

Creating scatter graphs

Year 7 About 70 minutes No calculator 45 marks



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

Date _____

A Do Now

Quick questions to start.

- A1** Needed today [1 mark] **A2** Needed today [1 mark]
- The points (2, 5), (4, 9) and (6, 13) lie on a straight line. What is y when $x = 5$?
- On an axis, 5 small squares stand for 10. A point is 3 small squares above 20. What value is it at?

Answer

Answer

- A3** Last lesson [1 mark] **A4** From chapter 8 [1 mark]
- The older a car, the lower its value. What type of correlation is this?
- Round 0.04782 to 2 significant figures.

Answer

Answer

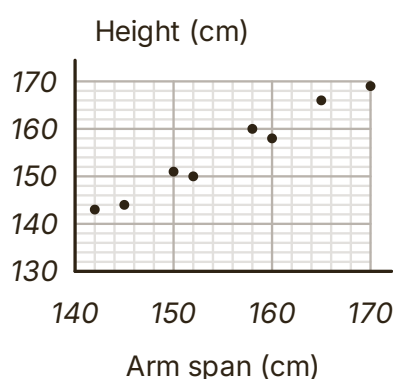
B Example, then your turn

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

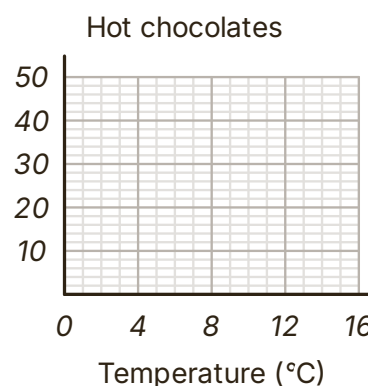
EXAMPLE 1

Arm span and height, in cm, of 8 pupils:
(142, 143), (145, 144), (150, 151), (152, 150),
(158, 160), (160, 158), (165, 166), (170, 169).
Plot the points and describe the correlation.



Hint Each pair is (arm span, height): go across to the arm span, then up to the height. Each small square is 2 cm.

- B1** Temperature (°C) and hot chocolates [4 marks]
- chocolates sold on 8 days:
(2, 44), (4, 40), (6, 38), (8, 30),
(10, 28), (12, 22), (14, 20),
(16, 14). On the grid, plot the points. Describe the correlation and say what it tells you.

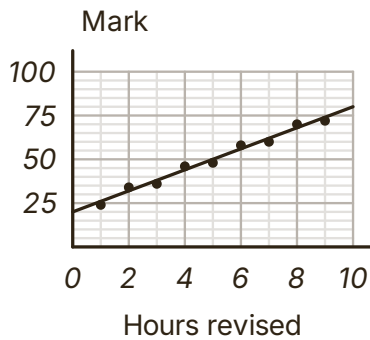


Answer Correlation: ...

EXAMPLE 2

The graph shows the hours 9 pupils revised and their marks, with a line of best fit.

- (a) Estimate the mark for 2.5 hours of revision.
 (b) Estimate the hours revised for a mark of 50.
 (c) Can the line estimate the mark for 30 hours?



Hint Go from the value you know to the LINE, not to a point. Then go across (or down) to the other axis.

B2 The graph shows how far 10 pupils live from school and how long they take, with a line of best fit. [3 marks]

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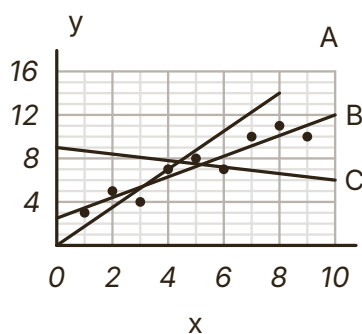
- (a) Estimate the time for 7.5 km.
 (b) Why is the line no use for a pupil who lives 40 km away?



Answer (a) ... min

EXAMPLE 3

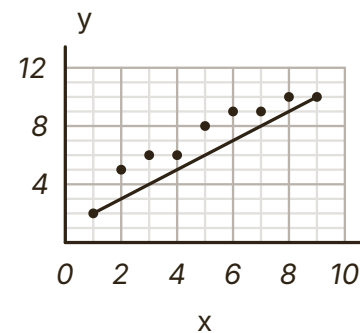
Three lines, A, B and C, are drawn on the same scatter graph. Which is the best line of best fit? Say what is wrong with the other two.



Hint A good line follows the trend, with about as many points above it as below it. It does not have to pass through (0, 0).

B3 Ravi joins the first and last points to make his line of best fit. Is it a good line? Give a reason. [2 marks]

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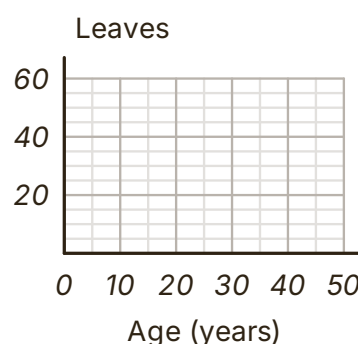
C Practice

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- C1** A line of best fit passes through $(0, 12)$ and $(20, 52)$. Estimate y when $x = 15$, and x when $y = 32$. [2 marks]
- C2** Give two things that make a line of best fit a good one. [2 marks]

Answer $y = \dots$, $x = \dots$

- C3** One point on a scatter graph is far away from all the others. Should Kim make her line of best fit pass through it? Explain. [2 marks]
- C4** A tree's age (years) and the leaves on one branch: $(10, 45)$, $(20, 40)$, $(30, 30)$, $(40, 25)$, $(50, 15)$. On the grid, plot the points and draw a line of best fit. [3 marks]



D Exam-style questions

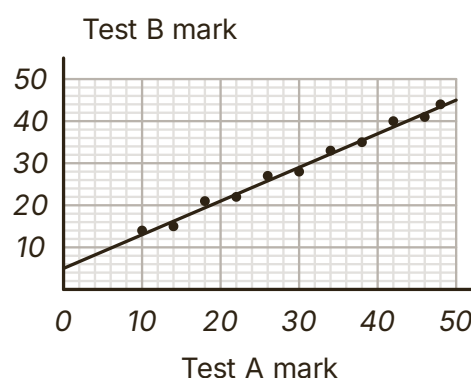
GCSE Foundation

- D1** The graph shows the marks of 11 pupils in two tests, with a line of best fit. Some pupils missed one of the tests.

- (a) Dan scored 40 in test A and missed test B. Eve scored 21 in test B and missed test A. Estimate Dan's test B mark and Eve's test A mark. [2 marks]

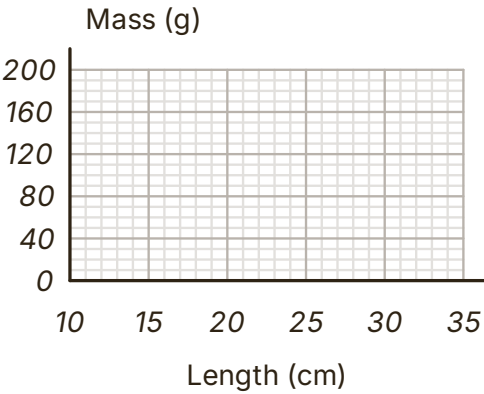
Answer Dan $\dots$, Eve $\dots$

- (b) Fay scored 2 in test A. Why would an estimate of her test B mark be less reliable? [2 marks]



Total for D1: 4 marks

- D2** Length (cm) and mass (g) of 9 fish: (12, 40), (15, 60), (18, 70), (22, 90), (25, 120), (28, 130), (30, 150), (32, 160), (35, 180).
- (a) On the grid, plot the points and draw a line of best fit. [3 marks]



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

Answer

- (c) Use your line to estimate the mass of a fish 26 cm long. [2 marks]

Answer ... g

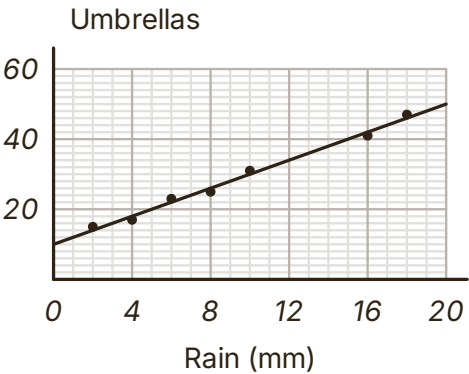
Total for D2: 6 marks

- D3** The graph shows the rainfall and the umbrellas a shop sold on 7 days, with a line of best fit.

- (a) Estimate the umbrellas sold on a day with 12 mm of rain. [1 mark]

Answer

- (b) On another day 14 mm of rain fell and 24 umbrellas were sold. How many fewer is that than the line predicts? [2 marks]



Answer

Total for D3: 3 marks

D4

Raj says, "The line shows that a 40-month-old phone has a battery life of 0 hours."

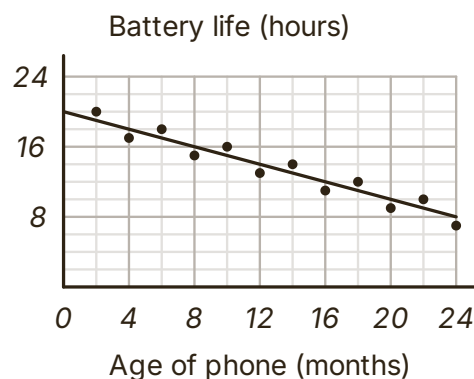
The graph shows the age and battery life of 12 phones, with a line of best fit.

(a) Describe the correlation.

[1 mark]

Answer

(b) Estimate the battery life of a 10-month-old phone, and the age of a phone whose battery lasts 12 hours. [2 marks]



Answer ... hours; ... months

(c) Explain why Raj should not trust this.

[2 marks]

Total for D4: 5 marks

E Extension

Stretch

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

E1 A good line of best fit passes through the mean point: (the mean of the x values, [5 marks] the mean of the y values). For the data in the table, a line of best fit also passes through $(0, 8)$. Estimate y when $x = 9$, and x when $y = 18$.

x	2	4	6	8	10
y	15	24	26	35	40

Answer $y = \dots$, $x = \dots$

Extension hints

Cover these with paper. Uncover one at a time.

E1 Hint 1 Work out the mean of the x values and the mean of the y values. That point is on the line.

Hint 2 The mean point is $(6, 28)$. From $(0, 8)$ the line goes up 20 while it goes across 6.

Hint 3 That is up 10 for every 3 across. At $x = 9$: $8 + 30 = 38$. For $y = 18$, go up 10 from 8: across 3.

How did it go?

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

I can plot a scatter graph from a table.



I can draw a line of best fit and say if a line is a good one.



I can use a line of best fit to estimate a value.



I can say when an estimate from a line is not reliable.

