Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Date of birth
Day
Month
Year

Scottish candidate number

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1 You may **NOT** use a calculator.

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FORMULAE LIST

Circumference of a circle: \( C = \pi d \)

Area of a circle: \( A = \pi r^2 \)

Theorem of Pythagoras:

\[
\begin{align*}
\text{hypotenuse} & \quad \text{opposite} \\
\text{adjacent} & \quad \text{adjacent}
\end{align*}
\]

\[ a^2 + b^2 = c^2 \]

Trigonometric ratios in a right angled triangle:

\[
\begin{align*}
tan \ x^\circ &= \frac{\text{opposite}}{\text{adjacent}} \\
\sin \ x^\circ &= \frac{\text{opposite}}{\text{hypotenuse}} \\
\cos \ x^\circ &= \frac{\text{adjacent}}{\text{hypotenuse}}
\end{align*}
\]
ALL questions should be attempted.

1. (a) Find $6.47 + 13.9$.

(b) Find $\frac{5}{8}$ of $360$.

(c) Find $12 \times 13$. 

[Turn over]

Marks

1

1

1
2. An overnight ferry left Lerwick at 1745 and arrived in Aberdeen at 0720 the next morning.
   How long did the journey from Lerwick to Aberdeen take?

3. Work out the answer to
   \[17 - 4 \times (-2)\].

   \[\text{Marks} \quad \text{1} \quad \text{2}\]
4. (a) On the grid below, plot the points P(–7,2) and Q(5,–6).

(b) Draw a line joining P to Q.

The point R is halfway along this line. 

Write down the coordinates of R.
5. The fare charged by a taxi firm is:

£3 for the first 500 metres of a journey plus 50p for each additional 500 metres.

(a) Find the fare charged for a journey of 1500 metres.

(b) The fare charged for another journey is £7.
What distance is the journey?
6. Solve algebraically the equation

\[ 7p - 2 = 54 + 3p. \]

7. (a) Complete the table below for \( y = 3x - 2 \).

<table>
<thead>
<tr>
<th>( x )</th>
<th>-2</th>
<th>0</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Draw the line \( y = 3x - 2 \) on the grid.
8. Thirty students were given homework.

The frequency table shows the length of time each student spent on the homework.

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
</tr>
<tr>
<td>25</td>
<td>5</td>
</tr>
</tbody>
</table>

(a) Write down the modal time spent on the homework.

(b) What is the probability that a student, picked at random, spent 20 minutes on the homework?

(c) Complete the table below and find the mean time spent on the homework.

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Frequency</th>
<th>Time × Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>6</td>
<td>60</td>
</tr>
<tr>
<td>15</td>
<td>11</td>
<td>165</td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Total = 30

Total =
9. Margaret has £200 worth of gift vouchers for a jewellery shop. She wants to buy some of the items shown below.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bracelet</td>
<td>£105</td>
</tr>
<tr>
<td>Pendant</td>
<td>£80</td>
</tr>
<tr>
<td>Earrings</td>
<td>£55</td>
</tr>
<tr>
<td>Bangle</td>
<td>£50</td>
</tr>
<tr>
<td>Charm</td>
<td>£30</td>
</tr>
</tbody>
</table>

Margaret wants to buy **three** items.
She can spend a **maximum** of £200.
She does not want to buy more than one of each item.

One combination of **three** items that Margaret can buy is shown in the table below.

<table>
<thead>
<tr>
<th>Bracelet</th>
<th>Pendant</th>
<th>Earrings</th>
<th>Bangle</th>
<th>Charm</th>
<th>Total Value (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>£105</td>
<td>£80</td>
<td>£55</td>
<td>£50</td>
<td>£30</td>
<td>185</td>
</tr>
</tbody>
</table>

Complete the table to show all the possible combinations of items that Margaret can buy.
10. Each card in a pile has a number printed on it.

(a) Seonaid selects these six cards from the pile.
   The number on the last card is hidden.

[6 3 4 1 4 □]

The range of the numbers on the six cards is 8.
Find the hidden number.

(b) Kirsty selects these six cards from the pile.
   The number on the last card is hidden.

[7 8 2 8 1 □]

The mean of the numbers on the six cards is 5.
Find the hidden number.

[END OF QUESTION PAPER]
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\end{align*}
\]
ALL questions should be attempted.

1. Sohail burns off 160 calories when he runs for 20 minutes. 
   For how many minutes would he need to run to burn off 400 calories?

2. Solve algebraically the inequality 
   \[ 7c + 13 < 55. \]
3. A factory produces 4000 widescreen televisions each valued at £950. Calculate the total value of the 4000 televisions. 

*Give your answer in standard form.*
   Jack travels by train and Jill travels by aeroplane.
   The graph below shows their journeys.

   (a) How much sooner than Jack does Jill arrive in Birmingham?

   (b) Calculate the average speed, in miles per hour, of Jack’s journey.
5. (a) Multiply out the brackets and simplify

\[ 5(2m + 7) - m. \]

(b) Factorise \(24 - 18k.\)
6. This empty tank is to be filled with water.

The tank is a cuboid, 90 centimetres long, 60 centimetres wide and 50 centimetres high.

The water fills at a rate of 15 litres every minute. (1 litre = 1000 cm$^3$)

How long will it take to fill the tank?
7. The pie chart shows the share of the votes received by candidates in the Gleniston constituency at the general election in 2005.

(a) A total of 30,960 people voted in the Gleniston constituency. How many people voted for the Liberal candidate?
7. (continued)

The pie chart below shows the share of the votes received by candidates in the Gleniston constituency at the by-election in 2008.

\[(b)\] Describe the \textbf{differences} in the share of the votes received by candidates in the by-election in 2008 and the general election in 2005.
8. Last year Mark rented a villa in Spain in April and October.
   In April the villa cost him £800.
   In October it cost the same number of euros as it did in April.
   How much, in pounds and pence, did Mark pay in October?

<table>
<thead>
<tr>
<th>Exchange Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>April  £1 = €1.33</td>
</tr>
<tr>
<td>October £1 = €1.07</td>
</tr>
</tbody>
</table>
9. A flagpole snaps and falls over into the position shown.

Calculate the height of the flagpole before it fell over.

Do not use a scale drawing.
10. Joe borrows £1400 from a bank.
   The rate of interest is 7.5% per annum.
   Calculate the interest he must pay after four months.

11. Use the formula below to find the value of $P$ when $m = 360$ and $t = 0.45$.

\[ P = \sqrt{\frac{m}{2t}} \]
12. Calculate the height, $h$ metres, of the trapezium shown below.

Do not use a scale drawing.
13. Alysoun bought a mobile phone for £125.
   She sold it a few months later for £80.
   Calculate her loss as a percentage of what she paid for the phone.
14. A badge showing a clown’s head consists of a semi-circle and a triangle.

Calculate the area of the badge in square centimetres.
Give your answer correct to one decimal place.