3. [Maximum mark: 5]

The following table shows the amount of fuel \((y\ \text{litres})\) used by a car to travel certain distances \((x\ \text{km})\).

<table>
<thead>
<tr>
<th>Distance ((x\ \text{km}))</th>
<th>40</th>
<th>75</th>
<th>120</th>
<th>150</th>
<th>195</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount of fuel ((y\ \text{litres}))</td>
<td>3.6</td>
<td>6.5</td>
<td>9.9</td>
<td>13.1</td>
<td>16.2</td>
</tr>
</tbody>
</table>

This data can be modelled by the regression line with equation \(y = ax + b\).

(a) (i) Write down the value of \(a\) and of \(b\).  
(ii) Explain what the gradient \(a\) represents. \([3]\)

(b) Use the model to estimate the amount of fuel the car would use if it is driven 110 km. \([2]\)
3. (a) (i) \(a = 0.0823604, b = 0.306186\)

\[a = 0.0824, b = 0.306\]  \(A1AI\)  \(N2\)

(ii) correct explanation with reference to number of litres required for 1 km

eg \(a\) represents the (average) amount of fuel (litres) required to drive 1 km, (average) litres per kilometre, (average) rate of change in fuel used for each km travelled

\(3\) marks\]

(b) valid approach

\[y = 0.0824(110) + 0.306, \text{ sketch}\]

9.36583

9.37 (litres)  \(A1\)  \(N2\)  \(2\) marks\]

Total \(5\) marks\]

4. (a) correct substitution

\[eg \ 0.3 \times 0.6\]

\[P(A \cap B) = 0.18\]  \(A1\)  \(N2\)  \(2\) marks\]

(b) correct substitution

\[eg \ P(A \cup B) = 0.3 + 0.6 - 0.18\]

\[P(A \cup B) = 0.72\]  \(A1\)  \(N2\)  \(2\) marks\]

(c) (i)

\[\text{Diagram: } A \cap B\]

\(A1\)  \(N1\)

(ii) appropriate approach

\[eg \ 0.3 - 0.18, P(A) \times P(B')\]

\[P(A \cap B') = 0.12 \ (\text{may be seen in Venn diagram})\]  \(A1\)  \(N2\)  \(3\) marks\]

Total \(7\) marks\]