

Scatter Graphs

KS3 Maths · Follows the national curriculum

Name _____ Class _____ Date _____

1. Worked example

A scatter graph shows: number of hours of TV watched increases, exam scores tend to decrease. Describe and explain this.

Step 1 · Identify the type of correlation

As one variable increases, the other decreases → **NEGATIVE** correlation

Step 2 · Suggest a possible explanation

More TV time may mean less time spent studying, which could lower exam performance

Step 3 · Note the limitation

This is correlation, not proof of direct causation — other factors may be involved

Answer: Negative correlation

Check: The pattern of points slopes downward from left to right ✓

2. Now try one with the steps

How do you draw a good line of best fit?

Step 1 · Check there is correlation first

Step 2 · Use a ruler and follow the direction of the points

Step 3 · Balance the points

Answer:

3. Practice

Show your working. The marks tell you how much is expected.

1. Describe the correlation shown if, x-values increase, the y-values also tend to increase. [1]

2. What does a line of best fit represent on a scatter graph? [2]

3. A scatter graph shows ice cream sales vs daily temperature. Describe the expected correlation and explain why. [2]

4. What is an outlier on a scatter graph? [1]
-
-
5. Explain the difference between correlation and causation, using an example. [3]
-
-
-
6. A scatter graph of house size (m^2) vs house price shows strong positive correlation. A student claims this proves bigger houses ALWAYS cost more. Evaluate this claim. [3]
-
-
-
7. As the age of a car increases, its value tends to decrease. What type of correlation is this? [1]
-
-
8. What correlation would you expect between people's shoe sizes and their maths test scores? [1]
-
-
9. What correlation would you expect between people's heights and their arm spans? [1]
-
-
10. On a scatter graph showing negative correlation, one point sits far above all the others. What is it called? [1]
-
-
11. Two scatter graphs both show positive correlation. In graph A the points lie close to a straight line; in graph B they are widely spread. Which shows stronger correlation? [1]
-
-
12. A line of best fit for hours revised (x) against test score (y) passes through (0, 20) and (10, 70). Use it to estimate the score for 6 hours of revision. [2]
-
-

13. Using the same line of best fit, estimate how many hours were revised by someone who scored 45. [2]
-
-
14. The same line predicts a score of 145 for 25 hours of revision, but the test is out of 100. Why is this estimate unreliable? [2]
-
-
15. At 15°C, 18°C, 21°C and 24°C, a café sold 30, 36, 42 and 48 cold drinks. Estimate the number sold at 20°C. [3]
-
-
-
16. Umbrella sales and the number of people with wet shoes show positive correlation. Does buying umbrellas cause wet shoes? Explain. [2]
-
-

4. Before you hand it in

Claiming that correlation proves one thing causes another

Correlation shows that two things tend to change together — it does NOT prove that one causes the other. There could be a third hidden factor, coincidence, or the relationship could even be reversed.

Drawing a line of best fit that doesn't follow the general trend, or forcing it through the origin unnecessarily

A line of best fit should pass through (or close to) the middle of the data, with roughly equal numbers of points above and below — it does NOT need to pass through the origin (0,0) or touch every point.

Joining the points on a scatter graph dot to dot

Scatter graph points are separate pairs of data with no order. Show the trend with ONE straight line of best fit instead.