Fill in these boxes and read what is printed below.

Full name of centre

Town

Forename(s)

Surname

Number of seat

Date of birth

Day

Month

Year

Scottish candidate number

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FORMULAE LIST

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

Trigonometric ratios in a right angled triangle:

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

1. (a) Find $1.564 - 0.38$.

   (b) Find $3.14 \times 7000$.

   (c) Find $\frac{5}{6}$ of 84.

2. A box contains 9 apples and 15 oranges.
   A piece of fruit is chosen at random from the box.
   What is the probability that an apple is chosen?
   Give your answer as a fraction in its simplest form.
3. The table shows the record temperatures for Braemar for the month of November.

<table>
<thead>
<tr>
<th>Record high temperature</th>
<th>16 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Record low temperature</td>
<td>–23 °C</td>
</tr>
</tbody>
</table>

Find the difference between the record high and record low temperatures.
4. (a) Complete the table below for \( y = 3 + 2x \).

<table>
<thead>
<tr>
<th>( x )</th>
<th>(-4)</th>
<th>(0)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( y )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(b) Draw the line \( y = 3 + 2x \) on the grid.
5. This ice cube melts at a rate of 8 cubic centimetres per minute. How long will it take to melt?
6. Evaluate \((g + 2)^2\) when \(g = -5\).
7. Farmer Jones has seventy dairy cows. One day he recorded the amount of milk produced by each cow. The frequency table below shows the results.

<table>
<thead>
<tr>
<th>Amount of Milk (litres)</th>
<th>Number of Cows</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>25</td>
<td>21</td>
</tr>
<tr>
<td>30</td>
<td>13</td>
</tr>
<tr>
<td>35</td>
<td>7</td>
</tr>
<tr>
<td>Total = 70</td>
<td></td>
</tr>
</tbody>
</table>

(a) Write down the modal amount of milk produced.

(b) Complete the table below.

<table>
<thead>
<tr>
<th>Amount of Milk (litres)</th>
<th>Number of Cows</th>
<th>Amount of Milk × Number of Cows</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>15</td>
<td>7</td>
<td>105</td>
</tr>
<tr>
<td>20</td>
<td>17</td>
<td>340</td>
</tr>
<tr>
<td>25</td>
<td>21</td>
<td>525</td>
</tr>
<tr>
<td>30</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Total = 70</td>
<td></td>
<td>Total =</td>
</tr>
</tbody>
</table>
7. (continued)

(c) Find the mean amount of milk produced.
8. Solve algebraically the equation
\[ a + 42 = 3a + 10. \]

9. The table below shows some travel insurance premiums charged by MegaTrip Holidays.

<table>
<thead>
<tr>
<th>Number of days</th>
<th>UK</th>
<th>Europe</th>
<th>Rest of world</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–6</td>
<td>£11</td>
<td>£17</td>
<td>£35</td>
</tr>
<tr>
<td>7–13</td>
<td>£13</td>
<td>£21</td>
<td>£39</td>
</tr>
<tr>
<td>14–20</td>
<td>£16</td>
<td>£26</td>
<td>£43</td>
</tr>
</tbody>
</table>

A group of nine people is travelling around Europe for two weeks. MegaTrip Holidays gives them a group discount of 5% on their travel insurance.

Find the total insurance premium for the group.
10. Use the formula below to find the value of $D$ when $f = 120$ and $t = 16$.

$$D = \frac{f}{100\sqrt{t}}$$
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\sin x^\circ & = \frac{\text{opposite}}{\text{hypotenuse}} \\
\cos x^\circ & = \frac{\text{adjacent}}{\text{hypotenuse}}
\end{align*}
\]
1. This information appears on a carton of fruit juice.

<table>
<thead>
<tr>
<th>NUTRITION INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>per 100 ml</td>
</tr>
<tr>
<td>Energy 48 kcal</td>
</tr>
<tr>
<td>Protein 0.6 g</td>
</tr>
<tr>
<td>Carbohydrate 10.8 g</td>
</tr>
<tr>
<td>Vitamin C 34 mg</td>
</tr>
</tbody>
</table>

   How much protein is in a 250 ml glass of fruit juice?

2. Last year the National Bank made a profit of £970 million. Write this amount in standard form.
3. Solve algebraically the inequality

\[ 7m + 5 < 68. \]

4. The time in Beijing is 7 hours ahead of the time in Edinburgh. When it is 1200 in Edinburgh it is 1900 in Beijing.

Paul leaves Edinburgh on Monday at 0945 to fly to Beijing. His journey takes 13 hours 25 minutes in total. What is the local time when he arrives in Beijing?
5. A hillwalker notes the temperature at various heights during a walk one day. The scattergraph shows the results.

(a) Draw a line of best fit through the points on the graph.

(b) Use your line of best fit to estimate the temperature at a height of 900 metres.
6. (a) Multiply out the brackets and simplify

\[ 4(5u + 11) + 3(1 - 2u). \]

(b) Factorise

\[ 12w + 18. \]
7. Amir travels by train from Dumfries to Glasgow where he then catches another train to Inverness.

His journey is shown on the graph below.

(a) How long does he spend waiting in Glasgow?

(b) Calculate the average speed of the train from Glasgow to Inverness.
8. The following items are on sale at an Eastlife concert.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-shirt</td>
<td>£12</td>
</tr>
<tr>
<td>Signed Photograph</td>
<td>£8</td>
</tr>
<tr>
<td>Baseball Cap</td>
<td>£6</td>
</tr>
<tr>
<td>Poster</td>
<td>£5</td>
</tr>
<tr>
<td>Fluorescent Stick</td>
<td>£2</td>
</tr>
</tbody>
</table>

Rebecca wants to buy three different items.

She wants to spend a maximum of £20.

One combination of three different items that Rebecca can buy is shown in the table below.

<table>
<thead>
<tr>
<th>T-shirt</th>
<th>Signed Photograph</th>
<th>Baseball Cap</th>
<th>Poster</th>
<th>Fluorescent Stick</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>£12</td>
<td>£8</td>
<td>£6</td>
<td>£5</td>
<td>£2</td>
<td>13</td>
</tr>
</tbody>
</table>

Complete the table to show all the possible combinations of three different items that Rebecca can buy.
9. Shoppers at two stores, Lido and Eldi, were asked how much they spent on their last visit to the store.

Listed below are the amounts (in £) spent by ten shoppers at Lido.

48  37  42  57  81  73  64  61  72  39

(a) Find the median.

(b) Find the range.

Another ten shoppers were asked at Eldi.
The median was £67 and the range was £28.

(c) Make two comments comparing the amounts spent by the shoppers at the Lido and Eldi stores.
10. A flight of eight stairs has a bannister attached. Each stair has the dimensions shown here. Calculate the length of the bannister. **Do not use a scale drawing.**
11. Gina travelled from Rome to Aberdeen where she changed 1500 euros into pounds.

She spent £875 in Aberdeen and then changed the rest into Swiss francs before travelling to Zurich.

How many Swiss francs did Gina receive?
12. ABC is a right-angled triangle.
   B lies on the circumference of a circle with centre C.
   The length of AC is 7 centimetres and the size of angle ACB is 55°.

   Calculate the length of the diameter of the circle.

   **Do not use a scale drawing.**
13. Stuart borrows £4500 from a bank.
   The rate of interest is 7.8% per annum.
   Calculate the interest he owes after eleven months.

14. During a sale the price of a roll of wallpaper is reduced from £5.25 to £3.99.
   Calculate the percentage reduction in the price of the roll of wallpaper.

[Turn over for Question 15 on Page fourteen]
15. The floor plan of a concert hall is shown below.

The stage is a rectangle and the seating area is a semi-circle. Calculate the total area of the stage and seating area. Give your answer correct to the nearest square metre.