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.
Formulae Sheet: Foundation Tier

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

Volume of prism = (area of cross-section) \times\) length
1 (a) Complete this table.

<table>
<thead>
<tr>
<th>Fraction</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{3}{4}$</td>
<td>=</td>
</tr>
<tr>
<td>=</td>
<td>10%</td>
</tr>
</tbody>
</table>

(b) (i) Jenny has these six cards.

\[
\begin{array}{cccccc}
8 & 7 & 2 & 9 & \times & = \\
\end{array}
\]

Jenny arranges all of the cards to make a correct calculation. Complete the three cards to show this calculation.

\[
\begin{array}{cccc}
9 & & & 2 \\
\end{array}
\]

(ii) Jenny swaps $\times$ for $\div$ but keeps all the other cards.

She makes two different, correct calculations using the six cards. Complete the cards to show these calculations.

\[
\begin{array}{cccccc}
7 & \div & & & & = & 8 \\
\end{array}
\]

[2]
2 a) Tom buys a rose bush costing £3.40 and a garden fork costing £12.75. He pays with a £20 note.

How much change should he receive?

(a) £ _____________________________ [3]

(b) (i) Gita sees these plants for sale. Gita buys 4 of these plants.

How much cheaper is it for Gita to buy 4 plants at the Offer Price than separately?

(b)(i) £ _____________________________ [2]

(ii) These plants produce either red or white flowers. Out of 80 plants, 7 produce white flowers.

Is this more or less than 10% of the plants? Show how you decide.
3 (a) What type of angle is angle $p$?

(b) Work out the size of angle $f$. 

(a) __________________________ [1]

(b) __________________________ ° [2]
4 (a) A square of side 3 cm is drawn on a one-centimetre grid.

How many one-centimetre squares does it contain?

(a) _____________________________ [1]

(b) A square of side 8 cm is drawn on a one-centimetre grid.

How many one-centimetre squares does it contain?

(b) _____________________________ [1]

(c) A square is drawn on a one-centimetre grid and contains 225 of the one-centimetre squares.

How long is one of its sides?

(c) __________________________ cm [1]

(d) A square of side $h$ cm is drawn on a one-centimetre grid.

Complete this statement.

(d) This square contains ______________ one-centimetre squares. [1]
(e) A large cube is made using one-centimetre cubes. Each edge of the large cube is 10 cm long.

How many one-centimetre cubes are used to make the large cube?

(e) _________________________ [1]
5 (a) This graph shows the percentage of carbon dioxide in the atmosphere from 1700 to 1995.

In approximately which year was the percentage of carbon dioxide in the atmosphere 0.031?

(a) ________________________ [1]

(b) This graph shows the world average temperatures from 1865 to 1995.

Describe how world average temperatures have changed from 1865 to 1995. Use figures from the graph in your answer.
6 Here are some situations and some formulas.

<table>
<thead>
<tr>
<th>Situation</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 The distance all around any regular polygon is the same as the number</td>
<td>$t = 2h + 1$</td>
</tr>
<tr>
<td>of sides multiplied by the length of one side.</td>
<td></td>
</tr>
<tr>
<td>2 Alma and Tessa shared a bag of sweets equally and there was one sweet</td>
<td>$p = 5g$</td>
</tr>
<tr>
<td>left. How many sweets altogether were in the bag?</td>
<td>$p = fg$</td>
</tr>
<tr>
<td></td>
<td>$t = \frac{m}{2} + 1$</td>
</tr>
</tbody>
</table>

(a) Match each situation to a formula representing it.
Write the letter for the correct formula next to the number of the situation in the answer space.

(a) Situation 1: Formula ______________

Situation 2: Formula ______________ [2]

(b) For Situation 2 in part (a), explain clearly what each letter represents in the formula you have chosen.

[2]
Alan makes drinks mats.

(a) He cuts out a wooden base that is a regular hexagon of side 3 cm.

Alan covers the top of the base with a pattern of tiles. The tiles are equilateral triangles of side 3 cm.

(i) On the triangular spotty paper, show accurately the pattern of tiles that covers the base.

(ii) Alan uses black triangular tiles and white triangular tiles. Shade your drawing in part (i) so that it has exactly 2 lines of symmetry.

(iii) Using your drawing, work out the sum of the interior angles of a regular hexagon.

(a)(iii) __________________________ ° [2]
(b) Alan designs a new drinks mat. He uses eight of the equilateral triangular tiles to make a quadrilateral.

(i) On the triangular spotty paper below, draw a quadrilateral that he could make.

(ii) Give the mathematical name of your quadrilateral.

(b)(ii) _____________________________ [1]
Paul and Adile talk about their homework.

Paul: I can draw a triangle with two obtuse angles in it.

Adile: I can draw a quadrilateral with two obtuse angles in it.

Is Paul correct?

Is Adile correct?

Explain your reasons.
9 (a) When $\frac{1}{9}$ is changed to a decimal it is recurring, like this:

$$0.11111111 \ldots$$

Show how you would indicate that the decimal is recurring.

(a) _____________________________ [1]

(b) Using division, change $\frac{5}{6}$ to a decimal.

(b) _____________________________ [3]

(c) When $\frac{1}{9}$ and $\frac{1}{3}$ are changed to decimals, both are recurring.

Write down a fraction between $\frac{1}{9}$ and $\frac{1}{3}$ that is not recurring.

(c) _____________________________ [1]
A website gives the price and engine size for different models of one manufacturer's cars.

<table>
<thead>
<tr>
<th>Engine size (litres)</th>
<th>Price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td>12 360</td>
</tr>
<tr>
<td>1.4</td>
<td>13 345</td>
</tr>
<tr>
<td>1.6</td>
<td>16 695</td>
</tr>
<tr>
<td>1.8</td>
<td>20 495</td>
</tr>
<tr>
<td>2</td>
<td>20 095</td>
</tr>
<tr>
<td>2</td>
<td>24 295</td>
</tr>
<tr>
<td>2</td>
<td>29 945</td>
</tr>
<tr>
<td>2.2</td>
<td>27 345</td>
</tr>
<tr>
<td>2.5</td>
<td>25 745</td>
</tr>
</tbody>
</table>

(a) Complete the scatter graph below.
The first six points have been plotted for you.

(b) Draw a line of best fit on your scatter graph.
(c) Describe the correlation between price and engine size.

(c) _____________________________ [1]

(d) This manufacturer is planning to produce a car with a 1.7 litre engine.

What might you expect its price to be?

(d) £ _____________________________ [1]

(e) One of the cars is a sports model that is more expensive than other cars with the same engine size.

Put a ring round the point that represents the sports model. [1]
11 (a) On the grid, draw the graph of $y = 4 - 2x$ for $x$ from -2 to 3.

(b) On the same grid, draw the graph of $y = 3$ and use it to solve these simultaneous equations.

\[
\begin{align*}
y &= 4 - 2x \\
y &= 3
\end{align*}
\]

(b) $x =$ _____________________________  

$y =$ _____________________________ [3]