

Scatter graphs and correlation

Year 7 About 60 minutes No calculator 45 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-scatter-graphs-and-correlation/

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
- A point is 3 squares right of the origin and 5 squares up. Write its coordinates.
- On an axis, 10 small squares stand for 50 kg. What does one small square stand for?

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 8 [1 mark]
- A pie chart for 100 people has radius 2 cm. What radius shows 900 people to the same scale?
- Write 52 000 in standard form.

Answer

Answer

B Example, then your turn

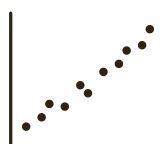
Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

Describe the correlation in each graph and say what it tells you.

Test mark



Revision time

Graph P

Test mark



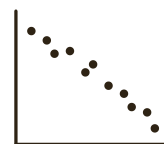
Shoe size

Graph Q

Hint Points going up from left to right: positive.
 Going down: negative. Spread everywhere: none.

- B1** Describe the correlation in each graph and say what it tells you. [3 marks]

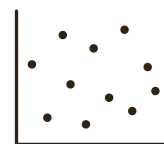
Heating bill



Temperature

Graph R

House number



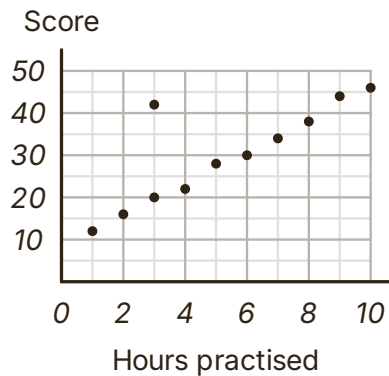
Height

Graph S

EXAMPLE 2

The graph shows the hours 11 pupils practised and their test scores.

- (a) What score did the pupil who practised for 6 hours get?
 (b) Which pupil does not fit the pattern?
 (c) Describe the correlation.



Hint Each small square on the score axis is 5 marks.

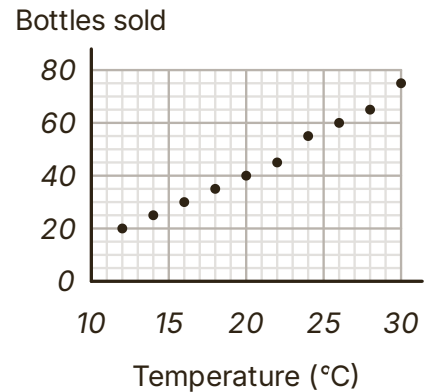
EXAMPLE 3

A town's daily sales of ice creams and its cases of sunburn show positive correlation. Does selling ice creams cause sunburn?

Hint Think of something else that makes both go up at the same time.

- B2** A kiosk sold bottles of water on 10 days. [4 marks]

- (a) How many were sold at 24°C?
 (b) How many days were warmer than 20°C?
 (c) Describe the correlation and what it means.



Answer (a) ... (b) ...

- B3** Weekly sales of winter coats and the town's heating bills show positive correlation. Does buying coats make heating bills go up? Explain. [2 marks]

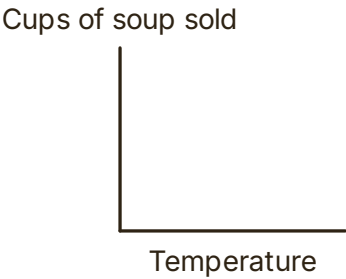
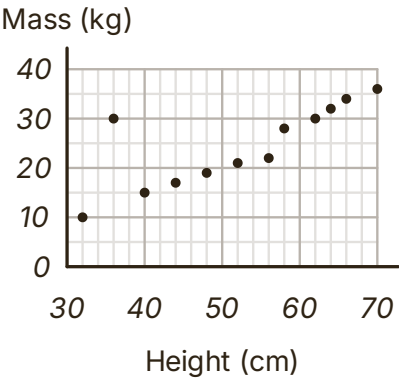
c Practice

Year 7

- C1** Lena drives 10 km at different speeds. What correlation would a scatter graph of speed and time taken show? Give a reason. [2 marks]
- C2** Maths and science marks show positive correlation. Science and art marks show no correlation. Can you say what correlation there is between maths and art? Explain. [2 marks]

- C3**
The graph shows the height and mass of 12 dogs. [3 marks]
- C4**
A café sells more soup when the weather is colder. On the axes, sketch a scatter graph to show this. [2 marks]

- (a) How tall is the dog that does not fit the pattern?
- (b) What fraction of the dogs are taller than 50 cm but lighter than 25 kg?



Answer (a) ... cm (b) ...

D
Exam-style questions
GCSE Foundation

- D1**
A gardener grows tomato plants and records three things about each plant.
- (a)**
Plants that get more hours of sun grow more tomatoes. Describe this correlation and give a possible reason for it. [2 marks]

(b)
Plants with more slugs on them grow fewer tomatoes. Describe this correlation and give a possible reason for it. [2 marks]

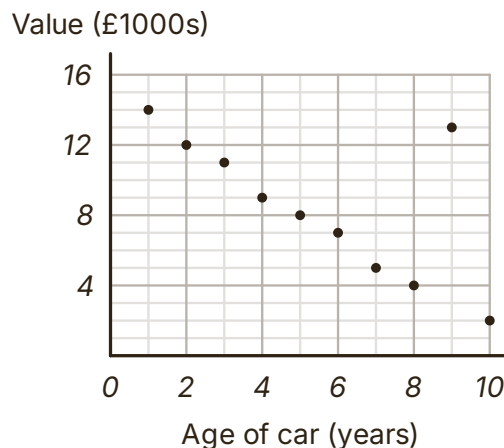
(c)
The height of a plant makes no difference to how many tomatoes it grows. What correlation is this? [1 mark]

Answer

Total for D1: 5 marks

D2 A garage sells 10 used cars. The scatter graph shows the age and value of each car.

- (a) Describe the correlation. How old is the car that does not fit the pattern? [2 marks]



Answer ... ; ... years

- (b) How many of the cars are worth more than £10 000? [1 mark]

Answer

- (c) What percentage of the cars are worth less than £8000? [2 marks]

Answer

Total for D2: 5 marks

D3 Ryan says, "Selling more ice creams makes more people go swimming."

A beach café records how many ice creams it sells and how many people swim each day.

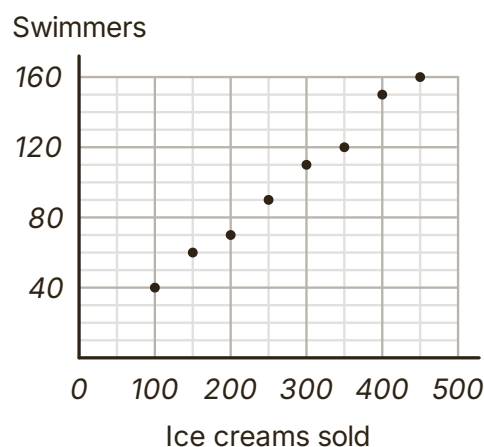
- (a) Describe the correlation. [1 mark]

Answer

- (b) How many people swam on the day 250 ice creams were sold? [1 mark]

Answer

- (c) Explain why Ryan is wrong. [2 marks]

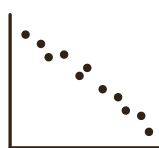


Total for D3: 4 marks

D4 The graphs show the weight of parcels and the cost to post them. Priya says, "The heavier the parcel, the more it costs." Sam says, "Heavier parcels cost less to post." Leo says, "The weight makes no difference to the cost."

- (a) Match each person to a [3 marks]
graph.

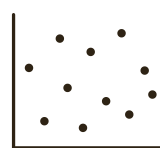
Cost



Weight

Graph A

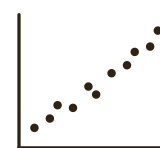
Cost



Weight

Graph B

Cost



Weight

Graph C

Answer Priya ... , Sam ... , Leo ...

- (b) Whose statement is most likely to be true? Give a reason.

[1 mark]

Total for D4: 4 marks

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** In a town, more people buy electric cars, so fewer buy petrol cars. More charging points are built and some petrol stations close. What correlation would you expect, year by year, between (i) electric and petrol cars sold, (ii) electric cars sold and charging points, (iii) petrol cars sold and charging points, (iv) electric cars sold and petrol stations? Do fewer petrol cars cause more charging points? Explain.

[5 marks]

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** For each pair, ask: as one goes up, does the other go up, go down, or neither?
- Hint 2** (i) As electric cars go up, petrol cars go down. (ii) More electric cars, more charging points.
- Hint 3** (iii) Fewer petrol cars, more charging points. (iv) More electric cars, fewer petrol stations. Both changes in (iii) come from people buying electric cars.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can describe the correlation in a scatter graph and say what it means.



I can read values from a scatter graph.



I can find a point that does not fit the pattern.



I can explain why a correlation does not show a cause.

