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.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is 60.
- This document consists of 16 pages. Any blank pages are indicated.
Area of trapezium = \( \frac{1}{2} (a + b)h \)

Volume of prism = (area of cross-section) x length
1  (a) Work out.

\[ 142 + 65 - 96 \]

(a) \[ \underline{ \phantom{000} } \] [2]

(b) Work out.

\[ \frac{1}{5} \text{ of } 25 \]

(b) \[ \underline{ \phantom{00} } \] [1]

(c) Work out.

\[ 10\% \text{ of } £710 \]

(c) £ \[ \underline{ \phantom{000} } \] [1]

(d) Write \( \frac{25}{40} \) as a fraction in its simplest form.

(d) \[ \underline{ \phantom{000} } \] [1]

(e) Complete this table.
   The first row has been done for you.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Decimal</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{1}{4} )</td>
<td>= 0.25</td>
<td>= 25%</td>
</tr>
<tr>
<td>( \frac{2}{5} )</td>
<td>=</td>
<td>= 40%</td>
</tr>
<tr>
<td></td>
<td>= 0.07</td>
<td>= 7%</td>
</tr>
</tbody>
</table>

[2]
This circle has centre O.
Complete the three labels for parts of the circle.
Use words from this list.

Diameter        Radius        Circumference
Semicircle      Segment       Arc

[3]
3  (a) Complete Jenny’s shopping bill.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crisps at £1.45 a packet</td>
<td>4 packets</td>
<td>£ ________</td>
</tr>
<tr>
<td>Bottles of Cola at £2.30 a bottle</td>
<td>3 bottles</td>
<td>£ ________</td>
</tr>
<tr>
<td>Boxes of cakes at £2.05 for 2 boxes</td>
<td>_______ boxes</td>
<td>£ 6.15</td>
</tr>
<tr>
<td>Total cost</td>
<td></td>
<td>£ ________</td>
</tr>
</tbody>
</table>

(b) Jenny pays for her shopping with a £20 note.

Work out how much change Jenny should receive.

(b) £ _____________________________ [1]
Dionne cuts six identical circles from a rectangle of fabric to make mats.

Each circle has a diameter of 10 cm. She leaves 5 mm between each circle and 5 mm from each circle to the edge of the fabric.

(a) What is the length of the rectangle? Give your answer in centimetres.

(b) Dionne draws this regular pattern onto each circular mat.

(i)* Without measuring, explain fully why angle $a$ is $60^\circ$.

_____________________________________________________________________
_____________________________________________________________________

[3]
(ii) The diameter of a mat is 10 cm.

Calculate the **total** length of the lines that Dionne draws on one mat.

(b)(ii) _____________________ cm [3]

(c) It costs Dionne £1.60 to make each mat.
She adds 50% of the cost for her profit.

Calculate the price at which Dionne sells each mat.

(c) £ _________________________ [2]
This right-angled triangle is drawn on a one-centimetre square dotty grid.

Two of these triangles are joined side to side to make a logo. The vertices of the logo must be on dots of the grid.

(a) On this grid, draw a logo made from two of these triangles so that it has only one line of symmetry. Draw and label the line of symmetry.

(b) On the grid below, draw a logo made from two of these triangles so that it has rotation symmetry order two.
6* The SkyHigh balloon company has one hot air balloon. Here is some information about their costs.

<table>
<thead>
<tr>
<th>Monthly loan repayment</th>
<th>£790</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel and other costs for one flight</td>
<td>£160</td>
</tr>
<tr>
<td>Pilot's wage for one year</td>
<td>£24 000</td>
</tr>
</tbody>
</table>

The balloon can carry up to 5 people including the pilot. The price of a ticket for one person is £140.

Calculate the smallest number of flights the balloon must make in a month for SkyHigh to make a profit. Write down any assumptions that you make.
Ten primary school children each did a spelling test and an arithmetic test. Each test was marked out of 20. The marks of seven of the children (A to G) are shown on the scatter graph.

(a) The marks of the other three children are given below.

<table>
<thead>
<tr>
<th>Child</th>
<th>Spelling mark</th>
<th>Arithmetic mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>J</td>
<td>18</td>
<td>19</td>
</tr>
<tr>
<td>K</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

Plot and label these values on the scatter graph.

(b) (i) Describe the type of correlation shown in your diagram.

(b)(i) ___________________________ [1]

(ii) Give a reason why it is difficult to be sure of the strength of the correlation.

__________________________________________________________________ [1]
(c) Suki scored exactly 50% more marks in her arithmetic test than in her spelling test. Which letter represents Suki?

(c) ____________________________ [1]

(d) Pedro learnt his spellings but not his arithmetic. His arithmetic score was much worse than his spelling score. Which letter represents Pedro?

(d) ____________________________ [1]
Niamh plants a bean. She measures the height of the bean plant at noon every Friday for 8 weeks. These are her results.

<table>
<thead>
<tr>
<th>Week</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height (cm)</td>
<td>8</td>
<td>18</td>
<td>33</td>
<td>46</td>
<td>56</td>
<td>63</td>
<td>68</td>
<td>72</td>
</tr>
</tbody>
</table>

(a) Complete the time series graph. The first six points have been plotted for you. [2]
(b) How much has Niamh’s plant grown from week 2 to week 4?

(b) __________________________ cm [1]

(c) The plant grew taller during the 8 weeks.

What else does the graph show you about the way the plant grew?

Use evidence from the graph to support your answer.

_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________
_________________________________________________________________________ [2]

9 (a) Solve this inequality.

\[ x - 1 \leq 6 \]

(a) __________________________ [1]

(b) Represent the inequality \( x \geq 4 \) on this number line.

[1]
10 The graph of $y = 3 - 2x$ is drawn on this grid.

(a) Write down

(i) the value of $y$ where the graph of $y = 3 - 2x$ crosses the $y$-axis,

$$(a)(i) \ y = \boxed{} \ [1]$$

(ii) the gradient of $y = 3 - 2x$.

(ii) $\boxed{} \ [1]$
(b) (i) Complete this table of values for $y = 2x - 1$.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$-2$</th>
<th>$-1$</th>
<th>0</th>
<th>2</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y$</td>
<td>$-5$</td>
<td></td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(ii) On the grid, draw the graph of $y = 2x - 1$ for values of $x$ from $-2$ to $4$.

(c) Use the graphs to solve these simultaneous equations.

\[ y = 3 - 2x \]
\[ y = 2x - 1 \]

(c) \[ x = \underline{\hspace{2cm}} \]
\[ y = \underline{\hspace{2cm}} \] [2]
11 The diagram shows a triangle with one of its sides extended.

Complete these statements to show that $y = a + b$.

$a + b + c = \ldots$ because \ldots

Therefore $a + b = 180 - c$.

Also $y = 180 - c$ because \ldots

Therefore $y = a + b$.

This proves that the exterior angle of a triangle is equal to the sum of the two \ldots opposite angles. [4]