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, tracing paper and mirror (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. The shapes below are drawn on square grids. Each shape has \textbf{one line of symmetry}.

Draw the line of symmetry on each shape.
2. This number line shows one way to use two steps to move from 0 to 20

(a) On the number line below, show a different way to use two steps to move from 0 to 20

(b) This number line shows how to use four steps of the same size to move from 0 to 20

Complete the sentence below.

Each step is add __________
(c) Write the missing number on each number line to show how to move from 0 to 20

- Add 9
- Add 5
- Add ___

- Add $17\frac{1}{2}$
- Add ___

- Add 28
- Subtract ___
3. The table shows some temperatures for one day in winter.

<table>
<thead>
<tr>
<th>Place</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside my house</td>
<td>20°C</td>
</tr>
<tr>
<td>Inside my greenhouse</td>
<td>8°C</td>
</tr>
<tr>
<td>Outside</td>
<td>−2°C</td>
</tr>
</tbody>
</table>

Draw arrows on the diagrams below to show these temperatures. The first one is done for you.
4. There are **28 pupils** in class 9K.

The chart shows the number of pupils **present** each day, in class 9K.

![Number of pupils present chart]

Four pupils were absent on Monday.

Complete the chart below to show the number of pupils **absent** each day, in class 9K.

![Number of pupils absent chart]
5. A shop sells three different sized bottles of lemonade.

(a) I want 3 litres of lemonade.
I could buy three bottles of size 1 litre.

How much would that cost?

£

(b) Write a different way I could buy exactly 3 litres of lemonade.

Now work out how much it would cost.

£
(c) Write another different way I could buy exactly 3 litres of lemonade.

Now work out how much it would cost.

£

1 mark

(d) My friend buys seven bottles of lemonade.

Two of the bottles are of size \( \frac{3}{2} \) litres.

Five of the bottles are of size 2 litres.

How many litres is that altogether?

\[ \underline{\ \text{litres}} \]

2 marks
6. (a) Work out

\[ 37 + 46 = \]

\[ 37 \times 5 = \]

(b) What number do you need to add to 63 to make 100?

(c) What number do you need to subtract from 100 to make 38?
7. On each spinner **write five numbers** to make the statements correct.

It is **certain** that you will get a number **less than 6**

It is **more likely** that you will get an **even** number than an **odd** number.

It is **impossible** that you will get a **multiple of 3**
8. **Add three** to the number on each number line. The first one is done for you.
9. Work out the missing numbers. In each part, you can use the first line to help you.

(a) \[ 16 \times 15 = 240 \]
    \[ 16 \times \_ = 480 \]

(b) \[ 46 \times 44 = 2024 \]
    \[ 46 \times 22 = \_ \]

(c) \[ 600 \div 24 = 25 \]
    \[ 600 \div \_ = 50 \]
10. Red Kites are large birds that were very rare in England.

Scientists set free some Red Kites in 1989 and hoped they would build nests.

The diagrams show how many nests the birds built from 1991 to 1996.

**Key:**
- × shows where the birds were set free.
- □ represents a nest without eggs.
- • represents a nest with eggs.
Use the diagrams to answer these questions.

(a) Which was the first year there were nests with eggs?

(b) In 1993, how many nests were there without eggs?

(c) In 1995, how many nests were more than 10 km from where the birds were set free?

(d) Explain what happened to the number of nests, over the years.

Now explain what happened to the distances of the nests from where the birds were set free, over the years.
11. (a) **Add** together 1740 and 282

(b) **Now add** together 17.4 and 2.82
You can use part (a) to help you.

(c) \(3.5 + 2.35\) is **bigger** than \(3.3 + 2.1\)
How much bigger?
Completing quadrilaterals

12. (a) The line on the square grid below is one side of a square.
Draw 3 more lines to complete the square.

(b) The line on the square grid below is one side of a quadrilateral.
The quadrilateral has only one pair of parallel sides.
Draw 3 more lines to show what the quadrilateral could be.
13. (a) Show that \(9 \times 28\) is \(252\)

(b) What is \(27 \times 28\)?

You can use part (a) to help you.
14. A ruler costs $k$ pence.
A pen costs $m$ pence.

Match each statement with the correct expression for the amount in pence.
The first one is done for you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Expression</th>
</tr>
</thead>
<tbody>
<tr>
<td>The total cost of 5 rulers</td>
<td>$5k$</td>
</tr>
<tr>
<td>The total cost of 5 rulers and 5 pens</td>
<td>$5m$</td>
</tr>
<tr>
<td>How much more 5 pens cost than 5 rulers</td>
<td>$5 - 5m$</td>
</tr>
<tr>
<td>The change from £5, in pence, when you buy 5 pens</td>
<td>$500 - 5m$</td>
</tr>
<tr>
<td>How much more 5 pens cost than 5 rulers</td>
<td>$5k + m$</td>
</tr>
<tr>
<td>The change from £5, in pence, when you buy 5 pens</td>
<td>$5(k + m)$</td>
</tr>
<tr>
<td>The change from £5, in pence, when you buy 5 pens</td>
<td>$5m - 5k$</td>
</tr>
<tr>
<td>The change from £5, in pence, when you buy 5 pens</td>
<td>$5k - 5m$</td>
</tr>
</tbody>
</table>
15. (a) I have a square piece of paper.

The diagram shows information about this square labelled A.

\[ \text{Area} = 8 \times 8 = 64 \text{ cm}^2 \]
\[ \text{Perimeter} = 4 \times 8 = 32 \text{ cm} \]

I fold square A \textbf{in half} to make rectangle B.

\[ \text{Area} = 4 \times 8 = 32 \text{ cm}^2 \]
\[ \text{Perimeter} = 2 \times (4 + 8) = 24 \text{ cm} \]

Then I fold rectangle B \textbf{in half} to make square C.

\[ \text{Area} = 4 \times 4 = 16 \text{ cm}^2 \]
\[ \text{Perimeter} = 4 \times 4 = 16 \text{ cm} \]

Complete the table below to show the area and perimeter of each shape.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Area</th>
<th>Perimeter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square A</td>
<td>cm²</td>
<td>cm</td>
</tr>
<tr>
<td>Rectangle B</td>
<td>cm²</td>
<td>cm</td>
</tr>
<tr>
<td>Square C</td>
<td>cm²</td>
<td>cm</td>
</tr>
</tbody>
</table>

3 marks
(b) I start again with square A.

Then I fold it in half to make triangle D.

What is the area of triangle D?

\[ \text{cm}^2 \]

(c) One of the statements below is true for the perimeter of triangle D.

Tick (✓) the correct one.

- The perimeter is less than 24 cm.
- The perimeter is 24 cm.
- The perimeter is greater than 24 cm.

Explain your answer.
16. (a) Work out the missing values.

\[
\begin{align*}
10\% \text{ of } 84 &= \underline{____} \\
5\% \text{ of } 84 &= \underline{____} \\
2\frac{1}{2}\% \text{ of } 84 &= \underline{____}
\end{align*}
\]

(b) The cost of a CD player is £84 plus \(17\frac{1}{2}\%\) tax.

What is the total cost of the CD player?

You can use part (a) to help you.

\[
£
\]
17. Solve these equations.

\[ 2k + 3 = 11 \]

\[ k = \boxed{4} \]  

1 mark

\[ 2t + 3 = -11 \]

\[ t = \boxed{-7} \]  

1 mark
18. (a) I am thinking of a number.
   My number is a **multiple of 4**

   Tick (✓) the true statement below.

   My number must be even  My number must be odd  My number could be odd or even

   Explain how you know.

   1 mark

(b) I am thinking of a **different** number.
   My number is a **factor of 20**

   Tick (✓) the true statement below.

   My number must be even  My number must be odd  My number could be odd or even

   Explain how you know.

   1 mark
19. Look at this sequence of patterns made with hexagons.

To find the number of hexagons in pattern number $n$ you can use these rules:

Number of grey hexagons = $n + 1$
Number of white hexagons = $2n$

Altogether, what is the total number of hexagons in pattern number 20?
END OF TEST
END OF TEST