# Mathematics tests

## Paper 2

**Calculator allowed**

<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>School name</td>
<td></td>
</tr>
<tr>
<td>DfE number</td>
<td></td>
</tr>
</tbody>
</table>
Please do not write on this page.
Instructions

You **may** use a calculator to answer any questions in this test.

Work as quickly and as carefully as you can.

You have **30 minutes** for this test.

If you cannot do one of the questions, **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**.

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**Follow the instructions for each question carefully.**

This shows where you need to put the answer.

If you need to do working out, you can use any space on a page.

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**Some questions have an answer box like this:**

Show your method

For these questions you may get a mark for showing your method.
$x$ stands for an **odd** number.

$y$ stands for an **even** number.

Look at the expressions below.

For each expression, tick to show if it is odd or even.

The first one is done for you.

<table>
<thead>
<tr>
<th>Expression</th>
<th>Odd</th>
<th>Even</th>
</tr>
</thead>
<tbody>
<tr>
<td>$x + y$</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>$x + 2y$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$2(x + y)$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$xy$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$x^2 + y$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 marks
In a zoo, the adult polar bear weighs three times more than the baby elephant.

Together they weigh 700 kilograms.

How much does the polar bear weigh?

Show your method

kg

2 marks
The diagram shows an isosceles triangle and a square on a straight line.

Calculate angle $\alpha$. 

Show your method.
Here are three scatter graphs showing the heights of people and the cost of clothes.

Chen says,

‘The taller you are, the more your clothes cost.’

Megan says,

‘The shorter you are, the more your clothes cost.’

Alfie says,

‘There is no relationship between your height and what your clothes cost.’

Write the letter of each scatter graph that shows what each person says.

Chen  _____  Megan  _____  Alfie  _____  

1 mark
Chen chooses a prime number.

He multiplies it by 10 and then rounds it to the nearest hundred.

His answer is 400

Write all the possible prime numbers Chen could have chosen.
Alfie asks some boys and girls about their favourite hobby.

He shows the results on a graph.

The graph shows that 44% of boys chose sport.

Estimate the percentage of girls who chose sport.

120 boys chose reading.

Estimate the number of boys who chose cinema.
Megan goes on a walking holiday for five days.

The table shows how far she walked on the first four days.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
</tr>
</thead>
<tbody>
<tr>
<td>14km</td>
<td>23km</td>
<td>13km</td>
<td>13km</td>
</tr>
</tbody>
</table>

Megan says,

‘My average for the first four days is more than 15km.’

Explain why Megan is **correct**.

Friday is her last day.

She wants to increase her average to **17km**

How many kilometres must she walk on Friday?

Show your method
Every second, 300cm\(^3\) of water comes out of a tap into a cuboid tank.

The base of the tank is 40cm by 40cm

The height is 12cm

How many seconds does it take to fill the tank?

Show your method

seconds

2 marks
\( y \) stands for a number.

\[ y \times y \times y = 5 \]

The most accurate value for \( y \) to **one decimal place** is 1.7 because

\[ 1.7 \times 1.7 \times 1.7 = 4.913 \]

\( k \) stands for a number.

\[ k \times k \times k = 10 \]

Find the most accurate value for \( k \) correct to **one decimal place**.

Show your method

\[ k = \]

2 marks
A box of sticky labels costs £33.50

There are 150 sheets of labels in the box.

There are 14 labels on each sheet.

What is the cost of one label *to the nearest penny*?
A bag contains 35 red counters only.
Chen adds green counters to the bag.
The probability of picking a green counter is now 0.3

How many green counters did Chen add?
Here is a trapezium with a height of 10 centimetres. The parallel sides are 5.5cm long and 10.5cm long. Find the area of the trapezium.

The parallel sides are 5.5cm long and 10.5cm long.

Find the area of the trapezium.

Show your method

2 marks