# 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>Day</td>
</tr>
<tr>
<td></td>
<td>Month</td>
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<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>
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.
The original price of this car is £8,999

What is the sale price of the car?

£

1 mark
Which digit is in the **ten thousands** place?

Round 3,576,219 to the **nearest million**.
Dev says,

I had £10
I gave some money away.

Which expression shows how much money Dev has left?

\(a\) is the amount of money, in pounds, that Dev gave away.

Tick one.

\[
\begin{align*}
10 + a & \quad \square \\
10 ÷ a & \quad \square \\
a - 10 & \quad \square \\
a - 10 & \quad \square \\
10 - a & \quad \square \\
a \times 10 & \quad \square
\end{align*}
\]

1 mark
4. Write these masses in order, starting with the **lightest**.

1.25 kg  0.99 kg  1.025 kg  0.009 kg

Write the missing digits to make this addition correct.

\[
\begin{array}{c}
\boxed{2} \quad \boxed{} \\
+ \quad \boxed{} \quad 2
\end{array}
\]

= 200
John buys one toy car and one pack of stickers.

£1.49

£1.64

He pays with a £10 note.

How much change does John get?

Show your method

£

2 marks
This picture shows the masses of eight kittens.

305 g  375 g  310 g  255 g
275 g  410 g  360 g  345 g

What is the difference in mass between the heaviest kitten and the lightest kitten?

<table>
<thead>
<tr>
<th>Mass in g</th>
<th>Number of kittens</th>
</tr>
</thead>
<tbody>
<tr>
<td>250–299</td>
<td></td>
</tr>
<tr>
<td>300–349</td>
<td></td>
</tr>
<tr>
<td>350–399</td>
<td></td>
</tr>
<tr>
<td>400–449</td>
<td>1</td>
</tr>
</tbody>
</table>

The masses of the kittens are to be put in four groups.

Write the missing numbers in the table.

One has been done for you.
8. Ken is playing a game. He has 4,289 points. Then he scores another 355 points. Ken's target is 6,000 points.

How many more points does Ken need to reach his target?

9. This pictogram shows the number of satellites above the Earth in 2016.

How many satellites were above the Earth in 2016?
On the grid there are three points joined by two lines.

Lara plots another point on the grid at \((-1, 2)\).

She joins the points to make a quadrilateral.

Complete Lara’s quadrilateral on the grid.
Use a ruler.

Then Lara translates the quadrilateral 4 squares to the right.

Draw the quadrilateral in its new position on the grid.
Here are five numbers.

\[
\begin{array}{cccc}
2 & 3 & 4 & 5 & 6
\end{array}
\]

Write each number on the correct cards.

The number 2 has been written on the correct cards for you.

<table>
<thead>
<tr>
<th>Prime numbers</th>
<th>Factors of 12</th>
<th>Factors of 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

2 marks

Amina’s bed is 190 cm in length and 91 cm in width.

She is making a one-tenth scale model of the bed.

What are the length and width of Amina’s model?

\[
\begin{align*}
\text{length} &= \underline{\phantom{0}} \text{ cm} \\
\text{width} &= \underline{\phantom{0}} \text{ cm}
\end{align*}
\]

1 mark
Kirsty says,

When you double the size of an acute angle, you always get an obtuse angle.

Explain why Kirsty is not correct.
14. How many days are there in September, October and November altogether?

(days)

1 mark

15. The International Space Station orbits the Earth at a height of 250 miles.

What is the height of the International Space Station in **kilometres**?

Use 8 kilometres equals 5 miles.

(km)

1 mark
Jack buys $\frac{1}{2}$ kg of potatoes and $\frac{1}{2}$ kg of carrots.

How much change does he get from £5?

Show your method
17

\[ x + 2y = 20 \]

\(x\) and \(y\) are whole numbers \textbf{less than 10}

What could \(x\) and \(y\) be?

\[ x = \]

\[ y = \]

1 mark

18

Tick the fractions \textbf{less than} \(\frac{5}{8}\)

\(\frac{1}{2}\) \[
\]

\(\frac{2}{8}\) \[
\]

\(\frac{3}{4}\) \[
\]

\(\frac{7}{16}\) \[
\]

\(\frac{24}{32}\) \[
\]

2 marks
Layla makes jewellery to sell at a school fair.

Each bracelet has 53 beads.
She makes 68 bracelets.

Each necklace has 105 beads.
She makes 34 necklaces.

How many beads does Layla use altogether?
Adam is making booklets.

Each booklet must have **34** sheets of paper.

He has **2** packets of paper.

There are **500** sheets of paper in each packet.

How many complete booklets can Adam make from **2** packets of paper?

Show your method
**ABDE** is a rectangle on coordinate axes.

The sides of the rectangle are parallel to the axes.

Point **C** is the centre of the rectangle.

What are the coordinates of **B** and **D**?

B is \(( , )\)

D is \(( , )\)
Six identical right-angled triangles are arranged to make a rectangle.

Not actual size

Calculate the **length** of the rectangle.

\[
\text{cm}
\]

1 mark
The distance from point $P$ to point $R$ is 800 metres.

The distance from point $P$ to point $Q$ is **4 times** the distance from point $Q$ to point $R$.

Olivia says,

> It is 600 metres from point $P$ to point $Q$.

Explain why Olivia is **not** correct.
[END OF TEST]

Please do not write on this page.