

Exercise walk-through

C9.4

Statistical charts and diagrams

IGCSE Mathematics

You must be able to

- Choose and construct appropriate statistical charts
- Calculate pie angles and interpret pictogram keys
- Include ordered stem-and-leaf entries, keys and legends

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The method

Method — Key knowledge: Statistical charts and diagrams

Bar charts use equal-width separated bars; frequency is shown by height. A dual bar chart compares groups side by side; a stacked chart adds their components vertically. A pie-chart angle is $\theta = (f/N)360^\circ$. A pictogram key gives the amount per symbol, including half-symbols. A stem-and-leaf diagram orders leaves and includes a key showing place value. Simple frequency distributions give counts for each value.

Exercises 2.1·2.3

2.1 A pictogram uses one symbol for 8 books. How many books do 2.5 symbols represent? [2]

2.2 A category has frequency 15 out of 60. Find its pie-chart angle. [2]

2.3 Make an ordered stem-and-leaf diagram for 23, 17, 21, 14, 17. Include a key. [2]

Exercises 2.1·2.3

2.1 A pictogram uses one symbol for 8 books. How many books do 2.5 symbols represent? [2]

2.1

- $N = 2.5(8) = \mathbf{20}$ books.

2.2 A category has frequency 15 out of 60. Find its pie-chart angle. [2]

2.2

- $\theta = (15/60)360 = \mathbf{90^\circ}$.

2.3 Make an ordered stem-and-leaf diagram for 23, 17, 21, 14, 17. Include a key. [2]

2.3

- Stem 1: leaves 4,7,7; stem 2: leaves 1,3; key $1|4 = 14$.

Exercise 2.4

2.4 A stacked bar has 12 red and 9 blue items. State its total height if one unit represents one item. [2]

3 Exam-style questions

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3 Exam-style questions

2.4

- Add components: $H = 12 + 9 = \mathbf{21}$ units.

Exercise 3.1 (a)

3.1 Apply the statistical charts and diagrams methods below. Show working and include units where appropriate.

(a) A survey has walk 12, cycle 8 and bus 20. Find the total and all three pie-chart angles. [2]

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(a)

- $N = 40; \theta_W = 108^\circ, \theta_C = 72^\circ, \theta_B = 180^\circ$.

Exercise 3.1 (b)

3.1 Apply the statistical charts and diagrams methods below. Show working and include units where appropriate.

(b) Draw a pie chart using these angles and label its sectors.

[2]

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3.1 Apply the statistical charts and diagrams methods below. Show working and include units where appropriate.

(b) Draw a pie chart using these angles and label its sectors. [2]

(b)

- **Three labelled sectors of 108° , 72° , 180°** , drawn with a protractor.

Exercise 3.1 (c)

3.1 Apply the statistical charts and diagrams methods below. Show working and include units where appropriate.

(c) A second class has walk 10, cycle 14 and bus 16. Draw a dual bar chart comparing both classes. [2]

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(c) A second class has walk 10, cycle 14 and bus 16. Draw a dual bar chart comparing both classes. [2]

(c)

- **Paired bars of heights (12,10), (8,14), (20,16)** for walk, cycle, bus; equal widths, common frequency scale and a class legend.

Exercise 3.2 (a)

3.2 A pictogram represents 30 walkers by 3 full symbols and three quarters of a symbol.

(a) Find the number represented by one full symbol. A bus group has 20 pupils and a cycling group has 10. Find the pie-chart angles for all three groups. [3]

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(a)

- One symbol represents $k = 30/3.75 = 8$ pupils.
- Total is 60 pupils, so angles are **180°, 120°, 60°** for walkers, bus, cyclists respectively.
- Their sum is 360°.

Exercise 3.2 (b)

3.2 A pictogram represents 30 walkers by 3 full symbols and three quarters of a symbol.

(b) Journey times are 12, 17, 12, 23, 21, 17 minutes. Draw an ordered stem-and-leaf diagram with a key and read its median. [3]

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(b) Journey times are 12, 17, 12, 23, 21, 17 minutes. Draw an ordered stem-and-leaf diagram with a key and read its median. [3]

(b)

- Stem 1 has ordered leaves **2, 2, 7, 7**; stem 2 has **1, 3**.
- Key **1 | 2 = 12 minutes**.
- Middle values are 17 and 17, so median **17 minutes**.