# 2016 national curriculum tests

## Key stage 2

### Mathematics

**Paper 3: reasoning**

<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>
You may 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:

![Method Box]

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 maximum number of marks for each question.
The numbers in this sequence increase by 14 each time.

Write the missing numbers.

\[
\begin{array}{cccc}
\square & 82 & 96 & \square \\
\square & 124 & 138 & \square
\end{array}
\]

2 marks
This table shows the temperature at 9am on three days in January.

<table>
<thead>
<tr>
<th></th>
<th>1st January</th>
<th>8th January</th>
<th>15th January</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>+ 5°C</td>
<td>- 4°C</td>
<td>+ 1°C</td>
</tr>
</tbody>
</table>

What is the difference between the temperature on 1st January and the temperature on 8th January?

°C

On 22nd January the temperature was 7 degrees lower than on 15th January.

What was the temperature on 22nd January?

°C
A clock shows this time twice a day.

Tick the two digital clocks that show this time.

03:45  02:45  09:45

21:45  14:45

1 mark
Each shape stands for a number.

Total 96

Total 100

Work out the value of each shape.

\[ \text{\triangle} = \underline{\hspace{2cm}} \quad \text{1 mark} \]

\[ \text{\circle} = \underline{\hspace{2cm}} \quad \text{1 mark} \]
Write these numbers in order, starting with the **smallest**.

0.78  0.607  5.6  0.098  4.003

**smallest**
Jacob cuts 4 metres of ribbon into three pieces.

The length of the first piece is 1.28 metres.

The length of the second piece is 1.65 metres.

Work out the length of the third piece.
Here are five angles marked on a grid of squares.

Write the letters of the angles that are **obtuse**.

____________________  1 mark

Write the letters of the angles that are **acute**.

____________________  1 mark
Olivia buys three packets of nuts.

She pays with a £2 coin.

This is her change.

What is the cost of one packet of nuts?
Here is part of the bus timetable from Riverdale to Mott Haven.

<table>
<thead>
<tr>
<th>Location</th>
<th>10:02</th>
<th>10:12</th>
<th>10:31</th>
<th>10:48</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverdale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kingsbridge</td>
<td>10:11</td>
<td>10:21</td>
<td>10:38</td>
<td>10:55</td>
</tr>
<tr>
<td>Fordham</td>
<td>10:28</td>
<td>10:38</td>
<td>10:54</td>
<td>11:11</td>
</tr>
<tr>
<td>Tremont</td>
<td>10:36</td>
<td>10:44</td>
<td>11:00</td>
<td>11:17</td>
</tr>
<tr>
<td>Mott Haven</td>
<td>10:53</td>
<td>11:01</td>
<td>11:17</td>
<td>11:34</td>
</tr>
</tbody>
</table>

How many minutes does it take the 10:31 bus from Riverdale to reach Mott Haven?

[Diagram showing time difference]

1 mark

Mr Evans is at Fordham at 10:30

What is the **earliest** time he can reach Tremont on the bus?

[Diagram showing earliest possible time]

1 mark
10. Emma makes a cuboid using 12 cubes.

Write the letter of the cuboid that has a different volume from Emma’s cuboid.
A toy shop orders 11 boxes of marbles.
Each box contains 6 bags of marbles.
Each bag contains 45 marbles.

How many marbles does the shop order in total?
A triangle is translated from position A to position B.

Complete the sentence.

The triangle has moved [ ] squares to the right

and [ ] squares down.

1 mark
Lara chooses a number less than 20
She divides it by 2 and then adds 6
She then divides this result by 3
Her answer is 4.5

What was the number she started with?
14. Complete each sentence using a number from the list below.

120  240  600  1,440  3,600  6,000

- There are _______ seconds in an hour.  
  1 mark

- There are _______ minutes in a day.  
  1 mark

15. Complete this table by rounding the numbers to the nearest hundred.

<table>
<thead>
<tr>
<th>Rounded to the nearest hundred</th>
</tr>
</thead>
<tbody>
<tr>
<td>20,906</td>
</tr>
<tr>
<td>2,090.6</td>
</tr>
<tr>
<td>209.06</td>
</tr>
</tbody>
</table>

2 marks
6 small bricks have the same mass as 5 large bricks.

The mass of one small brick is 2.5 kg.

What is the mass of one large brick?

Show your method

kg

2 marks
Here are five triangles on a square grid.

Four of the triangles have the same area.

Which triangle has a different area?

1 mark
The diagonals of this quadrilateral cross at right angles.

Tick all the quadrilaterals that have diagonals which cross at right angles.
Circle two numbers that multiply together to equal 1 million.

200  2,000  5,000  50,000

1 mark

Lara had some money.
She spent £1.25 on a drink.
She spent £1.60 on a sandwich.
She has three-quarters of her money left.

How much money did Lara have to start with?

Show your method

£

2 marks
5,542 ÷ 17 = 326

Explain how you can use this fact to find the answer to 18 × 326

1 mark
[END OF TEST]

Please do not write on this page.