INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer all the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do not write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [ ] at the end of each question or part question.
- The quality of written communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is 100.
- This document consists of 24 pages. Any blank pages are indicated.

WARNING

No calculator can be used for this paper

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

Volume of prism = (area of cross-section) \( \times \) length
Answer all the questions.

1 Work out.

(a) (i) $34 \times 100$ .......................................................... [1]

(ii) $456 + 572$ .......................................................... [1]

(iii) $57.6 - 26.2$ .......................................................... [1]

(iv) $72.6 \div 3$ .......................................................... [1]

(v) $-5 + 2$ .......................................................... [1]

(b) $40\%$ of 840 .......................................................... [2]
Vladimir asked 70 people what was their favourite sport from the Winter Olympics. He recorded his results on the bar chart below.

(a) How many people answered Ice skating? .......................................................... [1]

(b) The rest of the 70 people answered Skiing. Show this on the bar chart. [2]

(c) What was the most popular sport? .......................................................... [1]

(d) How many more people answered Curling than Ice skating? .......................................................... [2]
3 Points A and C are plotted on a coordinate grid.

(a) Write down the coordinates of point A.

(a) (.........................., ..........................) [1]

(b) On the grid, plot point B at (-4, -3).

[1]

(c) What is the mathematical name of triangle ABC?

(c) ....................................................... [1]

4 (a) Write $\frac{4}{5}$ as a decimal.

(a) ....................................................... [1]

(b) Write 0.06 as a percentage.

(b) ....................................................... % [1]
5 (a) Measure the size of angle $x$. 

\[ x \]

(a) \[................................. \,^\circ \] [1]

(b) What is the mathematical name of this type of angle?

(b) \[................................. \] [1]

(c) Work out the angles below. Give a reason for each answer.

(i) 

Not to scale

\[ y \quad 75^\circ \]

Angle $y$ is \[.............^\circ\] because \[..........................................................\]

.......................................................... [2]

(ii) 

Not to scale

\[ z \quad 42^\circ \]

Angle $z$ is \[.............^\circ\] because \[..........................................................\]

.......................................................... [2]
Ten cards numbered 1 to 10 are placed face down. One card is chosen without looking.

<table>
<thead>
<tr>
<th>evens</th>
<th>unlikely</th>
<th>impossible</th>
</tr>
</thead>
<tbody>
<tr>
<td>certain</td>
<td>likely</td>
<td></td>
</tr>
</tbody>
</table>

Choose a word from the box above to complete each of the following sentences.

(a) It is ................................................ that it will have a number less than 4 on it. [1]

(b) It is ................................................ that it will have a number less than 12 on it. [1]

7 (a) The temperature in George's garden at 3 pm was 8°C.
By 4 am the temperature had fallen 14°C.
What was the temperature at 4 am?

(a) .................................................... °C [1]

(b) One night the temperature in Helsinki was 2°C.
In Whitehorse the temperature was -9°C.
How much warmer was Helsinki than Whitehorse?

(b) .................................................... °C [1]
8 Louise has to mark 3 books, A, B and C.

Complete the table to show the order in which she could mark the books.

<table>
<thead>
<tr>
<th>First</th>
<th>Second</th>
<th>Third</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

9 (a) Solve.

(i) \( w + 7 = 32 \)

\[(a)(i) \ w = \ldots \] [1]

(ii) \( 5x = 45 \)

\[(ii) \ x = \ldots \] [1]

(b) Simplify.

\[5r + 7s + 3r - 10s\]

\[(b) \ldots \] [2]
10 (a) The table shows part of a bus timetable from Owl Town to Shropton.

<table>
<thead>
<tr>
<th></th>
<th>0840</th>
<th>0855</th>
<th>0910</th>
<th>0925</th>
<th>0940</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owl Town</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leeville</td>
<td>0848</td>
<td>0903</td>
<td>0917</td>
<td>0936</td>
<td>0949</td>
</tr>
<tr>
<td>Library</td>
<td>0858</td>
<td>0912</td>
<td>0927</td>
<td>0948</td>
<td>0959</td>
</tr>
<tr>
<td>Rose Way</td>
<td>0904</td>
<td>0918</td>
<td>0933</td>
<td>0954</td>
<td>1006</td>
</tr>
<tr>
<td>Station</td>
<td>0919</td>
<td>0932</td>
<td>0947</td>
<td>1008</td>
<td>1020</td>
</tr>
<tr>
<td>Shropton</td>
<td>0926</td>
<td>0939</td>
<td>0955</td>
<td>1015</td>
<td>1028</td>
</tr>
</tbody>
</table>

(i) How long does the 0910 bus from Owl Town take to travel to Rose Way?

(a)(i) ............................................ minutes [1]

(ii) Jo has to be at the station by 0954.

What is the latest time she can catch a bus from Leeville?

(ii) ............................................. [1]

(b) (i) Elise arrives in Shropton at 0926.

It takes her 15 minutes to walk to work.

What time does she arrive at work?

(b)(i) ............................................. [1]

(ii) Elise starts work at 0950 and finishes at 1430.

How long is Elise at work?

(ii) ............... hours ............... minutes [2]
11 (a) Sam travelled 240 km in France.

He uses the following formula to convert kilometres to miles.

Divide by 8 then multiply by 5.

How many miles did Sam travel?

(a) ................................................ miles [2]

(b) Work out the value of $4a - 6b$ when $a = 12$ and $b = 3$.

(b) .......................................................... [2]
Roger sees the same holiday advertised by two different travel companies.

<table>
<thead>
<tr>
<th>OCR Travel</th>
<th>Sail Away</th>
</tr>
</thead>
<tbody>
<tr>
<td>£900 per person</td>
<td>£960 per person</td>
</tr>
<tr>
<td>Book online save 10%</td>
<td>Book online save 5%</td>
</tr>
<tr>
<td>Car parking £80 per car</td>
<td>Free Parking</td>
</tr>
</tbody>
</table>

Roger is going to book this holiday online for himself and his wife.

They will travel together by car. Which is the cheaper company for their holiday and by how much?

...... is cheaper by .................. [5]
13 (a) An isosceles triangle is drawn below.

Not to scale

Work out the perimeter of the triangle.

(a) .................................................... cm [2]

(b) A square and a rectangle are drawn below.

The width, \(w\) cm, of the rectangle is the same as the length of a side of the square.

Work out the area of the rectangle.

(b) ................................................... cm\(^2\) [3]
Jim asked 180 people to name their favourite fruit. He started to draw a pie chart to show the results.

Here are the rest of Jim’s results.

<table>
<thead>
<tr>
<th>Favourite fruit</th>
<th>Number of people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pear</td>
<td>16</td>
</tr>
<tr>
<td>Grapes</td>
<td>30</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
</tr>
</tbody>
</table>

(a) Complete the pie chart.

(b) How many people chose Banana as their favourite fruit?

(b) .......................................................... [1]
Leo has a bag containing red, yellow, blue and green counters. Leo thinks he knows the probability of choosing a counter of each colour from the bag without looking. He writes the probabilities in this table.

<table>
<thead>
<tr>
<th>Red</th>
<th>Yellow</th>
<th>Blue</th>
<th>Green</th>
</tr>
</thead>
<tbody>
<tr>
<td>(\frac{1}{12})</td>
<td>(\frac{1}{4})</td>
<td>(\frac{1}{3})</td>
<td>(\frac{5}{12})</td>
</tr>
</tbody>
</table>

Explain how you know Leo must have made a mistake in his table.
16 (a) Here is a circle.

Write down the mathematical name of

(i) A, .......................................................... [1]

(ii) B, .......................................................... [1]

(iii) C. .......................................................... [1]

(b) The radius of another circle is 4 cm.

Calculate the area of this circle, leaving your answer in terms of \( \pi \).

(b) ................................................... cm\(^2\) [2]
17 (a) Multiply out the brackets.

\[ 10(2x + 5) \]

(b) Solve.

\[ 5x - 7 = 3x + 16 \]

(a) ......................................................... [1]

(b) \( x = \) ......................................................... [3]
The diagram shows two triangles on a square grid.

(a) Translate triangle $T$ by the vector $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$. Label the image $P$. [2]

(b) Rotate triangle $T$ through $180^\circ$ about centre $(-1, 0)$. Label the image $R$. [2]

(c) Describe the single transformation that maps triangle $T$ onto triangle $A$. [3]
The graph shows the journey of a train from London to Peterborough. On the journey the train makes a stop at Stevenage.

Use the graph to answer these questions.

(a) What time does the train arrive at Stevenage?

(a) .................................................. [1]

(b) Work out the average speed of the train between Stevenage and Peterborough. Give your answer in miles per hour.

(b) .................................................. mph [2]
Here are the first four terms of a sequence.

33  27  21  15

What is the next term in the sequence?
Explain how you worked it out.

........................ because ..............................................................
............................................................................................................. [2]

Here are the first four terms of another sequence.

12  19  26  33

Write an expression for the \( n \)th term of the sequence.

(b) .......................................................... [2]
The table is part of the final medal table from the 2014 Winter Olympics.

Use the information below to complete the table.

- Norway won twice as many bronze medals as silver medals.
- The medals won by Italy were in the ratio Silver : Bronze = 1 : 3.

<table>
<thead>
<tr>
<th>Country</th>
<th>Gold</th>
<th>Silver</th>
<th>Bronze</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norway</td>
<td>11</td>
<td></td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>Italy</td>
<td>0</td>
<td></td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>
A net of a cuboid is drawn on a one-centimetre square grid.

Work out the volume of the cuboid.
Give the units of your answer.
23 Mustafa carries out a consumer survey in his town.

(a) He wants to find out the ages of the people in his survey.

Criticise each of the following two questions.

(i) How old are you?
Write your age in the box. Age = 

...........................................................................................................................................
...........................................................................................................................................
...........................................................................................................................................
........................................................................................................................................... [1]

(ii) What is your age?
Put a tick in the correct box.

☐ 0–20  ☐ 20–40  ☐ 40–60  ☐ over 60

...........................................................................................................................................
...........................................................................................................................................
........................................................................................................................................... [1]

(b) Mustafa wants to find out how many pints of milk each household buys in a week.

Write a question he could use and include suitable option boxes.
Use 20 pints as the maximum number in a week. [2]
In the table there are five statements.

The statements are true for some numbers and false for other numbers.

For each statement give an example for which it is true and an example for which it is false. Choose numbers which are between 0 and 20. The first one has been done for you.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prime numbers are odd.</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>The square of a number is larger than the number.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The highest common factor (HCF) of <strong>two numbers</strong> is smaller than both numbers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A number has an even number of factors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The reciprocal of a number is smaller than the number.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

END OF QUESTION PAPER