

11plusexams.com (visuteach.com) North London Independent Girls' Schools' Consortium 11+ Maths Sample Test (Group 2)

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Do your rough work 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.

Questions

1. Some children form a circle. They are evenly spaced and the 5th child is directly opposite the 14th child. How many children are there altogether?

Answer: _____

2. Each symbol has a different value. When you add up the value of all the symbols in one row or column, you get the total value for that row or column. Find the value of each symbol.

				64
				76
				76
				76
?	76	72	76	

 =
  =
  =
 ? =

3. A briefcase can be opened using the correct combination of 3 digits in the correct order.

Mary tries the following 3 digits:

She tries 259, but one digit is wrong

She tries 658, but one digit is wrong

She tries 649, but one digit is wrong

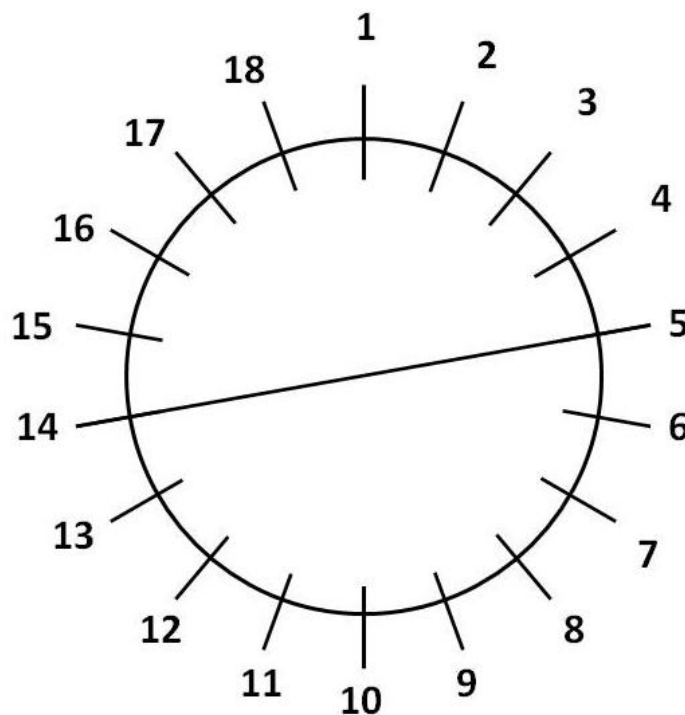
What is the correct combination?

Answer: _____

Answers

1. Child 5 and child 14 are directly opposite each other, and therefore they lie on a diameter of the circle, and they are the endpoints of a semicircle. The children between them lie on that semicircle. Ignoring the endpoints of the semicircle (i.e. the 5th and the 14th child) there are 8 children between them (i.e. children number 6, 7, 8, 9, 10, 11, 12 and 13). The opposite semicircle will have the same number of children (i.e. 8) and we also have the two children at the endpoints of the semicircle (i.e. children 5 and 14). Therefore, altogether, there are $8+8+2 = 18$ children.

The following diagram makes it clearer:



2. To make it easier to manipulate the symbols, rename them as letters of the alphabet. An example is as follows:

$$\blacksquare = a \quad \blacktriangle = b \quad \ominus = c$$

Then from row 1 we have $2a+2b = 64$.

From row 2 we have $a+b+2c = 76$.

From column 3 we have $a+2b+c = 72$.

Note we only choose the rows and columns that have distinct sums (i.e. we only

choose one row which has a sum of 76. There is no need to include it more than once, since it is the same each time).

$$2a+2b = 64, \text{ so } a+b = \frac{64}{2} = 32$$

From row 3 we have $a+b+2c = 76$
and we know that $a+b = 32$, so we can rewrite this as

$$32+2c = 76, \text{ so } 2c = 76 - 32 = 44, \text{ so } c = \frac{44}{2} = 22$$

From column 3, we know that $a+2b+c = 72$ and we can rewrite this as
 $a+b+b+c = 72$.

We know that $a+b = 32$ and that $c = 22$, so we can rewrite it as

$$32+b+22 = 72$$

$$\text{so } b+54 = 72 \text{ i.e. } b = 72-54 = 18$$

We know that $a+b = 32$ and that $b = 18$, so we can say that
 $a+18 = 32$ i.e. $a = 32-18 = 14$

Column 1 is the column which sums up to the ? and it is
 $2a+b+c = ?$

We know that $a = 14$, $b = 18$ and $c = 22$, so we have

$$2 \times 14 + 18 + 22 = ?$$

$$\text{i.e. } 28 + 18 + 22 = ?$$

$$\text{so } ? = 68$$

Therefore the answers are:

$$\blacksquare = 14 \quad \blackslash = 18 \quad \textcircled{\diagdown} = 22 \quad ? = 68$$

3. Look at the first digit of each of the three codes and notice that the digit 6 appears twice in the first position.

Assume that this 6 is wrong. Then this would mean that the 58 in 658 must be correct, since only one digit can be wrong and the other two are right. But it would also mean that the 49 in 649 must be correct. But it is impossible for both 58 and 49 to be correct, since we can only have one correct digit in each position i.e. we cannot have both 5 and 4 correct in the second position of the 3 digit code.

Therefore, the 6 in the first position of the code cannot be wrong. It must be right. If the 6 is right, then the 2 in 259 must be wrong and this means that the 59 in 259 must be correct (since we know that only one digit is wrong in 259). Therefore the correct code must be 659.

Answer Sheet

1. 18

2.

$$\blacksquare = 14 \quad \blacktriangleleft = 18 \quad \ominus = 22 \quad ? = 68$$

3. 659