GCSE Maths: Line graphs and time series (Higher): answers

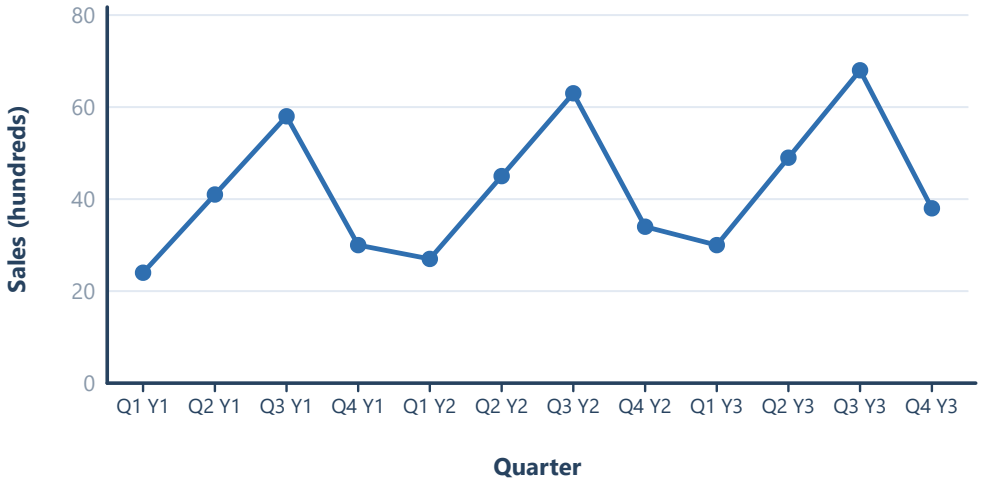
GCSE Maths - Statistics - Higher - Lesson 24.8

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at **websink.site/gcse/maths/ch24-statistics/higher/line-graphs-and-time-series/**

Exercise 24H Line graphs and time series

Non-calculator

1 The graph shows the ice cream sales (in hundreds) for each quarter over three years. (a) In which quarter were sales lowest? (b) Work out the total sales in Year 2. (c) What was the increase in sales in Q4 from Year 1 to Year 3?



(a) Lowest quarter

Answer: Q1 of Year 1

(b) Total sales in Year 2

Answer: 169 hundred

(c) Increase in Q4

Answer: 8 hundred

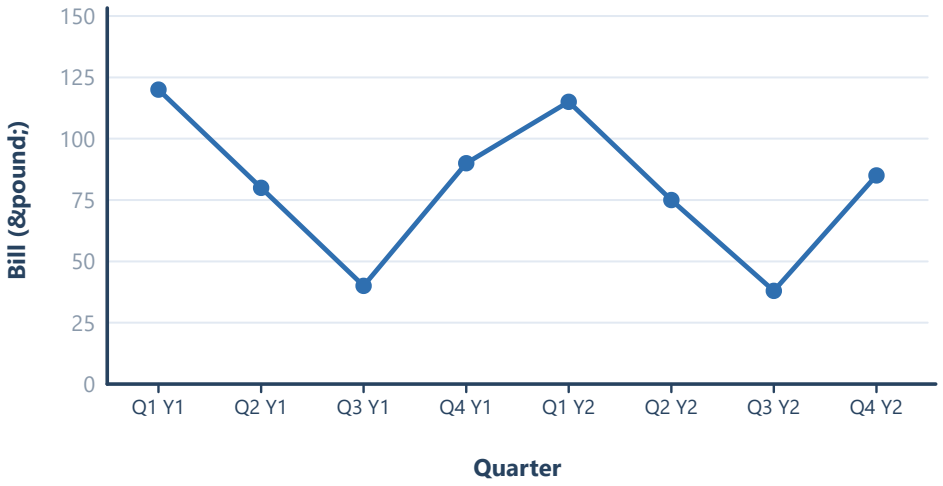
2 The table shows the number of visitors to a website each month.

Month	Jan	Feb	Mar	Apr	May	Jun
Visitors	120	150	210	260	240	300

Draw a line graph to show this information.

Answer: See the line graph in the solution

3 The graph shows a family's gas bill (in £) for each quarter over two years. Describe (a) the seasonal pattern and (b) the trend.



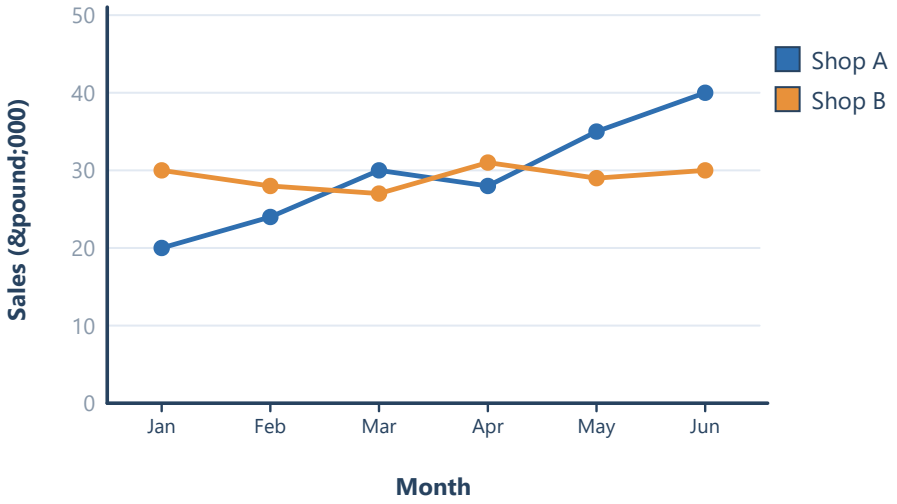
(a) Seasonal pattern

> **Answer:** The bill is highest in Q1 and lowest in Q3 each year (winter highest, summer lowest).

(b) Trend

> **Answer:** The bills are slowly falling from year to year (each quarter is £5 less, or a little less, than a year before).

4 **The graph shows the monthly sales (in thousands of pounds) of two shops, A and B. (a) In which month did shop A first have higher sales than shop B? (b) How much higher were A's sales than B's in June? (c) Which shop has more steady sales? Give a reason.**



(a) First month A is higher

> **Answer:** Mar

(b) June difference

> **Answer:** £10 thousand

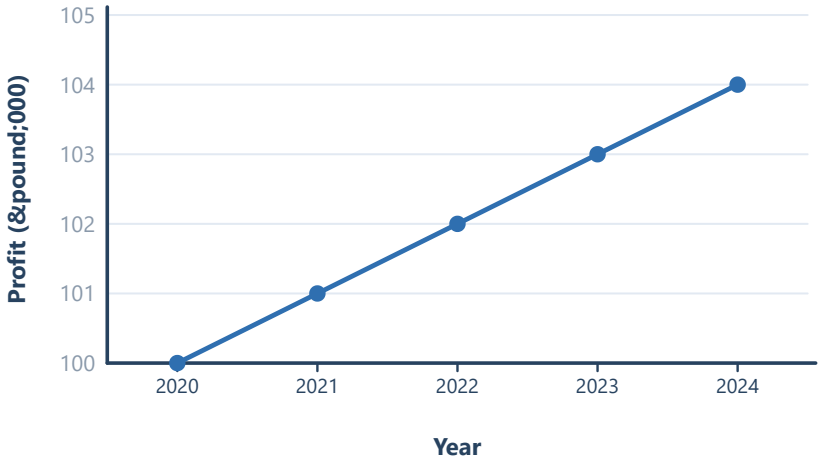
(c) More steady

> **Answer:** Shop B, because its sales stay between £27 000 and £31 000.

5 **Use the ice cream data. The Q1 sales in the three years were 24, 27, 30 hundred. Estimate the Q1 sales in Year 4 if the pattern continues.**

> **Answer:** 33 hundred

6 A company shows this line graph of its profit and says "our profit is growing very fast". Explain why the graph may be misleading.



> **Answer:** The vertical axis starts at 100, not 0. The profit only rose from 100 to 104 (4%).

7 Dev records the favourite colour of 5 students and draws a line graph joining the points for red, blue, green, yellow, black. Explain why this is not appropriate.

> **Answer:** The colours are categories, not a quantity changing over time, so joining the points has no meaning. A bar chart should be used.

8 The temperature was recorded at 12 noon (14°C) and at 2 pm (18°C). (a) Estimate the temperature at 1 pm. (b) Explain why your answer to (a) is only an estimate.

(a) Temperature at 1 pm

> **Answer:** 16°C

(b) Why only an estimate

> **Answer:** The temperature may not have changed steadily between the readings (a cloud could have passed over).

9 Work out the mean quarterly sales in Year 2 from the ice cream graph, giving your answer to 2 decimal places.

> **Answer:** 42.25

10 Ice cream sales in Q3 were 58, 63, 68 hundred in Years 1, 2 and 3. If the trend continues, in which year will Q3 sales first be over 100 hundred? Comment on the reliability.

> **Answer:** Year 10 (about 103); not reliable because it is a long extrapolation.

11 The table shows the temperature in a classroom at different times.

Time	8am	9am	10am	11am	12pm	1pm	2pm	3pm
Temperature (°C)	12	14	17	19	21	22	20	18

Draw a line graph to show this information.

> **Answer:** See the line graph in the solution

12 Sam looks at a graph of umbrella sales. Sales were 40 in January and 28 in March. He says: "Sales are falling, so the shop will soon sell no umbrellas." Give two reasons why this conclusion may be wrong.

Answer: Two points do not show a trend, and sales may follow a seasonal pattern that rises again.

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