Directions to students

1. You are allowed 90 minutes to answer ALL of Section 2.

2. Section 2 has TWO parts.
   - **Part A**: Questions 26–75 (50 marks)
   - **Part B**: Questions 76–80 (25 marks)

3. Attempt ALL questions in Section 2.

4. Calculators MAY be used in Section 2.

5. The formulae listed on page 4 of the Instruction Booklet may be used in Section 2.

6. Write your answers to Section 2 **Part B** in this booklet.

7. Necessary working should be shown.

8. Write your Centre Number and Student Number in the boxes below.

   **CENTRE NUMBER**

   [Blank boxes for Centre Number]

   **STUDENT NUMBER**

   [Blank boxes for Student Number]
A class was comparing two newspapers to see which contained articles with the most information. They decided that articles with a larger number of sentences contained more information.

Twenty-five articles were randomly chosen from each newspaper.

The number of sentences in each article chosen is shown in the stem-and-leaf plots below.

<table>
<thead>
<tr>
<th>The Express</th>
<th>The Star</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 5 6 7 8 9</td>
<td>0 6</td>
</tr>
<tr>
<td>1 3 4 6 9 9</td>
<td>1 5 8 9</td>
</tr>
<tr>
<td>2 0 1 2 3 4 5 7 7</td>
<td>2 0 1 3 3 5 6 6 7 9 9</td>
</tr>
<tr>
<td>3 0 1 2</td>
<td>3 0 0 1 2 4 7</td>
</tr>
<tr>
<td>4 5 8</td>
<td></td>
</tr>
</tbody>
</table>

(a) What was the largest number of sentences in any article in this survey?

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(b) How many of the articles from ‘The Star’ contained fewer than twenty sentences?

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(c) Chris used the stem-and-leaf plot for ‘The Star’ to obtain the median length of its articles.

Explain what is meant by ‘the median’.

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(d) One entry (represented by □) is missing for ‘The Express’.

Give a possible number of sentences in that article.

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(e) Which newspaper would the class decide contained articles with more information?

Give a reason for your answer.

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QUESTION 77. (5 marks)

(a) Cube I is made from cubes of side 1 cm.

What is its volume in cubic centimetres?
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(b) Cube II is designed to hold 1 litre.

What is its volume in cubic centimetres?
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(c) How many cubes the size of Cube I are needed to fill Cube II?
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(d) If the length of each edge of Cube I is increased by 20%, find the percentage increase in the volume of the new cube.
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.............................................................................................................................................
.............................................................................................................................................

(e) This prism is designed to hold 2 litres.

Give a set of possible values, in centimetres, for $l$, $b$ and $h$.

$l = ............................................$

$b = ............................................$

$h = ............................................$
QUESTION 78.  (5 marks)

(a) Complete the next line in this pattern.

\[ 1^2 = 1 \]
\[ 2^2 = 1 + 3 \]
\[ 3^2 = 1 + 3 + 5 \]

..........................................................................................................................

(b) 

Row 1  
Row 2  
Row 3  

How many triangles will appear in Row 4 of the diagram?

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(c) The diagram is extended to 10 rows.

(i) How many triangles will appear in Row 10?

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(ii) What will be the total number of triangles of this size \( \square \) in the diagram with 10 rows?

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(d) How many triangles are there in Row k?

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QUESTION 79. (5 marks)

(a) Construct a circle outside the square below by

(i) finding the centre of the square and marking it clearly with a cross (X).

(ii) using a pair of compasses to draw a circle which passes through the four corners of the square.

(b) A circle of radius $r$ has a square outside and another square inside, as shown below.

(i) If $r = 4$ cm,
calculate the length of the side of the inside square, correct to 2 decimal places.

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(ii) Complete this statement:

Area of outside square = ........ $\times$ Area of inside square
Sally receives a fixed weekly payment of $200, plus a commission on sales over $2000.

The graph below could be used to determine Sally’s weekly income.

(a) How much does Sally earn if she sells $8000 worth of goods?

(b) Calculate the percentage commission that Sally receives.

(c) Paul receives a commission of 5% on all sales. He does not receive a fixed weekly payment.

   How much does Paul receive if he sells $5000 worth of goods?

(d) On the graph, draw a line which can be used to determine Paul’s income.

(e) In one week, Sally and Paul sell the same value of goods and receive the same income.

   How much did each sell in that week?