Question 2 **(25 marks)**

An experiment measures the fuel consumption at various speeds for a particular model of car. The data collected are shown in Table 1 below.

Table 1

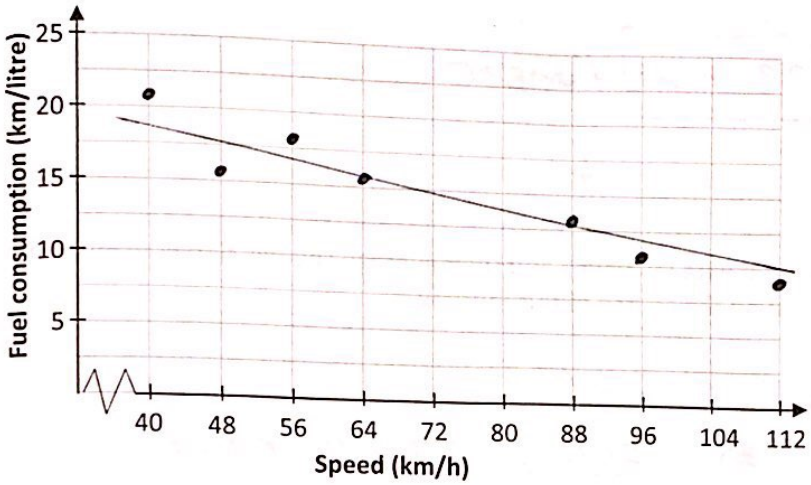
Speed (km/hour)	40	48	56	64	88	96	112
Fuel consumption (km/litre)	21	16	18	16	13	11	9

SEC Set B 2017 P2

(a) Find the correlation coefficient of the data in Table 1, correct to 3 decimal places.

Correlation Coefficient =	−0·957

(b) Plot the points from the table on the grid below **and** draw the line of best fit (by eye).



(c) The slope of the line of best fit is found to be −0·15.
What does this value represent in the context of the data?

The fuel consumption decreases by 0·15 km per litre for every 1 km/hr increase in speed.

(d) Mary drove from Cork to Dublin at an average speed of 96 km/h.
Jane drove the same journey at an average speed of 112 km/h.
Each travelled 260 km and paid 132·9 cents per litre for the fuel.
Both used the model of car used to generate the data in Table 1.

(i) Find how much longer it took Mary to complete the journey.
Give your answer correct to the nearest minute.

$\text{Time} = \frac{\text{distance}}{\text{speed}}$

Mary : $\frac{260}{96} = 2.7 \text{ hrs} = 162.5 \text{ mins}$

Jane : $\frac{260}{112} = 2.32 \text{ hrs} = 139.3 \text{ mins}$

$\therefore$ **23 mins** longer

(ii) Based on the data in Table 1 and their average speeds, find how much more Jane spent on fuel during the course of this journey.

Mary : 11 km/litre

$\Rightarrow \frac{260}{11} = 23.64$ litres

Jane : 9 km/litre

$\Rightarrow \frac{260}{9} = 28.89$ litres

$\Rightarrow$ 5·25 litres extra

$\Rightarrow 5.25(132.9)$ cents

$= 697.725$ cents

$= €6.98$