to make numbers:

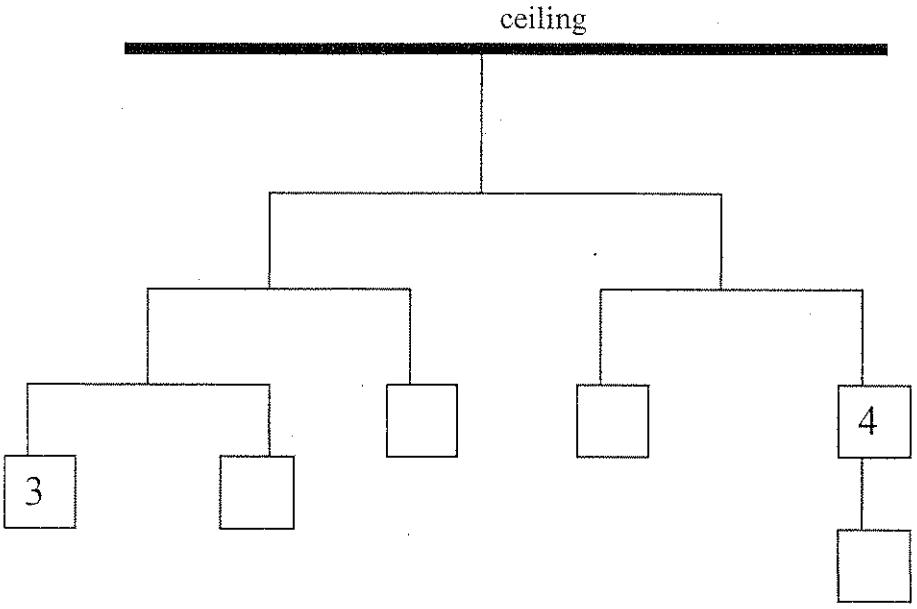


Write down all the possible 4-digit even numbers you can make which are greater than 3000. Write your answers from smallest to biggest.

.....

24. A child's mobile (not phone!) is suspended from a ceiling and has some weights suspended so that each bar is balanced as shown.

Fill in the weights that are missing.



25. A bus started off from a bus station with 24 people.

At the first stop 4 people got off and some people got on.
At the second stop, no one got off but 3 people got on.
There were then 34 people.

How many people got on at the first stop?

Answer: _____

26. Hayfield School girls' football team played Greentops School at home last week. The final score was 3:1. (The home team is listed first.)

Below is a list of possible half time scores, but one has been missed out. Can you find it?

2:1 0:0 2:0 1:1

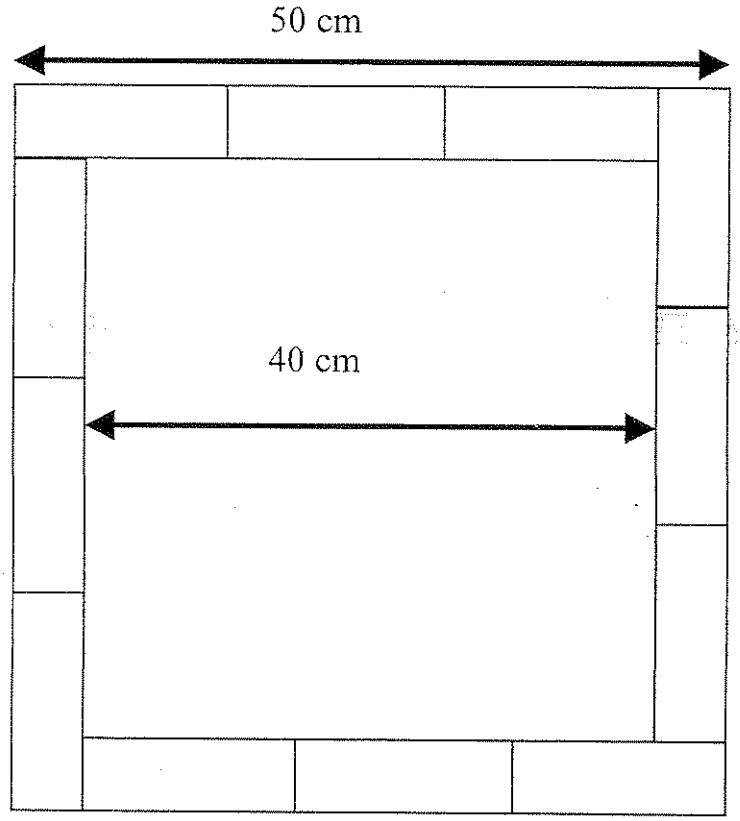
3:0 3:1 1:0

Answer:_____

27. The Jones children take their dogs for a walk.
There are 3 times as many dogs as children.
The total number of legs is 56. How many Jones children are there?

Answer:_____

28.



Twelve rectangles, all the same size, are arranged to make a square, as shown in the diagram above.

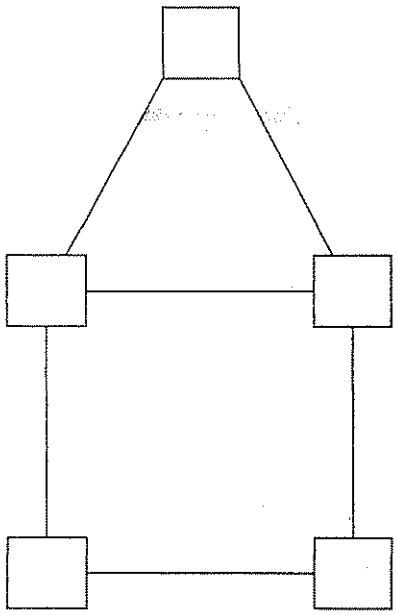
Calculate the area of one of the rectangles.

Answer: _____

29. Fill in the missing digits in this multiplication:

$$\begin{array}{r} 3\square\square \\ \times \quad 7 \\ \hline \square 3\square 6 \\ \hline \end{array}$$

30. Enter the numbers 2, 3, 4, 7, 8 into the boxes on the shape according to the following rules:



a) All 3 numbers in the triangle are even

b) The total of the 4 numbers on the square is 22.

c) The total of numbers on the left hand edge of the square is equal to the total of numbers on the right hand edge.

d) The number in the bottom left hand corner of the square is greater than the number in the bottom right hand corner.

31. Use the fact that 742 x 36 = 26712 to work out these sums:

742 x 360 = _____

26712 ÷ 36 = _____

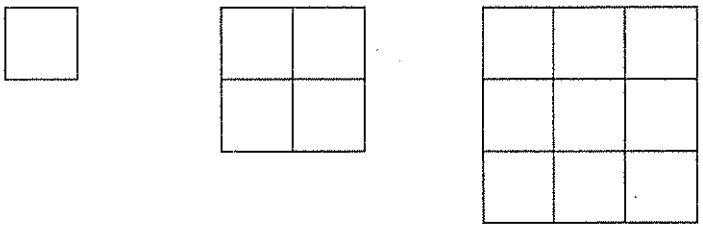
742 x 72 = _____

743 x 36 = _____

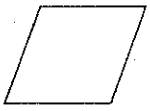
32. Bernard thinks of a number.
When the number is divided by 2, the remainder is 1.
When the number is divided by 3, the remainder is 2.
When the number is divided by 4, the remainder is 3.
When the number is divided by 5, the remainder is 4.
It is less than 80. What is the number?

Answer: _____

33. The second pattern has four small squares and is made from six lines.
How many lines are needed to draw 64 small squares?



Answer: _____



34. On the planet Nodnol, the natives have a special sort of arithmetic using the symbol ✪.

3 ✪ 4 means add 3 and 4 and then add on the product of 3 and 4,
so 3 ✪ 4 = 3 + 4 + (3 x 4) = 19

(a) Find the value of 5 ✪ 7

Answer: _____

(b) Find the value of 2 ✪ $\frac{1}{2}$

Answer: _____

(c) If x ✪ 2 = 23, what number is x ?

Answer: _____

(d) If n ✪ n = 99, what number is n?

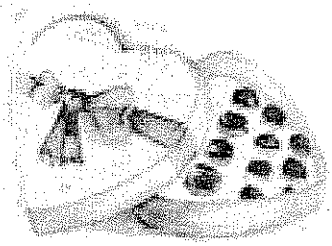
Answer: _____

35. A bat ate 1,050 mosquitoes in four nights.
Each night she ate 25 more than the night before.
How many did she eat on the first night?

Answer: _____

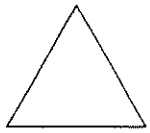
36. A box of chocolates contains 24 chocolates. Each chocolate is either milk chocolate or dark chocolate. All the chocolates have centres, which are either toffee or nut (not both).

There are 5 milk chocolates with a nut centre. There are 10 dark chocolates altogether, and 15 toffees altogether.



How many dark chocolate toffees are there?

Answer: _____



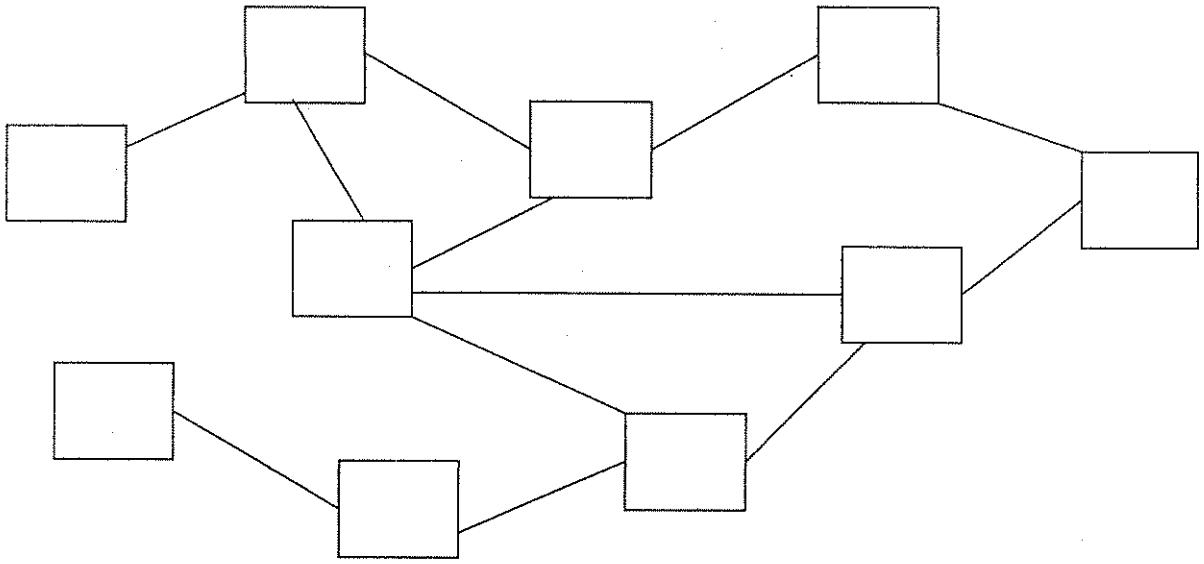
37. Ten girls live in ten different houses.

The boxes on the diagram represent the girls' houses.

The lines joining the houses show that the two girls from these houses have met.

The girls that have met are:

Ella and Alison
Dee and Fiona
Gita and Bella
Alison and Justyna
Crystal and Ingrid
Ingrid and Dee
Hiba and Justyna
Justyna and Gita
Ingrid and Hiba
Hiba and Alison
Dee and Hiba
Crystal and Ella



Put the first letter of the girl's name in the correct house.

38. (a) A school gate can be opened using the correct combination of digits in the correct order.

When 418 is tried, one digit is wrong.
When 238 is tried, one digit is wrong.
When 437 is tried, one digit is still wrong.

What is the correct combination?

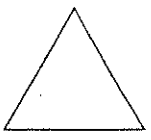
Answer: _____

(b) Another school gate needs the correct combination of four digits in the correct order.

When 5648 is tried, two digits are wrong
When 3628 is tried, two digits are wrong
When 3147 is tried, two digits are wrong
When 5629 is tried, two digits are still wrong
When 1258 is tried, *all* the digits are wrong.

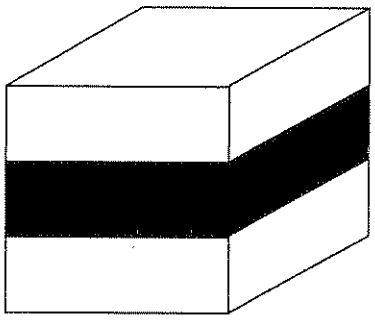
What is the correct combination of digits?

Answer: _____



39. A sweet is in the shape of a cube. It is made up of three layers of equal thickness, as shown in the diagram.

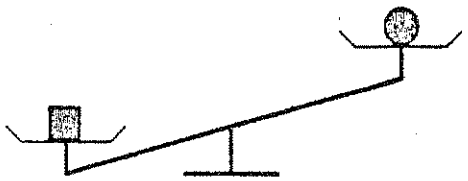
What fraction of the outside is black?



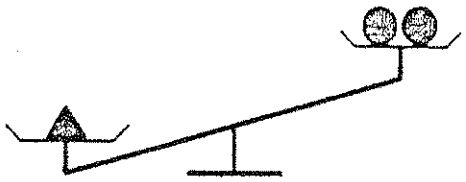
Answer: _____

40. Jane is trying to work out the weights of some shapes. She knows that the weights are whole numbers less than 10kg. The pictures show what Jane finds out. For example, picture (1) shows that the square is heavier than the circle.

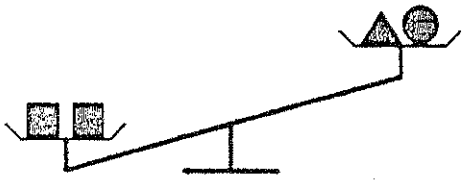
(1)



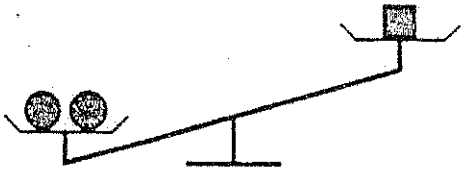
(2)



(3)



(4)



(a) What does picture (2) show?

Answer: _____

(b) Is the square heavier than the triangle?

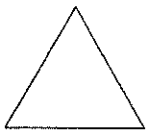
Answer: _____

(c) What are the weights of the shapes?

 _____

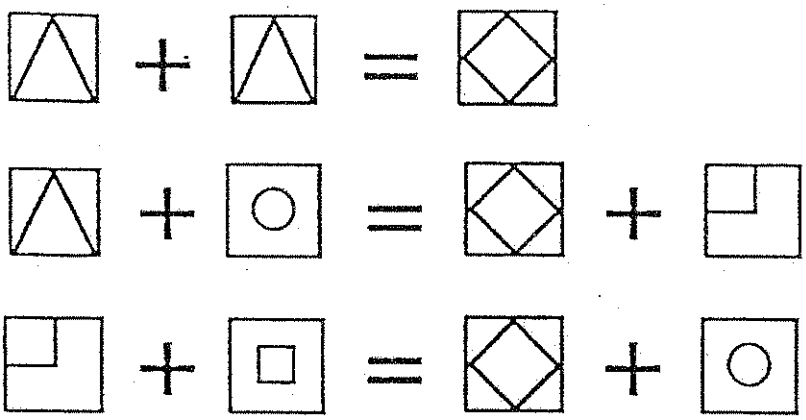
 _____

 _____

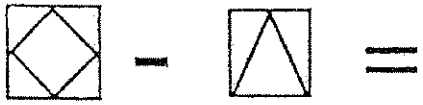


41. On the island of Mathia the people use patterns instead of numbers like ours.

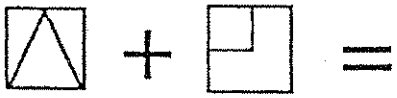
Here are some facts about Mathian numbers.



Now answer these questions (Each answer is one Mathian number).

a) 

Answer: _____

b) 

Answer: _____

c) 

Answer: _____