Mathematics test

Paper 1
Calculator not allowed

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name and the name of your school in the spaces below.

First name

Last name

School

Remember

▪ The test is 1 hour long.
▪ You must not use a calculator for any question in this test.
▪ You will need: pen, pencil, rubber, ruler, mirror and tracing paper (optional).
▪ This test starts with easier questions.
▪ Try to answer all the questions.
▪ Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.
▪ Check your work carefully.
▪ Ask your teacher if you are not sure what to do.

For marker’s use only

Total marks
Instructions

Answers
This means write down your answer or show your working and write down your answer.

Calculators
You must not use a calculator to answer any question in this test.
1. Fill in the missing numbers.

\[
\begin{align*}
68 & \quad + \quad \boxed{\quad} \quad = \quad 100 \\
20 & \quad \times \quad \boxed{\quad} \quad = \quad 100 \\
300 & \quad \div \quad \boxed{\quad} \quad = \quad 100 \\
65 & \quad \times \quad 2 \quad - \quad \boxed{\quad} \quad = \quad 100
\end{align*}
\]
2. The tables show information about 5 pupils.

This table shows which school clubs they go to.

<table>
<thead>
<tr>
<th>School Clubs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Chess</td>
</tr>
<tr>
<td>Ann</td>
</tr>
<tr>
<td>Mike</td>
</tr>
<tr>
<td>Paul</td>
</tr>
<tr>
<td>Sule</td>
</tr>
<tr>
<td>Tamsin</td>
</tr>
</tbody>
</table>

This table shows how many pets they have.

<table>
<thead>
<tr>
<th>Pets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Cats</td>
</tr>
<tr>
<td>Ann</td>
</tr>
<tr>
<td>Mike</td>
</tr>
<tr>
<td>Paul</td>
</tr>
<tr>
<td>Sule</td>
</tr>
<tr>
<td>Tamsin</td>
</tr>
</tbody>
</table>
Use the tables to answer these questions.

(a) How many of the pupils go to the French Club?

(b) Which club does Tamsin go to?

(c) Who has the greatest number of pets?

(d) One pupil said:

When I was at French Club last night, my cat had kittens.

Who is the only pupil that could have said this?
3. This question is about number pyramids.

You **add two numbers** to work out the number that goes on top of them.

(a) Complete the number pyramid below.

(b) Complete the number pyramid below in two **different** ways.
4. (a) A shopkeeper stacks tins.

In each layer there are the same number of tins.

How many tins are in each stack below?

(b) The shopkeeper stacks jars in layers.

Each layer looks like this.

How many jars will be in the stack when it is 5 layers high?

(c) The shopkeeper stacks 30 boxes in layers.

In each layer there are 5 boxes.

How many layers high is the stack?
5. (a) Add together 147 and 376

(b) Subtract 36 from 218

(c) Multiply 49 by 3

(d) Divide 160 by 4
6. There are **seven different ways** to make **8p** with coins.

Complete the table to show the seven ways to make 8p. Two have been done for you.

<table>
<thead>
<tr>
<th>Number of 5p coins</th>
<th>Number of 2p coins</th>
<th>Number of 1p coins</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

3 marks
7. The diagram shows a matchbox.
   Its length is 5.3 cm. Its width is 3.6 cm. Its height is 1.5 cm.

(a) I join two matchboxes in different ways.
   Fill in the missing values.

   Not drawn accurately

   length = cm

   width = cm

   height = cm
(b) I start joining matchboxes like this:

How many matchboxes will be in the pile when its height is 12 cm?
8. When you fold a square along a diagonal, you see a triangle.

(a) What do you see when you fold a rectangle along a diagonal?

Ring the correct answer below.

1 mark
(b) Three different shapes are folded along a line of symmetry. For each shape, the dashed line is the fold line.

For each shape, draw what the shape looked like before it was folded.
9. I buy a widescreen television costing £1290
   I pay £900 now, then
   I pay the rest of the money in 3 equal payments.
   How much is each payment?
   Show your working.

10. Steve needs to put 1 litre of water in a bucket.
    He has a 500ml jug.
    Explain how he can measure 1 litre of water.
11. The diagram shows some shapes on a 10 by 6 square grid.

(a) Which two shapes have the same area as shape A?

(b) Which two shapes have the same perimeter as shape A?

(c) How many of shape C would you need to cover a 10 by 6 square grid?
12. The bar charts show how many pupils went to a maths club.
Is each statement below true or false, or is there not enough information to tell?
Tick (✓) the correct box.

(a) In each of these weeks, the day with the most pupils was Monday.

- True
- False
- Not enough information

Explain your answer.

(b) In each of these weeks, the same number of pupils went to the club on Friday.

- True
- False
- Not enough information

Explain your answer.

(c) In each of these weeks, the same pupils went to the club on Friday.

- True
- False
- Not enough information

Explain your answer.
13. The diagram shows two straight lines. Where the lines cross is called a point of intersection.

(a) Draw three straight lines that have only one point of intersection.

(b) Now draw three straight lines that have three points of intersection.

(c) Three straight lines have exactly two points of intersection. Complete the sentence below.

Two of the lines must be ________________________________
14. The graph shows at what time the sun rises and sets in the American town of Anchorage.

The day with the **most** hours of daylight is called the longest day.

Fill in the gaps below, using the information from the graph.

The *longest day* is in the month of ..........................

On this day, there are about .......... hours of daylight.

The *shortest day* is in the month of ..........................

On this day, there are about .......... hours of daylight.

3 marks
15. I buy a box of different size plasters.
Assume each plaster is equally likely to be the top plaster inside the box.

Altogether there are 35 plasters.
I take the top plaster from inside the box.

(a) What is the probability that the plaster is of size D?

(b) What is the probability that the plaster is of size A?

(c) What is the probability that the plaster is not of size A?
16. You can buy a new calculator for £1.25

In 1979 the same type of calculator cost 22 times as much as it costs now.

How much did the same type of calculator cost in 1979?

Show your working.

£
17. A company sells books using the internet.

The graph shows their delivery charges.
(a) Use the graph to fill in the values in this table.

<table>
<thead>
<tr>
<th>Number of books</th>
<th>Delivery charge (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

1 mark

(b) For every extra book you buy, how much more must you pay for delivery?

......... p

1 mark

(c) A second company sells books using the internet.

Its delivery charge is **£1.00 per book**.

On the graph opposite, draw a line to show this information.

1 mark

(d) Complete the sentence.

Delivery is cheaper with the **first** company

if you buy at least ............ books.

1 mark
18. One way to make a magic square is to substitute numbers into this algebra grid.

\[
\begin{array}{ccc}
  a + b & a - b + c & a - c \\
  a - b - c & a & a + b + c \\
  a + c & a + b - c & a - b \\
\end{array}
\]

(a) Complete the magic square below using the values

\[ a = 10 \quad b = 3 \quad c = 5 \]

\[
\begin{array}{ccc}
  & & 5 \\
  & 10 & \\
 15 & & \\
\end{array}
\]
(b) Here is the algebra grid again.

$$
\begin{array}{|c|c|c|}
\hline
a + b & a - b + c & a - c \\
\hline
a - b - c & a & a + b + c \\
\hline
a + c & a + b - c & a - b \\
\hline
\end{array}
$$

I use different values for $a$, $b$ and $c$ to complete the magic square.

$$
\begin{array}{|c|c|c|}
\hline
20 & 21 & 7 \\
\hline
3 & 16 & 29 \\
\hline
25 & 11 & 12 \\
\hline
\end{array}
$$

What values for $a$, $b$ and $c$ did I use?

\[a = \ldots \quad b = \ldots \quad c = \ldots\]
19. Look at this diagram.

The diagram can help you work out some fraction calculations.

Calculate

\[
\frac{1}{12} + \frac{1}{4} =
\]

1 mark

\[
\frac{1}{3} + \frac{1}{4} =
\]

1 mark

\[
\frac{1}{3} - \frac{1}{6} =
\]

1 mark
END OF TEST