

KS3 – Correlation

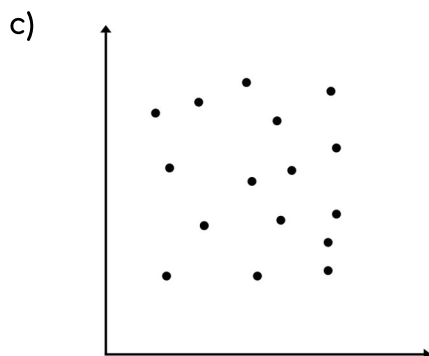
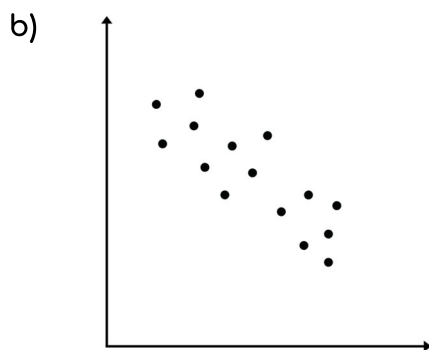
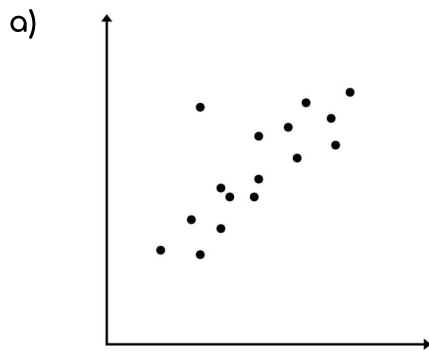
Section A – Correlation

Q1 (6 marks)

Three scatter graphs are shown.

For each graph, state whether it shows positive correlation, negative correlation or no correlation.

Then state which graph shows the strongest correlation.



Q2 (6 marks)

For each pair of variables, state the type of correlation you would expect: positive, negative or no correlation. Give a brief reason.

- a) Hours of revision and test score.

- b) Outside temperature and money spent on home heating.

- c) Shoe size and number of books read in a month.

Q3 (5 marks)

Answer these questions about correlation.

- a) What is meant by positive correlation?

- b) What is meant by negative correlation?

- c) What is meant by no correlation?

- d) Does correlation prove that one variable causes the other? Explain.

- e) Which type of correlation would be shown by points lying very close to a downward-sloping straight line?

Q4 (5 marks)

A scatter graph compares the age of a car with its selling price. The graph shows strong negative correlation.

- a) Describe the relationship between age and selling price.

- b) Would you generally expect an older car to have a higher or lower selling price?

- c) A 4-year-old car is much more expensive than the general pattern. What name is given to a point like this?

- d) Give one possible reason why that car might not follow the general trend.

- e) Explain why you should be cautious about making predictions far outside the range of the data.

Section B – Line of Best Fit

Q5 (8 marks)

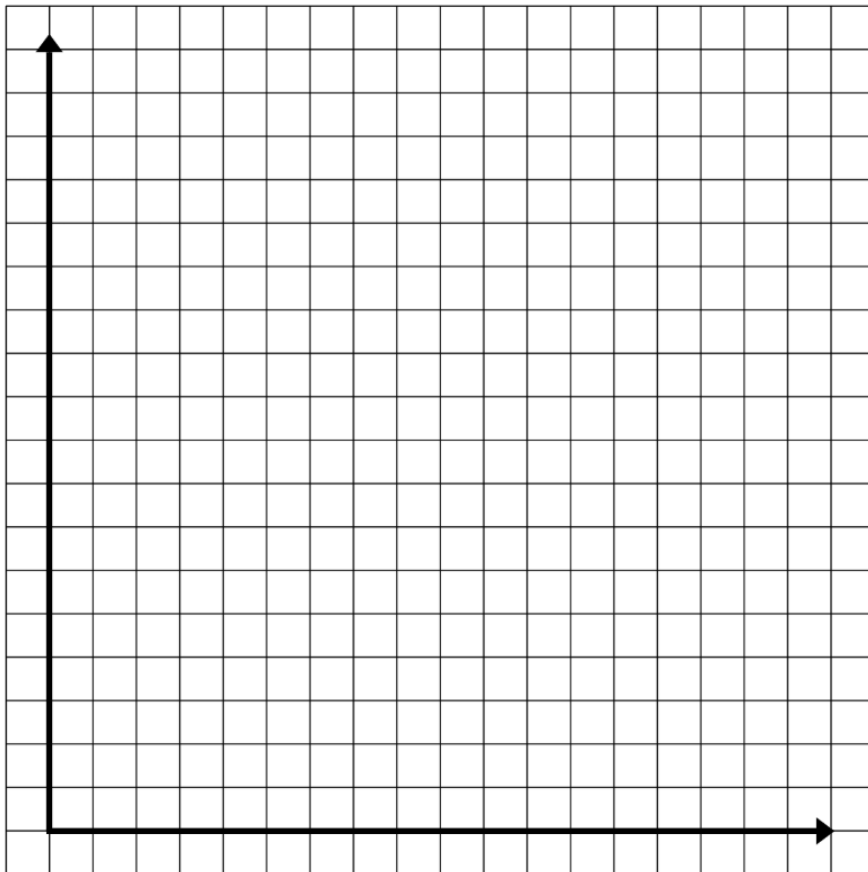
The table gives the number of hours, x , that eight students revised and their test scores, y .

Points: (1, 4), (2, 5), (3, 6), (4, 7), (5, 9), (6, 10), (7, 11), (8, 13)

Plot all eight points on the grid. Label the horizontal axis Hours of revision and the vertical axis Test score. Use 1 unit per grid interval.

Draw a sensible line of best fit.

Use your line of best fit to estimate the test score for a student who revised for 5.5 hours.



Q6 (8 marks)

The coordinates below show a relationship between x and y .

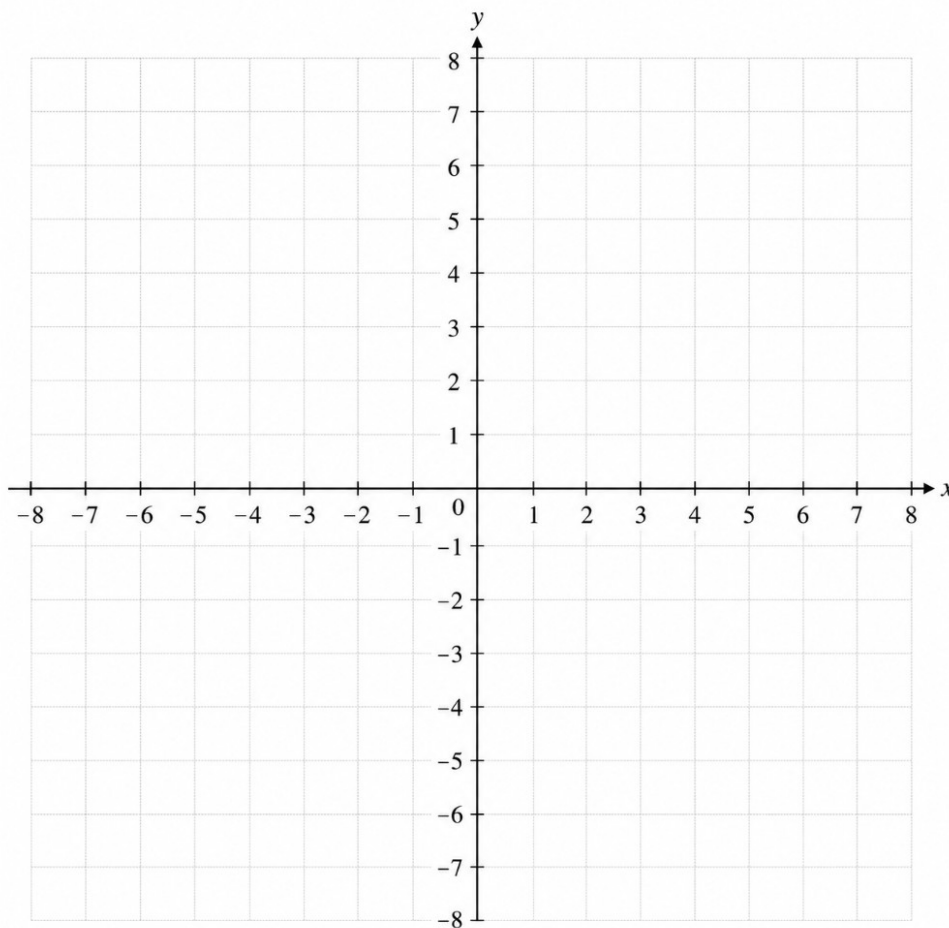
Points: $(-7, 6)$, $(-5, 5)$, $(-3, 3)$, $(-1, 2)$, $(1, -1)$, $(3, -2)$, $(5, -4)$, $(7, -6)$

Plot all eight points on the 4-quadrant grid.

Draw a sensible line of best fit.

State the type of correlation.

Use your line of best fit to estimate y when $x = 4$.



Q7 (7 marks)

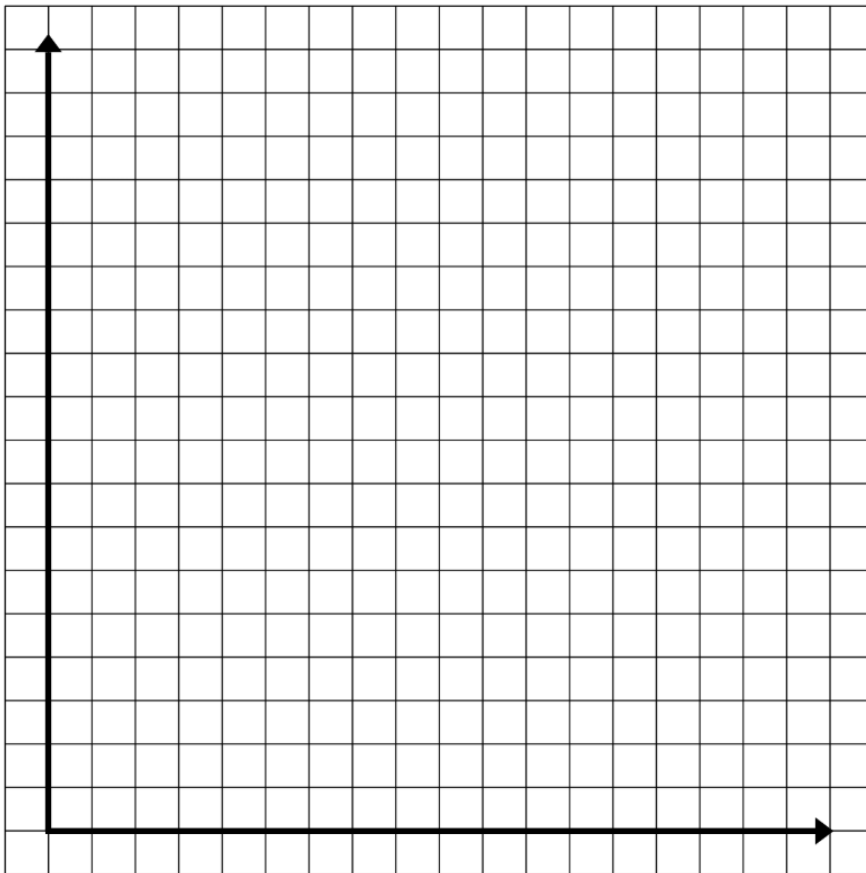
The table gives the temperature at midday, x , and the number of hot drinks sold, y , on seven days.

Points: (4, 13), (6, 12), (8, 10), (10, 9), (12, 7), (14, 5), (15, 4)

Plot the points on the grid. Label the horizontal axis Temperature ($^{\circ}\text{C}$) and the vertical axis Hot drinks sold. Choose sensible scales using the grid.

Draw a line of best fit and describe the correlation.

Use the line to estimate the number of hot drinks sold when the temperature is 11°C .



Q8 (6 marks)

A line of best fit has been drawn through a scatter graph showing weekly exercise time and resting heart rate.

- a) One person's exercise time is 4 hours. The line of best fit gives an estimated resting heart rate of 68 beats per minute. What does this estimate mean?

- b) Another point lies well away from the line of best fit. What is this point called?

- c) Explain why a line of best fit does not need to pass through every point.

- d) Explain why a prediction made within the range of the data is generally more reliable than one made far outside it.

Total: ____ / 51

Percentage: ____%