

C9.4 Statistical charts and diagrams

Name: _____ Class: _____ Date: _____ **Total: 20 marks**

KEY WORDS stem-and-leaf diagram 茎叶图 • bar chart 条形图 • pictogram 象形图
• frequency distribution 频数分布 • pie chart 饼图

Objective

Use statistical charts and diagrams to solve Core IGCSE Mathematics problems.

You must be able to:

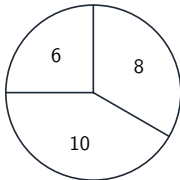
- Choose and construct appropriate statistical charts
- Calculate pie angles and interpret pictogram keys
- Include ordered stem-and-leaf entries, keys and legends

1 Key knowledge and worked examples

■ **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.

■ **Worked example: Statistical charts and diagrams**



24 students; counts in sectors

Of 24 students, 6 cycle, 10 walk and 8 take a bus.

- Pie angles: $\theta_C = (6/24)360 = 90^\circ$, $\theta_W = 150^\circ$, $\theta_B = 120^\circ$; check they sum to 360.
- If each pictogram symbol means 4 students, 6 students need $s = 6/4 = 1.5$ symbols.
- Data 12, 15, 15, 21 become stem 1 with leaves 2,5,5 and stem 2 with leaf 1; key $1|2 = 12$.
- A dual bar chart puts two labelled bars per category; its legend identifies each

group.

■ **Method check**

A chart key carries numerical meaning. Pie sectors describe proportions; stem-and-leaf diagrams retain individual values and need a key.

2 Practice

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]

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

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]

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

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

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]

(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]