<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>First name</td>
<td></td>
</tr>
<tr>
<td>Middle name</td>
<td></td>
</tr>
<tr>
<td>Last name</td>
<td></td>
</tr>
<tr>
<td>Date of birth</td>
<td>Day</td>
</tr>
<tr>
<td></td>
<td>Month</td>
</tr>
<tr>
<td></td>
<td>Year</td>
</tr>
<tr>
<td>School name</td>
<td></td>
</tr>
<tr>
<td>DfE number</td>
<td></td>
</tr>
</tbody>
</table>

Mathematics

Paper 3: reasoning
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Please do not write on this page.
Instructions

You **must not** use a calculator to answer any questions in this test.

Questions and answers

You have **40 minutes** to complete this test.

Follow the instructions for each question.

Work as quickly and as carefully as you can.

If you need to do working out, you can use the space around the question.

Do not write over any barcodes.

**Some questions have a method box like this:**

Show your method

For these questions, you may get a mark for showing your method.

If you cannot do a question, **go on to the next one**.
You can come back to it later, if you have time.

If you finish before the end, **go back and check your work**.

Marks

The number under each line at the side of the page tells you the number of marks available for each question.
These shapes have a fraction shaded.

Match each shaded fraction of a circle to the same shaded fraction of a rectangle.

One has been done for you.
The temperature in a freezer is –40°C.

The temperature increases by 10°C.

What is the new temperature?

°C

1 mark
Jack buys milk and orange juice from a shop.

He pays with a £5 note.

**How much change does Jack get?**

Show your method

£
4. The diameter of the Moon is 3,476 kilometres. What is this diameter to the nearest hundred kilometres?

5. Match each of these Roman numerals to the correct number. One has been done for you.

- CVI 1110
- DXC 106
- DLXXI 590
- MCX 571
Match each fraction to its equivalent simplified fraction.

One has been done for you.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Simplified fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/20</td>
<td>4/5</td>
</tr>
<tr>
<td>12/15</td>
<td>2/3</td>
</tr>
<tr>
<td>12/16</td>
<td>3/5</td>
</tr>
<tr>
<td>12/18</td>
<td>2/3</td>
</tr>
</tbody>
</table>
Emma thinks of a number. She says,

I multiply by 2
I add 11
I divide by 3
My answer is 9

What number did Emma think of?
Here is a shape.

Draw the shape after it is translated 8 units to the right.

Use a ruler.
Write the missing numbers in the table.

<table>
<thead>
<tr>
<th>Number of weeks</th>
<th>Number of days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>105</td>
</tr>
</tbody>
</table>
What is the perimeter of the shape, in millimetres?
Use a ruler.

Measure the size of angle $d$.
Use an angle measurer.

$d$ is $\boxed{}^{\circ}$
11 Write the missing digits to make this subtraction correct.

\[
\begin{array}{c}\hspace{1cm}5\hspace{0.5cm}7\hspace{0.5cm}\boxed{} \\
-\hspace{0.5cm}3\hspace{0.5cm}\boxed{}\hspace{0.5cm}5 \\
\boxed{}\hspace{0.5cm}6\hspace{0.5cm}8 \\
\end{array}
\]

2 marks

12 Here are four fractions.

\[\frac{7}{8}\quad \frac{1}{5}\quad \frac{3}{4}\quad \frac{8}{10}\]

Write the fractions in order starting with the least.

least

1 mark
There are 20 boxes on a truck.

The boxes are in 4 different sizes.

What is the total mass of the 20 boxes on the truck?
Look at the data in this table.

<table>
<thead>
<tr>
<th>Label</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>20%</td>
</tr>
<tr>
<td>B</td>
<td>25%</td>
</tr>
<tr>
<td>C</td>
<td>15%</td>
</tr>
<tr>
<td>D</td>
<td>30%</td>
</tr>
<tr>
<td>E</td>
<td>10%</td>
</tr>
</tbody>
</table>

Using this data, draw **two** lines and write **three** labels to complete the pie chart.

Use a ruler.
35% of the 680 pupils at a school have a pet dog.

159 of the pupils who have a pet dog are boys.

How many of the pupils who have a pet dog are girls?
16 Write a number in the box to make this correct.

\[
\frac{3}{5} < \underline{\hspace{2cm}} < 0.7
\]

1 mark

17 Tick the numbers that are factors of both 54 and 72

2
3
4
8
9

1 mark
Layla wants to buy a camera that costs £65

For the first 10 weeks, she saves £2 each week.
Then she saves £3 each week.

How many weeks altogether does it take Layla to save £65?
20. Here are four shapes on a grid.

Write the letters of all the shapes that have only two acute angles.
A band holds a concert for charity.

The tickets cost £27 each.

They sell 635 tickets.

They pay £3,180 to use the hall.

They give one-third of the remaining amount to charity.

How much money does the band give to charity?
Sarah makes jewellery using black and white beads.

She uses this rule to work out how many black beads to use.

\[ \text{black} = (\text{white} \times 3) + 4 \]

Sarah uses 12 white beads to make a necklace.

How many black beads does she use?

Sarah uses 25 black beads to make a bracelet.

How many white beads does she use?
23. Complete the table.

<table>
<thead>
<tr>
<th>Name of 3-D shape</th>
<th>Number of faces</th>
</tr>
</thead>
<tbody>
<tr>
<td>cube</td>
<td></td>
</tr>
<tr>
<td>pentagonal prism</td>
<td></td>
</tr>
<tr>
<td>triangular-based pyramid</td>
<td></td>
</tr>
</tbody>
</table>

1 mark

24. \(\frac{1}{2} \times \frac{5}{6}\) is greater than the value of \(\frac{1}{3} \times \frac{7}{8}\). Explain how you know.

1 mark
[END OF TEST]
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2024 key stage 2 mathematics
Paper 3: reasoning

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