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 20 pages. Any blank pages are indicated.
Area of trapezium = \( \frac{1}{2} (a + b)h \)

Volume of prism = (area of cross-section) \times\) length
Choose a value from each list to complete the following sentences.

(a) 190 cm  1900 g  190 g  19 kg

The weight of an apple is about ...............................................

(b) 4.5 km  450 cm  45 m  45 ml

The length of a car is about ...............................................

(c) 50 ml  50 cm  5 litres  5 ml

A teaspoon holds about ...............................................

Reflect the shape in the line \( m \).
Ellie (E) is going to a football match with three friends, Alec (A), Karen (K) and Bev (B).

(a) They sit next to each other in a row of four seats. Ellie has to sit in seat 1 or seat 4.

Complete the table to show all twelve possible orders in which they could sit. One has been done for you.

<table>
<thead>
<tr>
<th>Seat 1</th>
<th>Seat 2</th>
<th>Seat 3</th>
<th>Seat 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>A</td>
<td>K</td>
<td>B</td>
</tr>
</tbody>
</table>

(b) There were 78,614 people at the match.

Write this number correct to

(i) the nearest ten,

(ii) two significant figures.
4  (a) Work out.
    (i) 627 + 304

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

    (ii) 47 × 100

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

    (iii) 9.6 ÷ 4

    (iii) .................................................. [2]

    (iv) 35% of 80

    (iv) .................................................. [2]

(b) Write down
    (i) 75% as a fraction,

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

    (ii) \( \frac{3}{5} \) as a decimal.

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

\[ 5 \quad 11 \quad 17 \quad 23 \]

(i) Write down the next term of the sequence.

\[(a)(i) \ \text{..........................................................} \quad [1]\]

(ii) Explain how you worked out your answer.

\[ \text{......................................................................................................................................} \quad [1] \]

Here is the rule to find the next term of another sequence.

\[
\text{multiply the previous term by 4 then subtract 3}
\]

The first term of the sequence is 10.

Find the second term.

\[(b) \ \text{..........................................................} \quad [2]\]

Write these numbers in order of size, smallest first.

\[ 4.02 \quad 4.2 \quad 4.042 \quad 4.024 \quad 4.202 \]

\[ \text{smallest} \]

\[ \text{.................................} \quad \text{.................................} \quad \text{.................................} \quad \text{.................................} \quad \text{.................................} \quad [2] \]
Jamilla records the favourite sweet of 40 children.

<table>
<thead>
<tr>
<th>Sweet</th>
<th>Number of children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chocolate</td>
<td>7</td>
</tr>
<tr>
<td>Jelly</td>
<td>13</td>
</tr>
<tr>
<td>Toffee</td>
<td></td>
</tr>
<tr>
<td>Mint</td>
<td>2</td>
</tr>
<tr>
<td>Caramel</td>
<td>12</td>
</tr>
</tbody>
</table>

(a) Complete her table. [1]

(b) Which sweet is the mode? [1]

(c) Draw a bar chart to represent this data. [3]
8 (a) This is a coordinate grid.

(i) Write down the coordinates of point A.

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

(ii) Plot point C at (-4, 3).

(iii) What type of triangle is ABC?

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

(b) On this circle, centre O, draw a radius.

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9 (a) Simplify the following expressions.

(i) \( a + 4a - 2a \)

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

(ii) \( 3c - 5d + 2c - 2d \)

(ii) .......................................................... \[2\]

(iii) \( b^5 \times b^3 \)

(iii) .......................................................... \[1\]

(b) Solve.

(i) \( 3x = 36 \)

(b)(i) \( x = \) .......................................................... \[1\]

(ii) \( 13 = 4 + 6x \)

(ii) \( x = \) .......................................................... \[2\]

(c) This is a regular hexagon, with side length \( h \).

\[ \begin{align*}
&\text{Write down a formula for the perimeter, } P, \text{ of this shape.}
\end{align*} \]

(c) .......................................................... \[2\]
Mr and Mrs Brown are visiting the zoo with their 4 children, all aged under 16. The children’s 2 grandparents, aged 62, go with them.

(a)* The prices of tickets for the zoo are shown below.

<table>
<thead>
<tr>
<th>Ticket Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult £16.50</td>
</tr>
<tr>
<td>Child (under 16) £12.50</td>
</tr>
<tr>
<td>Over 60s £13</td>
</tr>
</tbody>
</table>

Group Ticket
(2 adults and 2 children)
£53

Work out the cheapest price for these 8 people to enter the zoo. You must show all your working clearly.

The cheapest way ...........................................which costs £ .................................... [5]

(b) The zoo has 8 elephants.
The ages of the elephants are

18  2  7  44  57  36  23  31

(i) Work out the range of the elephants’ ages.

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

(ii) Work out the median age of the elephants.

(ii) ............................................... [2]
(c) One of the elephants is six metres and four centimetres long. 
Write down this length in metres.

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

(d) The lemurs have a rectangular enclosure 11 metres long and 7 metres wide. 
Work out

(i) the perimeter of the enclosure,

(d)(i) ....................................................... m [2]

(ii) the area of the enclosure. 
Give the units of your answer.

(ii) .......................................................... [3]

(e) The zoo is open from 10 am to 6 pm. 
How many hours is the zoo open?

(e) .......................................................... [1]

(f) The family arrived at the zoo at 10 20 and stayed for $6\frac{1}{4}$ hours. 
At what time did they leave the zoo?

(f) .......................................................... [1]
The diagram shows a box in the shape of a cuboid.

Nikki has some of these boxes.
Nikki packs her boxes into a crate in the shape of a cuboid.
The crate has length 2 m, height 50 cm and width 40 cm.

Work out how many of her boxes Nikki can pack into the crate.
Emilea has some cards with letters on them.

Emilea takes a card without looking.

(a) What is the probability the card has a W on it?

(b) What is the probability the card has either an X or a Y on it?

(c) What is the probability the card has a Z on it?
13 (a) What fraction of this shape is shaded?
Give your answer in its simplest form.

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

(b) Work out.

\[
\frac{3}{8} + \frac{1}{2}
\]

(b) .......................................................... [2]

(c) Write \( \frac{23}{6} \) as a mixed number.

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

(d) Write \( 1\frac{5}{8} \) as an improper fraction.

(d) .......................................................... [1]

(e) Work out.

\[
5\frac{3}{5} - 2\frac{1}{6}
\]

(e) .......................................................... [3]
14 Students at a sports college choose activities for games.

In Year 7 they chose between rounders and athletics in the ratio 1:4. There are 60 students in Year 7.

Work out how many chose athletics.

\[
\text{..........................................................} \quad [2]
\]

15 On the circle below, draw accurately a regular octagon. The vertices of the octagon must be on the circumference of the circle.

One vertex has been marked for you.

\[
\text{..........................................................} \quad [2]
\]
Chico sells coffee in his café. He changes the price of a mug of coffee every day. The table shows the number of mugs of coffee he sells and the price on each of ten days.

<table>
<thead>
<tr>
<th>Day</th>
<th>Price (£ per mug)</th>
<th>Number sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.54</td>
<td>55</td>
</tr>
<tr>
<td>2</td>
<td>1.60</td>
<td>53</td>
</tr>
<tr>
<td>3</td>
<td>1.65</td>
<td>39</td>
</tr>
<tr>
<td>4</td>
<td>1.70</td>
<td>49</td>
</tr>
<tr>
<td>5</td>
<td>1.78</td>
<td>41</td>
</tr>
<tr>
<td>6</td>
<td>1.81</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>1.88</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>2.05</td>
<td>25</td>
</tr>
<tr>
<td>9</td>
<td>2.14</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>2.20</td>
<td>21</td>
</tr>
</tbody>
</table>

(a) The first six points have been plotted on the scatter diagram.

Complete the scatter diagram by plotting the last four points. [2]

(b) Describe the correlation shown.

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

(c) Draw a line of best fit on the diagram. [1]
(d) The café closed early one day.

Put a ring around the cross that shows this day. [1]

(e) One day Chico charges £2.00 per mug of coffee.

Use the diagram to estimate how much money **in total** Chico takes this day on coffee.

(e) £ .......................................................... [2]

17 Here is a number pyramid.
The value in each cell is found by adding the values in the two cells beneath it.

```
  9
  5 4
  2 3 1
```

In the number pyramid below, find the value of \(x\).
Show all your working.

```
  43
  3 x+5 2x
```

\[ x = \text{..........................................................} \] [4]
The diagram shows a park ABCD.

Scale: 1 cm represents 100 m

The council want to put a shed inside the park and it must be
- nearer to AB than AD
- less than 400 m from C.

Shade the region where they can put the shed.
You must show all your construction arcs.
(a) Complete this table for \( y = 2x - 3 \).

\[
\begin{array}{cccccccc}
\hline
x & -2 & -1 & 0 & 1 & 2 & 3 & 4 \\
y & -7 & -5 & -1 & & & & \\
\hline
\end{array}
\]

(b) Draw the graph of \( y = 2x - 3 \) for values of \( x \) from -2 to 4.

TURN OVER FOR QUESTION 20
20 Winnie drives 184 miles.  
She drives 60 miles on ordinary roads and the rest on a motorway.  

She completes the journey in $3\frac{1}{2}$ hours.  
She drives at an average speed of 40 mph on ordinary roads.  

Work out her average speed on the motorway.

.................................................. mph [4]