Candidates answer on the Question Paper. 

Additional Materials: List of Formulae (MF9)
Andy counts the number of emails, \(x\), he receives each day and notes that, over a period of \(n\) days, \(\Sigma(x - 10) = 27\) and the mean number of emails is 11.5. Find the value of \(n\). \[3\]
2 The circumferences, \( c \) cm, of some trees in a wood were measured. The results are summarised in the table.

<table>
<thead>
<tr>
<th>Circumference (( c ) cm)</th>
<th>40 &lt; ( c ) ≤ 50</th>
<th>50 &lt; ( c ) ≤ 80</th>
<th>80 &lt; ( c ) ≤ 100</th>
<th>100 &lt; ( c ) ≤ 120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>14</td>
<td>48</td>
<td>70</td>
<td>8</td>
</tr>
</tbody>
</table>

(i) On the grid, draw a cumulative frequency graph to represent the information. [3]

(ii) Estimate the percentage of trees which have a circumference larger than 75 cm. [2]
3 A box contains 6 identical-sized discs, of which 4 are blue and 2 are red. Discs are taken at random from the box in turn and not replaced. Let $X$ be the number of discs taken, up to and including the first blue one.

(i) Show that $P(X = 3) = \frac{1}{15}$. [2]

(ii) Draw up the probability distribution table for $X$. [3]
A fair tetrahedral die has faces numbered 1, 2, 3, 4. A coin is biased so that the probability of showing a head when thrown is $\frac{1}{3}$. The die is thrown once and the number $n$ that it lands on is noted. The biased coin is then thrown $n$ times. So, for example, if the die lands on 3, the coin is thrown 3 times.

(i) Find the probability that the die lands on 4 and the number of times the coin shows heads is 2. [3]

(ii) Find the probability that the die lands on 3 and the number of times the coin shows heads is 3. [1]

(iii) Find the probability that the number the die lands on is the same as the number of times the coin shows heads. [3]
Blank CDs are packed in boxes of 30. The probability that a blank CD is faulty is 0.04. A box is rejected if more than 2 of the blank CDs are faulty.

(i) Find the probability that a box is rejected. [3]
(ii) 280 boxes are chosen randomly. Use an approximation to find the probability that at least 30 of these boxes are rejected. [5]
6 (a) Find the number of different 3-digit numbers greater than 300 that can be made from the digits 1, 2, 3, 4, 6, 8 if

(i) no digit can be repeated, [3]

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(ii) a digit can be repeated and the number made is even. [3]

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(b) A team of 5 is chosen from 6 boys and 4 girls. Find the number of ways the team can be chosen if

(i) there are no restrictions, \[1\]

(ii) the team contains more boys than girls. \[3\]
In Jimpuri the weights, in kilograms, of boys aged 16 years have a normal distribution with mean 61.4 and standard deviation 12.3.

(i) Find the probability that a randomly chosen boy aged 16 years in Jimpuri weighs more than 65 kilograms.  \[3\]

(ii) For boys aged 16 years in Jimpuri, 25% have a weight between 65 kilograms and \(k\) kilograms, where \(k\) is greater than 65. Find \(k\).  \[4\]
In Brigville the weights, in kilograms, of boys aged 16 years have a normal distribution. 99% of the boys weigh less than 97.2 kilograms and 33% of the boys weigh less than 55.2 kilograms.

(iii) Find the mean and standard deviation of the weights of boys aged 16 years in Brigville. [5]