GCSE Mathematics (Year 10)
Statistics I : Visualising Data

1.1 Scatter Graphs
A scatter graph is a statistical diagram to show correlation between two sets of data.

1.2 The Line of Best Fit
If correlation is detected it makes sense to draw a line of best fit through the data points on the scatter graph to emphasise the correlation found.
If the correlation is positive the line of best fit will have a positive gradient.
If the correlation is negative the line of best fit will have a negative gradient.
There may be negligible correlation in which case no line of best fit should be drawn.

1.3 Outliers
If positive or negative correlation is found, look for outliers.
An outlier is a piece a data that is relatively far from the line of best fit.
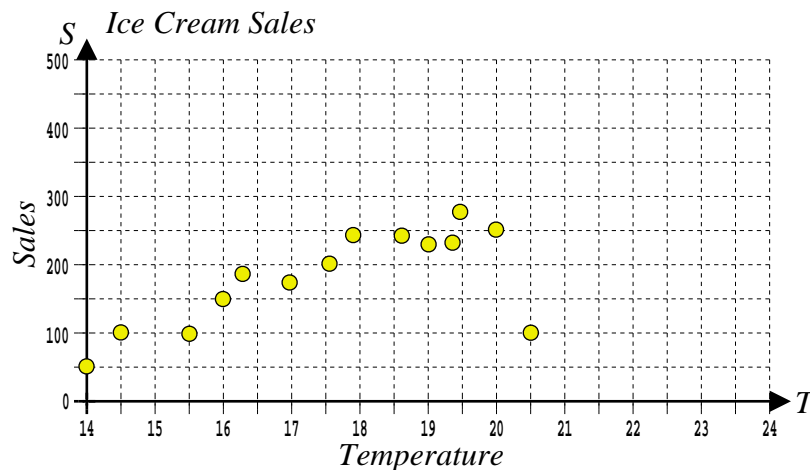(IAn isolated piece of data)

1.4 Making Predictions from a Scatter Graph
If you are asked to make a prediction within the range for which there is data, do so.
Predictions made away from the known data range should be treated with caution.

1.5 Example #1
The sales of ice creams at a shop over a two week period are shown below.

(**i**)   By eye, add a line of best fit to the scatter graph.
(**ii**)   Is the correlation positive, negligible, or negative ?

(**iii**) One day's data is an outlier; Circle that outlier.
(**iv**)   For the following day, the weather forecast is for a temperatures of 24°C.
            Why should the scatter graph not be used to predict that day's sales ?
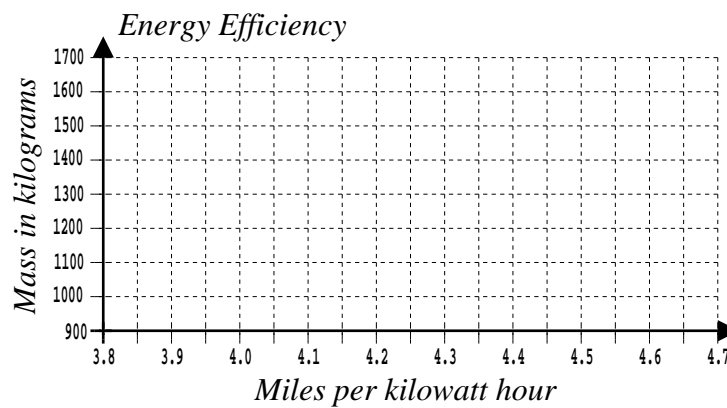
[4 marks]

1.6 Example #2

In May 2023, George and Hamish gathered data for the weights of various makes of electric car along with the number of miles they can travel per kWh.

Model	Weight (kg)	Miles per kWh
Tesla Model 3	1700	4.6
Fiat 500e	1000	4.5
Mini Electric	1400	4.1
Volkswagen e-up!	1500	4.0
Smart EQ fortwo	1300	3.9

(i) Plot a scatter graph for the data.

[**3 marks**]

(ii) Of the cars considered, which is the most energy efficient ?

[**1 mark**]

(iii) Of the cars considered, which is the least energy efficient ?

[**1 mark**]

(iv) Explain why a line of best fit should not be drawn for this scatter graph.

[**1 mark**]