Your notes

GCSE Statistics: revision notes

Time series and moving averages

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Time series graphs

- A **time series** is data recorded at regular intervals over time, such as monthly sales. Plot it with time on the horizontal axis and join the points with straight lines.
- The **trend** is the general direction over time. **Seasonal variation** is a pattern that repeats, such as higher ice cream sales every summer. Random variation is unpredictable.

Moving averages

- **Moving averages** smooth out **seasonal variation** to show the **trend**. Use the same number of points as the length of the pattern: 4 points for quarterly data and 12 for monthly data.
- Example: quarterly sales 10, 14, 12, 16, 18. The first 4-point **moving average** is (10 + 14 + 12 + 16) ÷ 4 = 13. The next is (14 + 12 + 16 + 18) ÷ 4 = 15.
- Plot each **moving average** at the middle of the time period it covers, then draw a **trend line** through them.

Seasonal variation and predictions

- **Seasonal variation** for a point = actual value – **trend** value.
- The **mean seasonal variation** for a season (such as quarter 1) is the average of all its **seasonal variations**.
- To predict: read the **trend line** forward, then add the **mean seasonal variation**. If the predicted **trend** for next quarter 3 is 40 and its mean seasonal variation is –5, the prediction is 35.

Key terms

Time series	Data recorded at regular intervals over time.
Trend	The general direction of data over time.

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Seasonal variation	A pattern that repeats over a regular period.
Moving average	An average of a set number of consecutive values, moved along one at a time.
Trend line	A line drawn through the moving averages to show the trend.
Mean seasonal variation	The average difference between actual values and the trend for one season.

Your notes

Quick questions

Cover the answers and test yourself: remembering is what makes it stick.

1. What does a moving average do?
2. How many points should a moving average use for quarterly data?
3. Sales are 10, 14, 12 and 16. What is the 4-point moving average?
4. What is seasonal variation?
5. The actual value is 42 and the trend value is 38. What is the seasonal variation?
6. Where do you plot a moving average?
7. Trend prediction is 40 and the mean seasonal variation is –5. What is the prediction?
8. What is the trend?

Answers

1. Smooths out seasonal variation to show the trend
2. 4
3. 13
4. A pattern that repeats over a regular period
5. 4
6. At the middle of the time period it covers
7. 35
8. The general direction of the data over time

What to do next

Practise 10 questions on this topic

Try 3 exam questions, with mark schemes

Read the lesson, one step at a time

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