

Pictograms, Bar Charts and Vertical Line Charts

Solutions

For AQA GCSE Mathematics (8300) • Foundation tier

Each question is shown in grey, followed by the working, one step per line. The final answer is in a box. *Marks* shows how the marks are usually given in the exam, and **Tip** points out a common mistake.

1 (1 mark)

In a vertical line chart, what does the height of each line show?

Circle your answer.

Options: the value, the frequency, the total, the range

In a vertical line chart, each value (or category) goes along the horizontal axis.

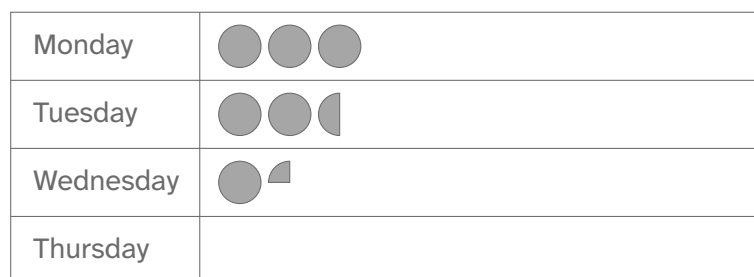
The height of the line above it is read from the vertical axis.

That is how many times the value occurs: the frequency.

Answer: the frequency

2 (3 marks)

The pictogram shows the number of cars sold by a garage on four days.



Key:  represents 4 cars

- (a) How many cars were sold on Monday?

Each circle represents 4 cars.

Monday has 3 circles.

$$3 \times 4 = 12$$

Answer: 12

- (b) How many cars were sold on Wednesday?

Wednesday has 1 whole circle and a quarter of a circle.

A whole circle = 4 cars.

A quarter of a circle = $4 \div 4 = 1$ car.

$$4 + 1 = 5$$

Answer: 5

Tip: Work out what a part-symbol is worth from the key: a quarter of 4 is 1, a half is 2, three-quarters is 3.

- (c) 14 cars were sold on Thursday.
Complete the pictogram.

$$14 \div 4 = 3\frac{1}{2}$$

So draw 3 whole circles and a half circle.

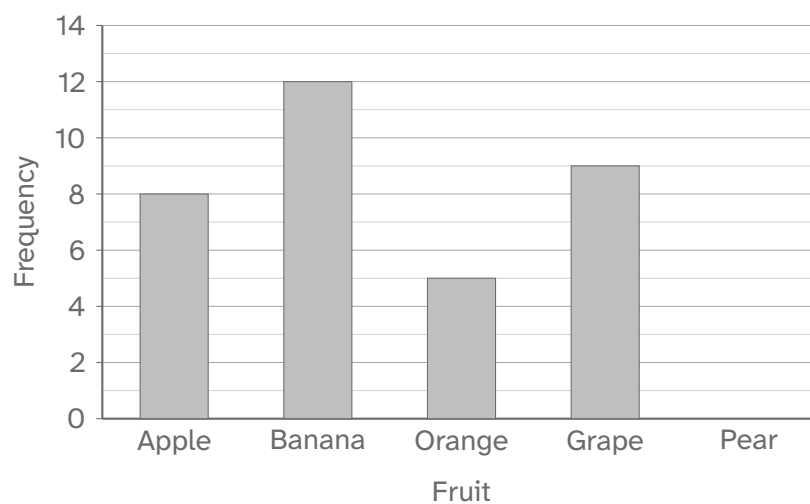
Monday	● ● ●
Tuesday	● ● ◐
Wednesday	● ◐
Thursday	● ● ● ◐

Key: ● represents 4 cars

Answer: 3 full circles and a half circle

3 (3 marks)

Some students were asked to choose their favourite fruit.
The bar chart shows some of the results.



(a) How many more students chose banana than orange?

Banana: 12

Orange: 5

$$12 - 5 = 7$$

Answer: 7

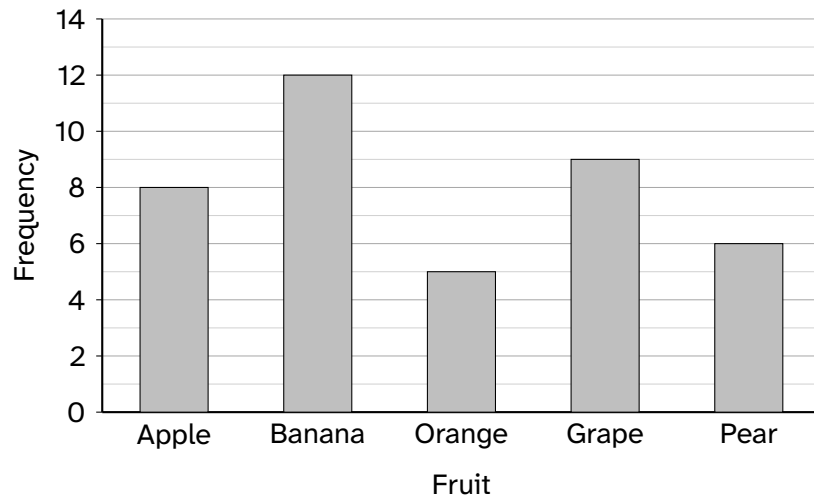
(b) 40 students were asked altogether.

Draw the bar for pear.

Read the other bars: $8 + 12 + 5 + 9 = 34$

Pear: $40 - 34 = 6$

Draw a bar of height 6, the same width as the others.



Answer: Bar of height 6

Tip: Each small square on this scale is 1. Read each bar carefully: a misread bar gives the wrong total.

Marks: 1 mark for working out 6. 1 mark for the bar drawn correctly.

4 (2 marks)

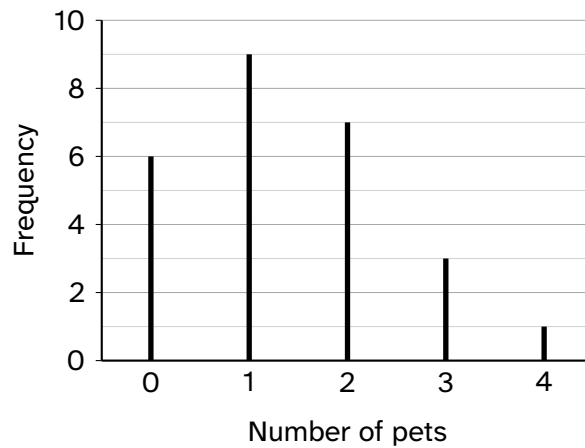
The table shows the number of pets owned by some students.

Number of pets	0	1	2	3	4
Frequency	6	9	7	3	1

Draw a vertical line chart to show the data.

Draw a thin vertical line (not a bar) above each number of pets.

The height of each line is the frequency: 6, 9, 7, 3, 1

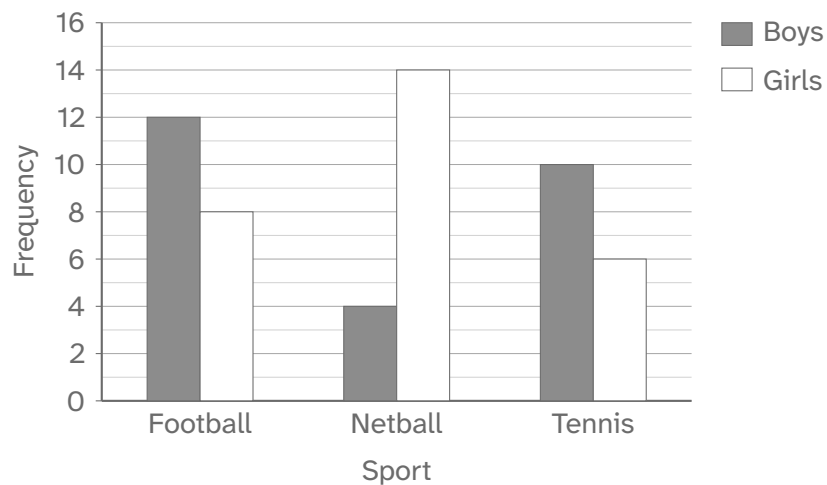


Answer: Lines of heights 6, 9, 7, 3, 1

Marks: 2 marks for all five lines correct. 1 mark for three correct.

5 (3 marks)

The dual bar chart shows the favourite sport of some boys and girls.



(a) Which sport was chosen by more girls than boys?

Compare the two bars for each sport.

Football: boys 12, girls 8

Netball: boys 4, girls 14

Tennis: boys 10, girls 6

Only netball has more girls than boys.

Answer: Netball

(b) How many students were asked altogether?

Boys: $12 + 4 + 10 = 26$

Girls: $8 + 14 + 6 = 28$

Total: $26 + 28 = 54$

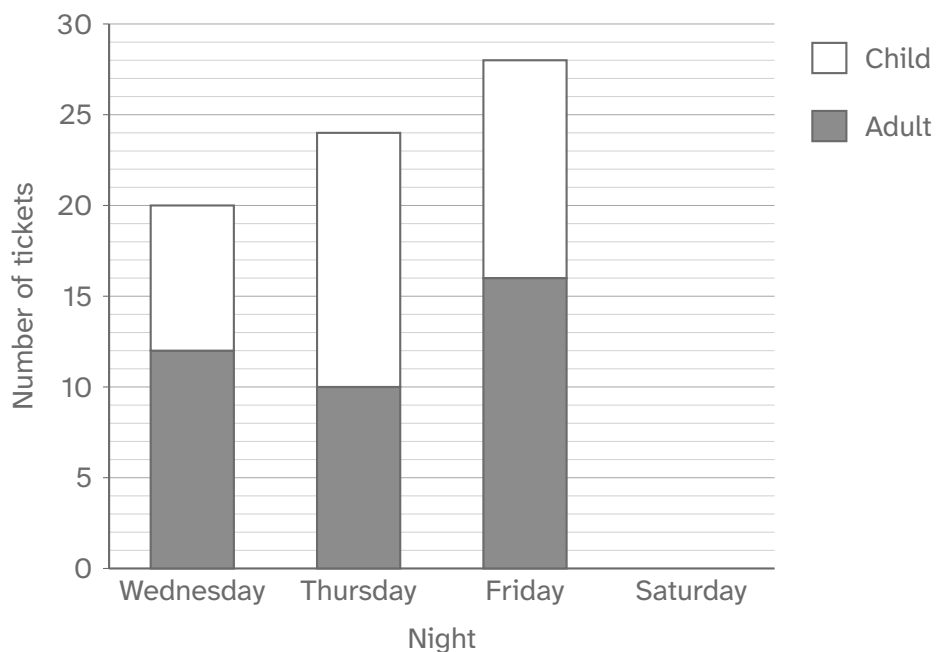
Answer: 54

Marks: 1 mark for adding all six values. 1 mark for 54.

6 (5 marks)

A school play was performed on four nights.

The composite bar chart shows the number of adult and child tickets sold on three of the nights.



(a) How many child tickets were sold on Thursday?

Child tickets are the top section of each bar.

On Thursday the child section starts at 10 and ends at 24.

$$24 - 10 = 14$$

Answer: 14

Tip: In a composite bar chart, the top section does not start at 0. Subtract where it starts from where it ends.

- (b) On which night were the most tickets sold altogether?

The total for each night is the top of the whole bar.

Wednesday 20, Thursday 24, Friday 28

Answer: Friday

- (c) How many more adult tickets were sold on Friday than on Wednesday?

Adult tickets are the bottom section.

Friday: 16 and Wednesday: 12

$$16 - 12 = 4$$

Answer: 4

- (d) On Saturday

24 tickets were sold

there were 3 times as many child tickets as adult tickets.

Show this information on the bar chart.

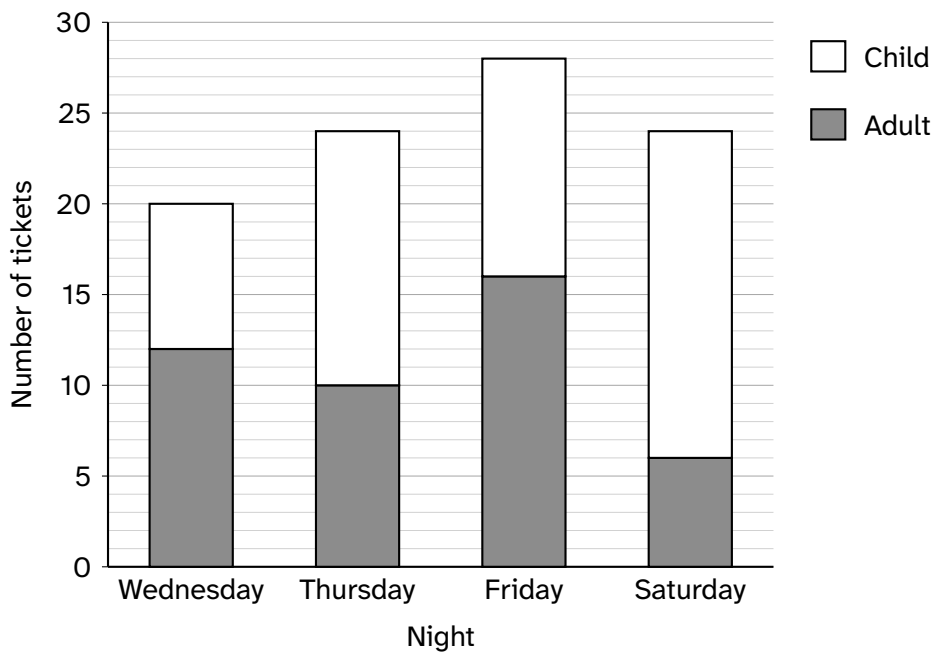
For every 1 adult ticket there were 3 child tickets: 4 tickets in each group.

$$24 \div 4 = 6, \text{ so } 6 \text{ adult tickets.}$$

$$\text{Child tickets: } 3 \times 6 = 18$$

$$\text{Check: } 6 + 18 = 24 \quad \checkmark$$

Adult section: from 0 to 6. Child section: from 6 to 24, on top.



Answer: Adult 0 to 6, child 6 to 24

Tip: Do not split 24 into 3 parts. “3 times as many” means 1 part adult and 3 parts child, so 4 parts in total.

Marks: 1 mark for 6 adult or 18 child tickets. 1 mark for a fully correct bar.

7 (4 marks)

A café sold 65 cakes altogether from Monday to Friday.

The pictogram (key: 1 circle represents 4 cakes) shows the cakes sold on Monday (3 circles), Tuesday ($2\frac{1}{2}$ circles) and Wednesday (4 circles).

On Thursday the café sold twice as many cakes as on Friday.

Complete the pictogram for Thursday and Friday.

Each circle represents 4 cakes.

Monday: $3 \times 4 = 12$ cakes

Tuesday: $2\frac{1}{2} \times 4 = 10$ cakes

Wednesday: $4 \times 4 = 16$ cakes

Total so far: $12 + 10 + 16 = 38$ cakes

Thursday and Friday together: $65 - 38 = 27$ cakes

Thursday is twice Friday, so split 27 into 3 equal parts: $27 \div 3 = 9$

Friday = 9 cakes and Thursday = $2 \times 9 = 18$ cakes

Check: $18 + 9 = 27$ ✓

Thursday: $18 \div 4 = 4\frac{1}{2}$ circles

Friday: $9 \div 4 = 2\frac{1}{4}$ circles

Monday	
Tuesday	
Wednesday	
Thursday	
Friday	

Key:  represents 4 cakes

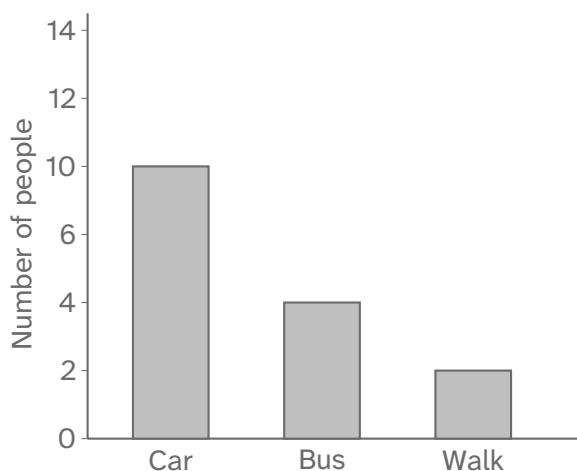
Answer: Thursday $4\frac{1}{2}$ circles, Friday $2\frac{1}{4}$ circles

Tip: Don't just halve 27. Thursday is **twice** Friday, so there are 3 equal parts: 1 for Friday and 2 for Thursday.

Marks: 1 mark for 12, 10 and 16 (or 38). 1 mark for $65 - 38 = 27$. 1 mark for Thursday 18 and Friday 9. 1 mark for both rows drawn correctly.

8 (2 marks)

Noor asked some people how they travel to work.
Each person said car, bus, train or walk.
She draws this bar chart.



Make **two** criticisms of her bar chart.

Any two of these:

The vertical scale is not even: it goes 0, 2, 4, 6 and then jumps to 10.

There is no bar for train. Train was one of the answers, so it should be on the chart (even if its frequency is 0).

The horizontal axis has no label.

Answer: Uneven vertical scale (6 to 10); no bar for train; no horizontal axis label

Tip: Be exact. Say the scale jumps from 6 to 10, not just “the scale is wrong”. Check every category in the question has a bar.

Marks: 1 mark for each different criticism.

9 (1 mark)

The bar chart shows the number of televisions sold by two shops.



Give a reason why the bar chart is misleading.

The vertical axis starts at 40, not 0.

Shop A sold 50 and shop B sold 65.

But shop B's bar looks two and a half times as tall as shop A's.

So the difference looks much bigger than it really is.

Answer: The vertical axis does not start at 0