

WA6MPSS2

Statistics

Core + Challenge

Misleading Graphs

I can spot how a graph might mislead people and redraw it honestly.

Name: _____ Date: _____ Score: _____ / 58

Key idea

A graph can be drawn to **mislead**: to make a difference look **bigger** or **smaller** than it really is.

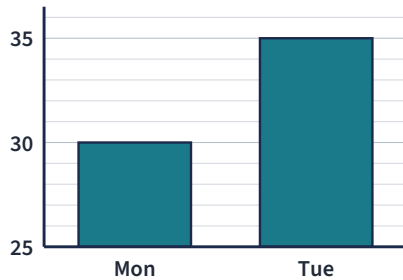
Check the **vertical axis**. Does a column graph start at **0**? Are the steps **equal**?

Check **pictograms**: every icon should be the **same size**. Check the **time range**: has part of the data been left out?

Example: 30 and 35 juices. With the axis starting at 25, Tuesday's column looks **twice** as tall, but 35 is only 5 more than 30.

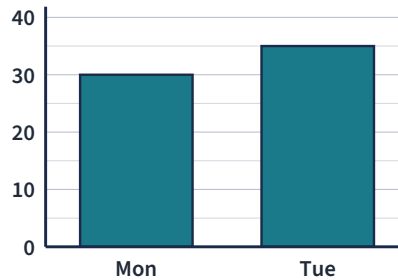
Misleading: starts at 25

Juices



Honest: starts at 0

Juices



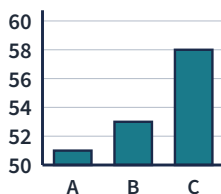
A

Warm up *spot the trick*

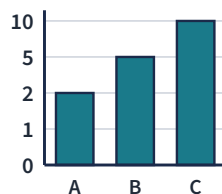
/ 16 marks

What makes each graph **misleading**? 1 mark each.

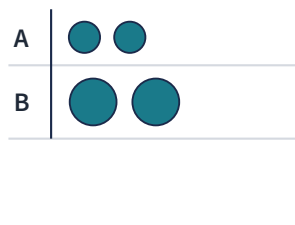
1



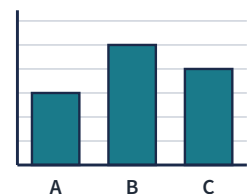
2



3



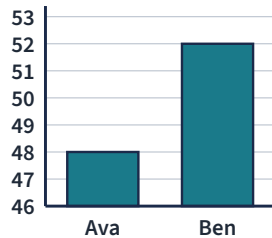
4



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Graph A shows class captain votes, pictogram B shows ice-creams sold and graph C shows swimmers at Cottesloe Beach. 1 mark each.

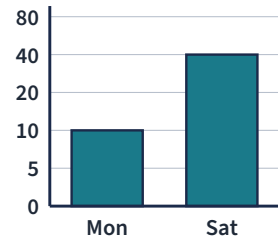
A Votes



B Ice-creams



C Swimmers



- 5 A: how many votes did Ava get?

- 6 A: how many votes did Ben get?

- 7 A: Ben's column looks how many times as tall?

- 8 A: how many **more** votes did Ben really get?

- 9 B: ice-creams sold on Monday?

- 10 B: ice-creams sold on Tuesday?

- 11 B: ice-creams sold on Wednesday?

- 12 B: which day **really** sold the most?

- 13 C: swimmers on Monday?

- 14 C: swimmers on Saturday?

- 15 C: Sat's column looks how many times as tall?

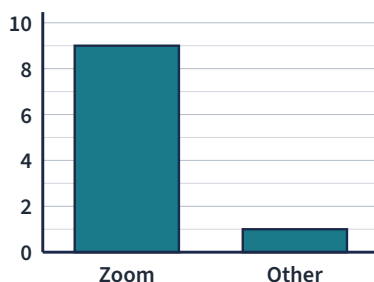
- 16 C: how many times as many swimmers, really?

B Practise use the skill

/ 23 marks

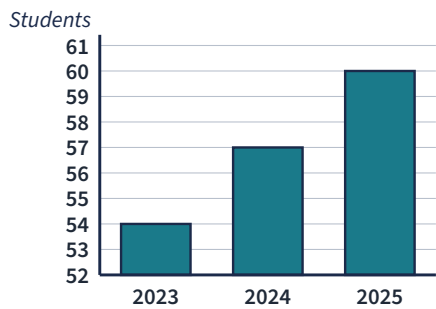
- 1 A poster says, "9 out of 10 kids prefer Zoom cereal!" The survey asked 10 kids at a Zoom cereal party. Give **two** reasons why the poster might mislead people. [2 marks]

Kids



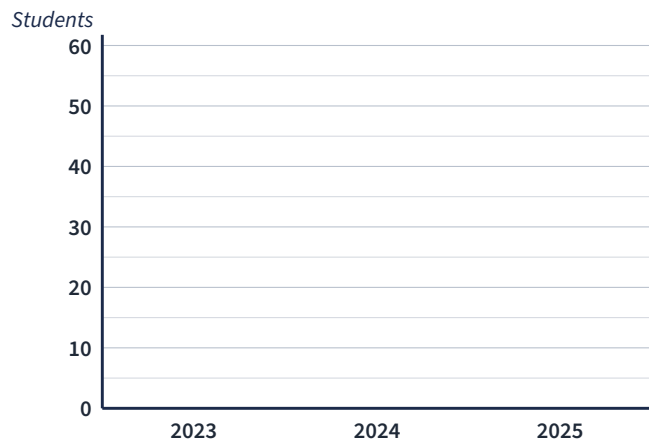
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- 2 This graph shows the number of students who ride to school. **a)** 2025's column looks how many times as tall as 2023's? **b)** Redraw the graph **honestly** on the blank axes. **c)** By how many students did riding really grow from 2023 to 2025? [3 marks]

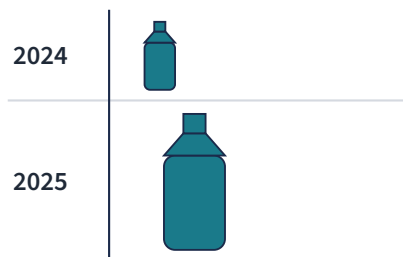


a) _____

c) _____



- 3 A recycling poster shows **200** bottles collected in 2024 and **400** in 2025. The artist drew the 2025 bottle **twice as tall** and **twice as wide**. **a)** How many times bigger does the 2025 bottle look? Explain. **b)** Draw an **honest** pictogram using the key. [3 marks]



a) _____

- 4 A school asked **50** boys and **20** girls, “Do you play a weekend sport?” The graph shows how many said yes. **a)** What does the graph seem to show? **b)** What **fraction** of the boys and of the girls play a sport? **c)** Is the graph's message fair? Explain. [3 marks]



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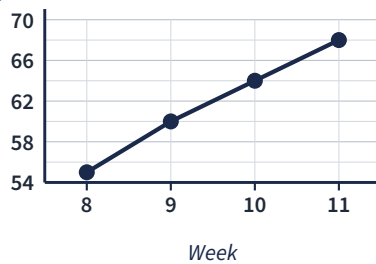
- 5 Draw a line to match each misleading feature to the way to fix it. [2 marks]

Axis starts at 90	•	•	Show the whole year
Icons of different sizes	•	•	Start the axis at 0
Steps 0, 10, 20, 50, 100	•	•	Use equal steps
Only 3 good months	•	•	Same-size icons

- 6 A shop's advert shows its weekly sales for weeks 8 to 11 only. The full graph shows all 12 weeks. **a)** What does the advert suggest? **b)** What does the full graph really show? **c)** Why might the shop have chosen weeks 8 to 11? [3 marks]

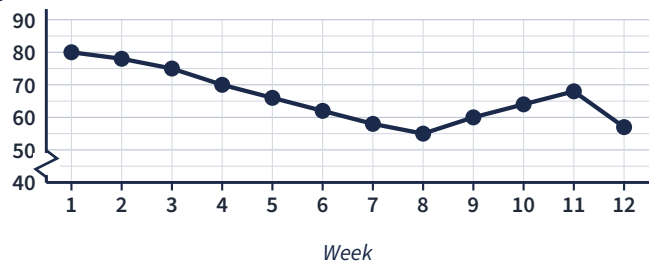
Advert

Sales



Full graph

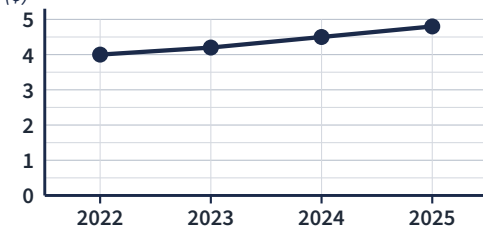
Sales



- 7 Graphs A and B both show the price of a canteen pie. **a)** A parents' group wants to complain that pies are getting **much** dearer. Which graph would they use? Why? **b)** How much did the price really rise from 2022 to 2025? [2 marks]

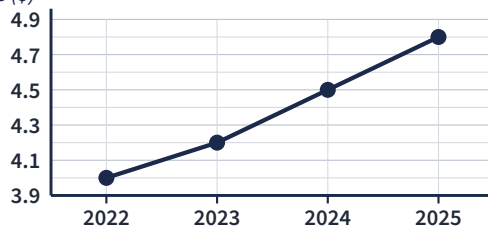
A

Price (\$)



B

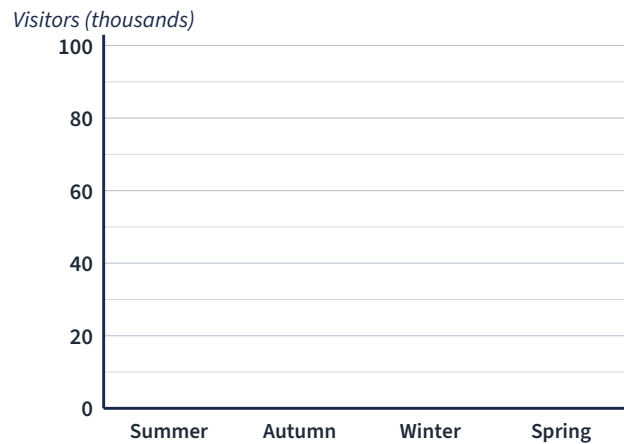
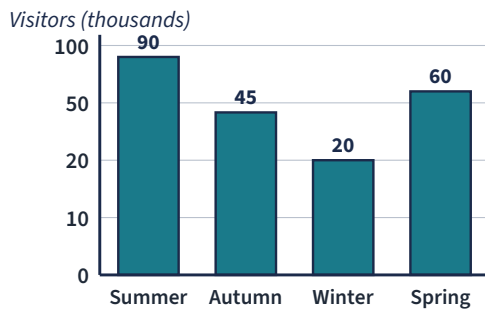
Price (\$)



Answer: _____

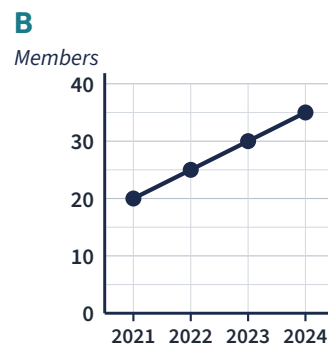
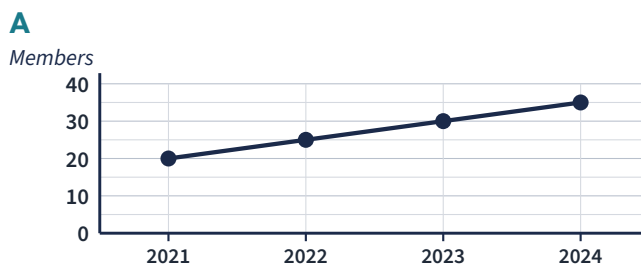
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- 8 This graph shows visitors to Rottnest Island in each season. **a)** What is wrong with the scale? **b)** Redraw the graph with an **even** scale. **c)** Summer really had how many times as many visitors as winter? [3 marks]



- a) _____
c) _____

- 9 Both graphs show the members of a netball club. **a)** Which graph makes the club look like it is growing **faster**? **b)** Do the graphs show the same data? How much did the club really grow? [2 marks]



- a) _____
b) _____

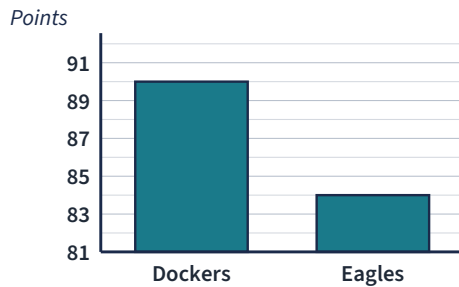
C Think it through *explain your thinking*

/ 10 marks

- 1 **True or false?** “A **column** graph should always start its vertical axis at 0.” [2 marks]
Explain.

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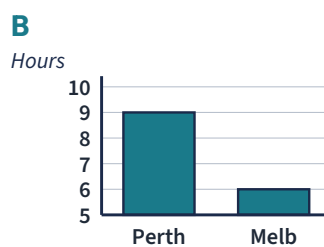
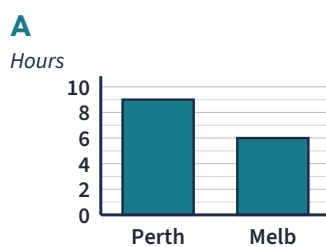
- 2 Noah looked at this graph and said, “The Dockers scored **three times** as many points as the Eagles.” Do you agree with Noah? Explain. [2 marks]



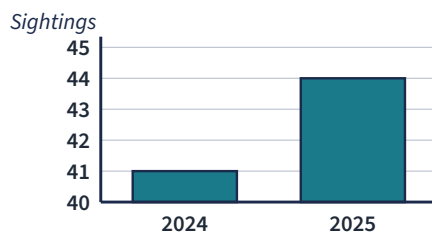
- 3 **Always, sometimes or never true?** “Changing the scale on the vertical axis changes the data.” Explain. [2 marks]

Circle one: **Always** / **Sometimes** / **Never**

- 4 Both graphs show the hours of sunshine on one day in Perth and Melbourne. What is the **same** and what is **different**? Which graph is misleading? [2 marks]



- 5 A newspaper headline says **SHARK SIGHTINGS SOAR!** above this graph. Why might the newspaper have drawn the graph this way? What really changed? [2 marks]



D

Challenge *stretch yourself*

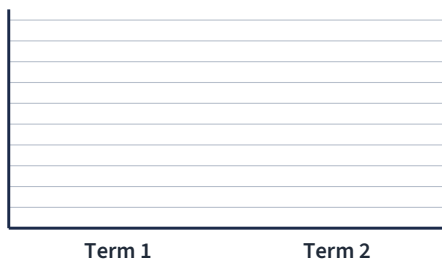
/ 9 marks

- 1 On a column graph the axis starts at **40**, and every **1 cm** up the axis stands for **5 votes**. Column A is **2 cm** tall and column B is **6 cm** tall. **a)** How many votes did each get? **b)** B's column is 3 times as tall as A's. How many times as many votes did B **really** get? **c)** If the axis started at 0, how tall would each column be? [3 marks]

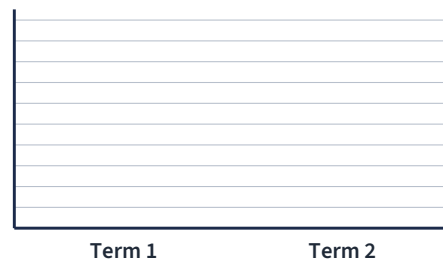
Answer: _____

- 2 The school recycled **60 kg** in Term 1 and **66 kg** in Term 2. On the left, draw a graph that makes the rise look **huge**. On the right, draw an **honest** graph. Write numbers on each axis. [3 marks]

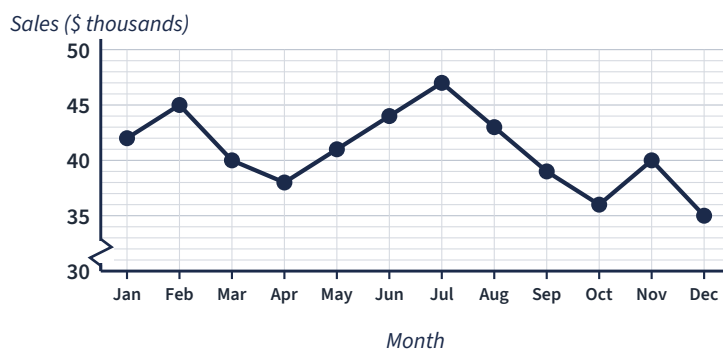
Looks huge



Honest



- 3 The graph shows a shop's monthly sales. **a)** An advert will show just **three months in a row**, and the line must go **up** the whole way. Find **all** the choices. **b)** Name three months in a row that would make sales look like they are **falling**. **c)** What is the **true** trend over the whole year? [3 marks]



How did I go?

Warm up ____ / 16 Practise ____ / 23 Think it through ____ / 10 Challenge ____ / 9 **Total** ____ / 58

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