Mathematics test

Paper 1

Calculator not allowed

Please read this page, but do not open your booklet until your teacher tells you to start. Write your name and the name of your school in the spaces below.

First name

Last name

School

Remember

- The test is 1 hour long.
- You must not use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler, a pair of compasses, tracing paper and mirror (optional).
- This test starts with easier questions.
- Try to answer all the questions.
- Write all your answers and working on the test paper – do not use any rough paper. Marks may be awarded for working.
- Check your work carefully.
- Ask your teacher if you are not sure what to do.

For marker's use only

Total marks
Instructions

Answers
This means write down your answer or show your working and write down your answer.

Calculators
You must not use a calculator to answer any question in this test.
1. (a) Jeff asked 30 pupils if they travel to school by bus.

20 pupils said yes.

10 pupils said no.

He started to draw a pictogram using the key represents 5 pupils.

Complete the pictogram to show Jeff’s results.

(b) Sue asked 20 pupils which subject they like best.

She drew this pictogram but forgot to write the key.

How many pupils does represent?

........... pupils
2. Write in the boxes what the missing numbers could be.

\[ \square + \square + \square = 15 \]  
1 mark

\[ \square \times \square = 15 \]  
1 mark

\[ \square \div \square = 15 \]  
1 mark

\[ \square \times \square + \square = 15 \]  
1 mark
3. (a) Look at this scale.

![Scale Diagram]

What value is the arrow pointing to on the scale?

……………….

1 mark

(b) Here is a different scale.

Draw an arrow (↓) so that it shows the same value as the arrow in part (a).
4. Look at these prices.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruler</td>
<td>30p</td>
</tr>
<tr>
<td>Pencil</td>
<td>15p</td>
</tr>
<tr>
<td>Blue pen</td>
<td>35p</td>
</tr>
<tr>
<td>Green pen</td>
<td>40p</td>
</tr>
<tr>
<td>Eraser</td>
<td>20p</td>
</tr>
</tbody>
</table>

(a) Use the prices to fill in the gaps below.

The total cost of two rulers and one pencil.

The total cost of three blue pens.

The total cost of one blue pen and ____________

1 mark

1 mark

1 mark
(b) There are many **different ways** to make the total cost **60p**.

Use the prices to fill in the gaps below.

One way is done for you.

- The total cost of **two rulers**
- The total cost of ........................................ 1 mark
- The total cost of ........................................ 1 mark
- The total cost of ........................................ 1 mark
5. (a) My wall clock shows this time:

![Clock Image]

Which two of the digital clocks below could be showing the same time as my wall clock?

Tick (✓) the correct two.

03:00

13:00

14:00

15:00

16:00

1 mark
(b) Early in the **morning** my wall clock shows this time:

![Clock showing morning time]

My digital clock shows the same time as my wall clock.
Write what time my digital clock is showing.

![Digital clock]

1 mark

(c) In the **afternoon** my wall clock shows this time:

![Clock showing afternoon time]

My digital clock is a 24 hour clock.
Now what time is my digital clock showing?

![Digital clock]

1 mark
6. (a) What number should you add to 28 to make 100?

\[\text{Solution:} \quad 100 - 28 = 72\]

(b) What number should you subtract from 100 to make 78?

\[\text{Solution:} \quad 100 - 78 = 22\]

(c) Work out

\[48 + 49 = \quad \text{Solution:} \quad 97\]

\[78 \div 3 = \quad \text{Solution:} \quad 26\]

\[1048 + 208 = \quad \text{Solution:} \quad 1256\]

\[4828 - 480 = \quad \text{Solution:} \quad 4348\]
7. (a) The number chain below is part of a **doubling** number chain.

Fill in the two missing numbers.

\[
\ldots \quad 40 \quad 80 \quad 160 \quad \ldots
\]

1 mark

(b) The number chain below is part of a **halving** number chain.

Fill in the two missing numbers.

\[
40 \quad 20 \quad 10 \quad \ldots \quad \ldots
\]

1 mark
8. A teacher has five number cards.

She says:

‘I am going to take a card at random.

Each card shows a **different** positive whole number.

It is **certain** that the card will show a number less than 10

It is **impossible** that the card will show an even number.’

What numbers are on the cards?
9. When the wind blows it feels colder.
The stronger the wind, the colder it feels.

Fill in the gaps in the table.
The first row is done for you.

<table>
<thead>
<tr>
<th>Wind strength</th>
<th>Temperature out of the wind (°C)</th>
<th>How much <strong>colder</strong> it feels in the wind (°C)</th>
<th>Temperature it feels in the wind (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate breeze</td>
<td>5</td>
<td>7 degrees colder</td>
<td>-2</td>
</tr>
<tr>
<td>Fresh breeze</td>
<td>-8</td>
<td>11 degrees colder</td>
<td>....</td>
</tr>
<tr>
<td>Strong breeze</td>
<td>-4</td>
<td>.... degrees colder</td>
<td>-20</td>
</tr>
<tr>
<td>Gale</td>
<td>....</td>
<td>23 degrees colder</td>
<td>-45</td>
</tr>
</tbody>
</table>
10. Some pupils throw two fair six-sided dice. Each dice is numbered 1 to 6. One dice is blue. The other dice is red.

Anna’s dice show **blue 5, red 3**

Her total score is **8**

The cross on the grid shows her throw.

(a) Carl’s total score is **6**

What numbers could Carl’s dice show?

Put crosses on the grid to show all the different pairs of numbers Carl’s dice could show.
(b) The pupils play a game.

**Winning rule:** Win a point if the number on the **blue** dice is the same as the number on the **red** dice.

Put crosses on the grid to show all the different winning throws.

![Grid with crosses showing winning throws.](image)

(c) The pupils play a different game.

The grid shows all the different winning throws.

![Grid showing different winning throws.](image)

Complete the sentence below to show the winning rule.

**Winning rule:** Win a point if the number on the **blue** dice is...
11. Look at the hexagon and the triangle.

(a) Do the hexagon and triangle have the same area?
Tick (√) Yes or No.

[ ] Yes  [ ] No

Explain your answer.

(b) Do the hexagon and triangle have the same perimeter?
Tick (√) Yes or No.

[ ] Yes  [ ] No

Explain your answer.
12. There are two small tins and one big tin on these scales.

The two small tins each have the same mass.

The mass of the big tin is \(2.6\text{kg}\).

What is the mass of one small tin?

Show your working.

\[
\text{kg} 
\]

2 marks
13. I have a square grid and two rectangles.

I make a pattern with the grid and the two rectangles:

The pattern has **no** lines of symmetry.

(a) Put both rectangles on the grid to make a pattern with **two** lines of symmetry.

You must **shade** the rectangles.
(b) Put both rectangles on the grid to make a pattern with only one line of symmetry.
You must shade the rectangles.

(c) Put both rectangles on the grid to make a pattern with rotation symmetry of order 2
You must shade the rectangles.

14. Simplify these expressions.

\[ 5k + 7 + 3k = \]  

\[ k + 1 + k + 4 = \]
15. A car park shows this sign.

**Car Parking**

**70p**

Pay using any of these coins:

- 10p
- 20p
- 50p

No change given

Complete the table to show all the different ways of paying exactly 70p.

<table>
<thead>
<tr>
<th>Number of 10p coins</th>
<th>Number of 20p coins</th>
<th>Number of 50p coins</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

2 marks
16. Fill in the missing numbers.

\[
\frac{1}{2} \text{ of } 20 = \frac{1}{4} \text{ of } \ldots \\
\frac{3}{4} \text{ of } 100 = \frac{1}{2} \text{ of } \ldots \\
\frac{1}{3} \text{ of } 60 = \frac{2}{3} \text{ of } \ldots \\
\]

1 mark

1 mark

1 mark
Moving C

17. On this square grid, A and B must not move.

When C is at (6, 6), triangle ABC is **isosceles**.

(a) C moves so that triangle ABC is still **isosceles**.

Where could C have moved to?
Write the coordinates of its new position.

(b) Then C moves so that triangle ABC is **isosceles and right-angled**.

Where could C have moved to?
Write the coordinates of its new position.

( , )

1 mark

( , )

1 mark
18. (a) There are four people in Sita’s family. Their shoe sizes are 4, 5, 7 and 10.

What is the median shoe size in Sita’s family?

1 mark

(b) There are three people in John’s family. The range of their shoe sizes is 4.

Two people in the family wear shoe size 6.

John’s shoe size is not 6 and it is not 10.

What is John’s shoe size?

1 mark
19. **Use compasses** to construct a triangle that has sides **8cm, 6cm** and **7cm**.

Leave in your construction lines.

One side of the triangle is drawn for you.
20. (a) I pay £16.20 to travel to work each week.

I work for 45 weeks each year.

How much do I pay to travel to work each year?
Show your working.

\[ £ \]

(b) I could buy one season ticket that would let me travel for all 45 weeks.

It would cost £630

How much is that per week?

\[ £ \]
21. Solve these equations.

\[ 8k - 1 = 15 \]

\[ k = \ldots \ldots \ldots \ldots \ \text{1 mark} \]

\[ 2m + 5 = 10 \]

\[ m = \ldots \ldots \ldots \ldots \ \text{1 mark} \]
END OF TEST