

Analysing time series graphs (TSN)



Look for the long-term **Trend**, **Seasonality**, and **Noise** in each graph.

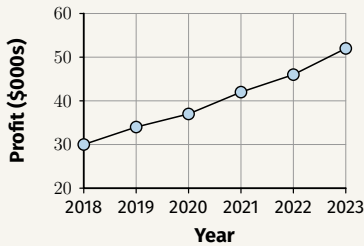
Name _____

Date _____

Reading a time series graph

A time series graph plots data against time. Look for three things: the long-term **Trend** (increasing or decreasing, looking past the small ups and downs – never “positive”/“negative”), **Seasonality** (a pattern that repeats at a regular interval), and **Noise** (an unusual point that doesn't fit either pattern).

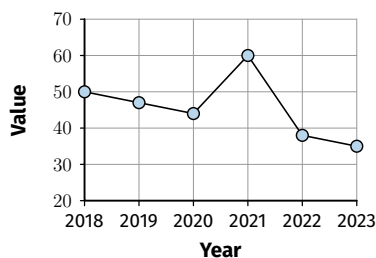
Worked example This graph shows a company's yearly profit. Describe the long-term trend.



Profit rises steadily from \$30,000 in 2018 to \$52,000 in 2023. This is an **increasing** long-term trend.

1. Describe the long-term trend shown in this graph. Which point does not fit the trend?

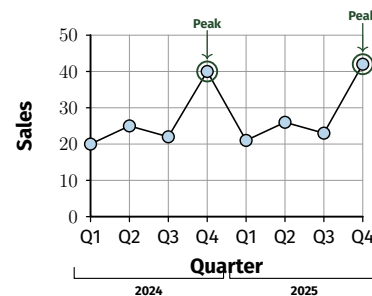
Solution: Decreasing trend (50 down to 35). The 2021 point (60) is noise.



Working

2. Which quarter is highest in both years? What TSN component does this pattern show?

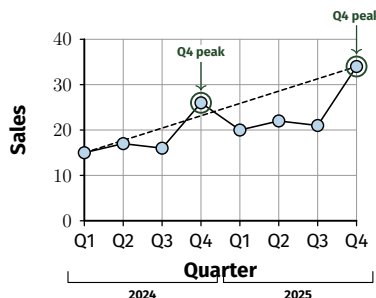
Solution: Q4 is highest both years (40, 42). This is seasonality.



Working

3. Describe both the long-term trend and the seasonal pattern shown in this graph.

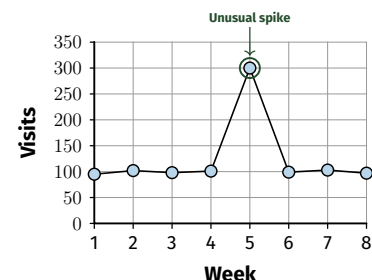
Solution: Increasing trend (each year's quarters sit higher than the previous year's); Q4 is a seasonal peak each year.



Working

4. This graph shows weekly website visits. Which point is noise? Suggest a possible cause.

Solution: Week 5 (300 visits) is noise – a one-off spike; e.g. a viral post or news story that week.



Working

Analysing time series graphs (TSN) (continued)



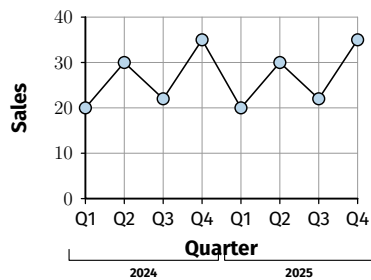
Look for the long-term Trend, Seasonality, and Noise in each graph.

Name _____

Date _____

5. Does this graph show a long-term trend? Explain your answer using the pattern you see.

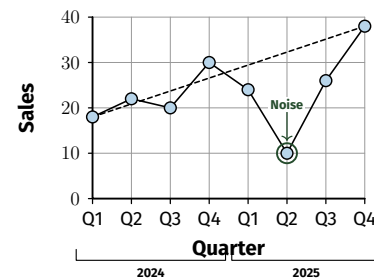
Solution: No clear trend – 2025 repeats 2024's pattern (20,30,22,35) exactly, with no overall rise or fall. Seasonality without trend.



Working

6. Identify the trend, seasonality, and noise shown in this graph.

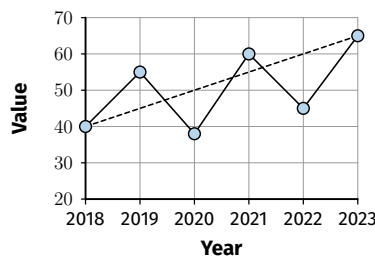
Solution: Trend: increasing overall. Seasonality: Q4 highest each year. Noise: 2025 Q2 (10) is unusually low.



Working

7. The dashed line shows the overall trend. Describe it. Which point looks like noise?

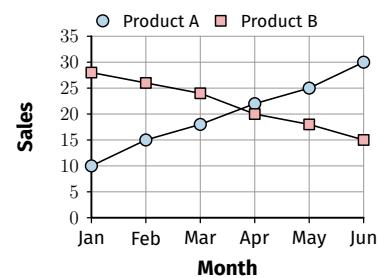
Solution: Increasing trend, roughly 40 up to 65. The 2020 point (38) sits well below the line – noise.



Working

8. Compare the trend of Product A and Product B.

Solution: Product A: increasing (10 to 30). Product B: decreasing (28 to 15) – opposite directions.



Working