

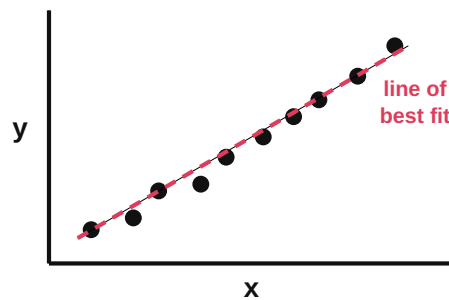
Boost Free Lessons - Year 10 Maths

Lesson 19: Scatter Plots

Name: _____ Grade: _____ Date: _____

Worked Example 1

Describe the relationship shown in the scatter plot below.



1. Look at the overall direction of the points, not at any single point.
2. Here the y values increase as the x values increase, so the correlation is **positive**.
3. Now judge the strength. The points sit close to a straight line, so the correlation is strong.
4. The dashed line of best fit shows the trend and can be used to make predictions.

strong positive correlation

Worked Example 2

A study finds that as hours of study increase, test scores increase. Name the correlation, and say whether study causes higher scores.

1. Both variables increase together, so the correlation is positive.
2. Correlation only shows that two things are associated, not that one causes the other.
3. Another factor could explain both, such as motivation or prior knowledge.
4. This is why we say correlation does not prove causation.

positive correlation, but it does not prove causation

Remember: Positive means both variables increase together. Negative means one increases as the other decreases. Strength depends on how close the points sit to a line, and correlation never proves causation.



Question 1: Name the correlation you would expect between each pair of variables.

1. Height and shoe size
2. Temperature and hot chocolate sales
3. Age of a car and its resale value
4. Hours of exercise and fitness level
5. Shoe size and exam mark
6. Distance travelled and fuel used
7. Speed and travel time over a fixed distance
8. Hair length and IQ



Question 2: Answer the following questions.

1. The points lie close to a line going up. Describe the correlation.

2. The points are widely spread but generally go down. Describe the correlation.

3. The points form no pattern at all. Describe the correlation.

4. The points lie almost exactly on a line going down. Describe the correlation.

5. An outlier is a point far away from all the others. Give one reason an outlier might occur.

6. What does a line of best fit show, and what is it used for?



Question 3: Answer the following questions.

1. A scatter plot of ice cream sales against temperature shows points rising to the right. Name the correlation.
2. Explain why a strong correlation between two variables does not prove that one causes the other.
3. A scatter plot shows hours worked against money earned. What correlation would you expect?
4. Which variable goes on the horizontal axis: the one you control, or the one you measure?
5. The data (1, 3), (2, 5), (3, 7) and (4, 9) is plotted. Describe the relationship.





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Answers: Scatter Plots**Question 1**

- | | |
|-------------|-------------------|
| 1. Positive | 5. No correlation |
| 2. Negative | 6. Positive |
| 3. Negative | 7. Negative |
| 4. Positive | 8. No correlation |

Question 2

- | | |
|--------------------|--|
| 1. Strong positive | 4. Strong negative |
| 2. Weak negative | 5. A measurement or recording error, or a genuinely unusual case |
| 3. No correlation | 6. It shows the overall trend of the data, and is used to make predictions |

Question 3

1. Positive
2. A third factor may affect both variables, or the link may simply be coincidence.
3. Strong positive
4. The one you control, called the independent variable
5. A perfect positive linear relationship. y increases by 2 for every increase of 1 in x .

