Mathematics

Paper 3: reasoning

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

2017 national curriculum tests

Key stage 2
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 maximum number of marks for each question.
1. Write the missing number to make this division correct.

\[ 75 \div \underline{\hspace{2cm}} = 7.5 \]

1 mark

2. A group of friends earns £80 by washing cars.

They share the money \textbf{equally}.

They get £16 each.

How many friends are in the group?

1 mark
Chen uses these digit cards.

5  6  9

She makes a 2-digit number and a 1-digit number.

She multiplies them together.

Her answer is a multiple of 10

What could Chen’s multiplication be?
This graph shows the temperature in °C from 2 am to 3 pm on a cold day.

How many degrees warmer was it at 3 pm than at 3 am?

°C 1 mark

At 6 pm the temperature was 4 degrees lower than at 3 pm.

What was the temperature at 6 pm?

°C 1 mark
The children at Farmfield School are collecting money for charity.

Their target is to collect £360

So far they have collected £57.73

How much more money do they need to reach their target?

£

1 mark
William wants to travel to Paris by train.

He needs to arrive in Paris by **5:30 pm**.

**Circle the latest time that William can leave London.**

<table>
<thead>
<tr>
<th>Leaves London</th>
<th>Arrives Paris</th>
</tr>
</thead>
<tbody>
<tr>
<td>12:01</td>
<td>15:22</td>
</tr>
<tr>
<td>12:25</td>
<td>15:56</td>
</tr>
<tr>
<td>13:31</td>
<td>16:53</td>
</tr>
<tr>
<td>14:01</td>
<td>17:26</td>
</tr>
<tr>
<td>14:31</td>
<td>17:53</td>
</tr>
<tr>
<td>15:31</td>
<td>18:53</td>
</tr>
<tr>
<td>16:01</td>
<td>19:20</td>
</tr>
</tbody>
</table>
Here is a triangle drawn on a coordinate grid.

The triangle is translated **7 right** and **5 up**.

Draw the triangle in its new position.
8 Write three factors of 30 that are not factors of 15

9 Here is the morning timetable for Chen’s class this week.

<table>
<thead>
<tr>
<th>Time</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thu</th>
<th>Fri</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am–10:30 am</td>
<td>Maths</td>
<td>English</td>
<td>Maths</td>
<td>English</td>
<td>Maths</td>
</tr>
<tr>
<td>10:30 am–11:00 am</td>
<td>Break</td>
<td>Break</td>
<td>Break</td>
<td>Break</td>
<td>Break</td>
</tr>
<tr>
<td>11:00 am–12:00 pm</td>
<td>English</td>
<td>Maths</td>
<td>Science</td>
<td>Maths</td>
<td>English</td>
</tr>
</tbody>
</table>

What is the total number of hours for English on this timetable?

[ ] hours
10. A bottle contains 568 millilitres of milk.
   Jack pours out half a litre.

   How much milk is left?

11. A bicycle wheel has a diameter of 64 cm.

   What is the radius of the bicycle wheel?

   cm
Adam buys 6 bags of white balloons.
Chen buys 3 bags of red balloons.

Adam says,

‘I have four times as many balloons as Chen.’

Explain why Adam is correct.
Circle the pentagon with exactly **four acute angles**.
3 pineapples cost the same as 2 mangoes.
One mango costs £1.35

How much does one pineapple cost?

Show your method

£

2 marks
Look at the letters below.

Circle the letter below that has both parallel and perpendicular lines.

A   C   E   L   Z

1 mark
There are 2,400 leaflets in a box.

William and Ally take 450 leaflets each.

Adam and Chen share the rest of the leaflets equally.

How many leaflets does Adam get?
In each box, circle the number that is greater.

1 ½  1.2

1 ¼  1.3

1 5/100  1.4

1 ¾  1.5

2 marks
A square number and a prime number have a total of 22

What are the two numbers?

\[ \square + \square = 22 \]

- square number
- prime number

Dev thinks of a whole number.

He multiplies it by 4

He rounds his answer to the nearest 10

The result is 50

Write all the possible numbers that Dev could have started with.
A square tile measures 20 cm by 20 cm.

A rectangular tile is 3 cm longer and 2 cm narrower than the square tile.

What is the difference in area between the two tiles?

Show your method
The numbers in this sequence increase by the same amount each time.

Write the missing numbers.

\[
\begin{array}{cccc}
\square & 1 & \frac{15}{8} & 2 \frac{1}{4} & \square \\
\end{array}
\]

1 mark

1 mark
In this diagram, the shaded rectangles are all of equal width ($w$).

Calculate the width ($w$) of one shaded rectangle.
Here is a pattern of number pairs.

<table>
<thead>
<tr>
<th>$a$</th>
<th>$b$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
</tr>
<tr>
<td>4</td>
<td>39</td>
</tr>
</tbody>
</table>

Complete the rule for the number pattern.

$$b = \underline{\phantom{10}} \times a - \underline{\phantom{10}}$$

1 mark
Cube A and cuboid B have the same volume.

Calculate the missing length on cuboid B.

Show your method

2 marks