Year 9 mathematics test

Paper 2
Calculator allowed

First name

Last name

Class

Date

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

Remember:
- The test is 1 hour long.
- You may use a calculator for any question in this test.
- You will need: pen, pencil, rubber, ruler and a calculator.
- Some formulae you might need are on page 2.
- 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 marking use only

Total marks
Instructions

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

Calculators
You may use a calculator to answer any question in this test.

Formulae
You might need to use these formulae

**Trapezium**

Area = \( \frac{1}{2}(a + b)h \)

**Prism**

Volume = area of cross-section \( \times \) length
1. Write the missing numbers.

\[ 962 + \_\_\_\_\_\_ = 1898 \]  
1 mark

\[ \_\_\_\_\_\_ - 403 = 982 \]  
1 mark

\[ 51 \times \_\_\_\_\_\_ = 2397 \]  
1 mark

\[ \_\_\_\_\_\_ \div 23 = 828 \]  
1 mark
2. A shop charges to deliver food to people’s homes.
   The cost depends on the day of delivery.

<table>
<thead>
<tr>
<th>Day of delivery</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday or Wednesday</td>
<td>£3.99</td>
</tr>
<tr>
<td>Monday or Thursday</td>
<td>£4.99</td>
</tr>
<tr>
<td>Friday or Saturday</td>
<td>£5.99</td>
</tr>
<tr>
<td>Sunday</td>
<td>£6.99</td>
</tr>
</tbody>
</table>

### July 2008

<table>
<thead>
<tr>
<th>Su</th>
<th>M</th>
<th>Tu</th>
<th>W</th>
<th>Th</th>
<th>F</th>
<th>Sa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>20</td>
<td>21</td>
<td>22</td>
<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
</tr>
<tr>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) What is the cost of delivery on **18 July 2008**?

£

(b) Mrs Jones wants a delivery **every Thursday** in **July 2008**.
   How much will that cost altogether?

£

(c) What is the cost of delivery on **5 August 2008**?

£
3. Write multiples to make these additions correct.

\[
\begin{align*}
12 \quad \text{multiple of 3} & \quad 12 \quad \text{multiple of 4} \quad 12 \quad \text{multiple of 5} \\
+ \quad 12 \quad \text{multiple of 3} & \quad 12 \quad \text{multiple of 4} \\
\end{align*}
\]
4. Here is a shape on a square grid.

Here are some statements about the shape.
For each statement tick (✓) True or False.

The shape has no right angles. [ ] True [ ] False 2 marks

The shape has four obtuse angles. [ ] True [ ] False

The shape has no lines of symmetry. [ ] True [ ] False

The shape has two pairs of parallel sides. [ ] True [ ] False
5. Tom has a fair spinner with 8 equal sections. He is going to spin the pointer.

Draw lines to show how likely the following are. One is done for you.

- He will spin the **number 3** [certain]
- He will spin the **number 5** [likely]
- He will spin the **number 6** [even chance]
- He will spin a **number less than 7** [unlikely]

2 marks
6. Two websites sell the same type of radio.

<table>
<thead>
<tr>
<th></th>
<th>Website A</th>
<th>Website B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of radio</td>
<td>£79.99</td>
<td>£76.76</td>
</tr>
<tr>
<td>Cost of postage</td>
<td>£3.49</td>
<td>£6.79</td>
</tr>
</tbody>
</table>

Sunil is going to buy the radio from one of the websites. He also has to pay for postage.

Which website is **cheaper** and by how much?

Website _______ is cheaper by ____________

2 marks

1 mark
7. The graph shows information about 13 different types of eel that live in the sea.

The graph represents the following:

- The longest the eel can grow (cm)
- The deepest the eel can swim (m)

Use the graph to answer these questions.

(a) One type of eel is called a goldentail moray.
   The longest it can grow is 70 cm.
   The deepest it can swim is 60 m.
   Put a ring around the point on the graph that represents this eel.

(b) How many of these different types of eel can swim deeper than 100 m?
8. A shop sells school uniform.

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two shirts and one jumper</td>
<td>£29</td>
</tr>
<tr>
<td>One shirt and one jumper</td>
<td>£21</td>
</tr>
</tbody>
</table>

How much does one jumper cost?
Complete the missing information.

In **1980**, only three television channels were available. The most popular was ________________.

1 mark

In **2005**, the biggest percentage share is for ________________.

1 mark

The percentage share for ________________ remained **almost the same** at about __________% each year.

1 mark
10. **A boat can be hired for children’s parties.**

   **Have your child’s party on our boat**

   The formula below shows the cost.

   \[
   \text{Cost} = £13.50 \times \text{the number of children} + £23
   \]

   (a) What is the cost of a party for 8 **children**?

   \[
   £
   \]

   1 mark

   (b) A different children’s party cost **£225.50**

   How many children were at the party?

   2 marks
11. I make a sequence of shapes using grey and white tiles.

![Shapes](image)

The total number of tiles in shape number \( n \) is \( 4n + 4 \)

(a) I remove half the tiles to make the sequence of shapes below.

![Shapes](image)

Complete the sentence.

The total number of tiles in shape number \( n \) is ______

(b) Then I remove half the tiles again.

![Shapes](image)

Complete the sentence.

The total number of tiles in shape number \( n \) is ______

1 mark
The table shows information about six types of bird that can be seen in Britain. The birds are listed in order of size from biggest to smallest.

<table>
<thead>
<tr>
<th>Name of bird</th>
<th>Size of bird</th>
<th>When it can be seen</th>
<th>Average egg length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Summer</td>
<td>Winter</td>
</tr>
<tr>
<td>Mistle Thrush</td>
<td>Biggest</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Fieldfare</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Blackbird</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Ring Ouzel</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Song Thrush</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>Redwing</td>
<td>Smallest</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>

Use the table to answer these questions.

(a) What is the name of the **smallest** bird that can be seen in **summer**?
(b) Fred says:

In this table, the **bigger birds always have bigger egg lengths** than the smaller birds.

Is he correct?

☐ Yes  ☐ No

Explain your answer.
13. People pay to visit a garden.

<table>
<thead>
<tr>
<th>Tickets:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 16 and over</td>
<td>£3.60</td>
</tr>
<tr>
<td>Under 16</td>
<td>£2.25</td>
</tr>
</tbody>
</table>

145 people pay.

39 of them are under 16

How much ticket money is paid altogether?

£
14. The diagram shows a prism.

The centimetre square grid below shows part of the net for the prism.

Complete the net accurately.
15. (a) Dave says:

30 is the **only** multiple of 3 that ends in a zero.

Is he correct?

- [ ] Yes  
- [ ] No

Explain your answer.

(b) Ali says:

30 is the **only** number that is divisible by both 5 and 2

Is she correct?

- [ ] Yes  
- [ ] No

Explain your answer.
16. Each shape on this square grid has angles that are 45°, 90° or 135°

Complete the table.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angles</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>135°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. (a) Write a number that is bigger than \( \frac{5}{3} \) but smaller than 6

(b) Now write a number that is bigger than 5.6 but smaller than \( \frac{5}{3} \)
18. The shaded rectangle is **twice as long** as it is wide.

The **perimeter** of the rectangle is **30cm**.

What is the **area** of the rectangle?

_________ cm²

2 marks
19. The diagram shows a kite. The side lengths are in centimetres.

(a) When \( n = 9 \), what is the perimeter of the kite?

\[ \text{cm} \]

1 mark

(b) When the perimeter of the kite is \( 100 \text{cm} \), what is the value of \( n \)?

\[ n = \] 2 marks
20. I have a fair six-sided dice, numbered 4, 9, 12, 16, 20 and 24. I am going to roll the dice.

(a) What is the probability of rolling a multiple of 4?

(b) What is the probability of rolling a square number?
21. The price of a coat is £65
   In a sale the price is **reduced** by 15%
   What is the sale price of the coat?

22. A cuboid has length, $l$, width, $w$, and height, $h$
   The distance between opposite corners is $d$

   Look at the formula.

   \[ d^2 = l^2 + w^2 + h^2 \]

   Use the formula to find the value of $d$ when $l = 6$, $w = 2$ and $h = 3$

   \[ d = \]
23. (a) Is it possible to draw a triangle with **angles** 150°, 10° and 10°?

- [ ] Yes
- [ ] No

Explain your answer.

(b) Is it possible to draw a triangle with **sides** 150cm, 10cm and 10cm?

- [ ] Yes
- [ ] No

Explain your answer.
24. The pie chart shows how pupils in class 9A travelled to school one morning.

5 pupils in class 9A walked to school.

Work out how many pupils in class 9A travelled by bus.

_________ pupils
25. (a) Every day a machine makes 500 000 drawing pins and puts them into boxes. The machine needs 150 drawing pins to fill a box. How many boxes can be filled with the 500 000 drawing pins?

\[ \text{boxes} \]

1 mark

(b) Each drawing pin is made from 0.23g of metal. How many drawing pins can be made from 1kg of metal?

\[ \text{drawing pins} \]

2 marks
26. Here are some exchange rates.

<table>
<thead>
<tr>
<th>£1</th>
<th>2.03 American dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>£1</td>
<td>2.15 Canadian dollars</td>
</tr>
</tbody>
</table>

Use the exchange rates to answer this question.

How many more Canadian dollars than American dollars would you get for £250?

dollars

2 marks