

E9.1 Classifying statistical data

Name: _____ Class: _____ Date: _____

Total: 11 marks

KEY WORDS qualitative 定性的 • quantitative 定量的 • discrete 离散的 • continuous 连续的
• population 总体

Objective

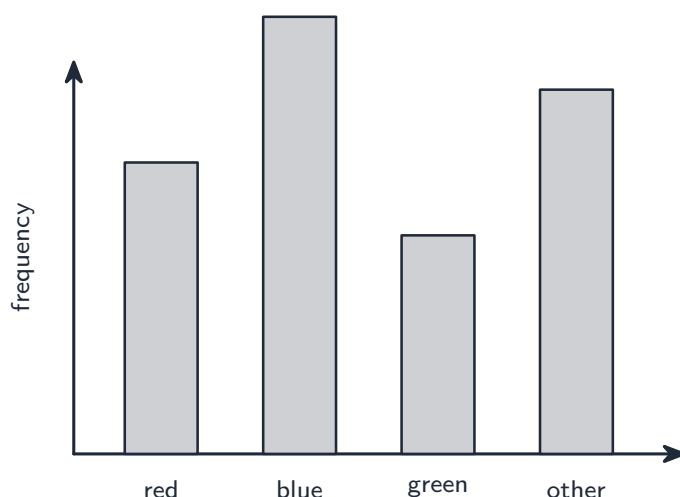
Build the skills to answer Extended exam questions on **classifying statistical data** 统计数据的分类 — telling **qualitative** 定性 from **quantitative** 定量 data, **discrete** 离散 from **continuous** 连续 data, and knowing why **grouped** 分组 classes for continuous data are written with inequalities.

You must be able to:

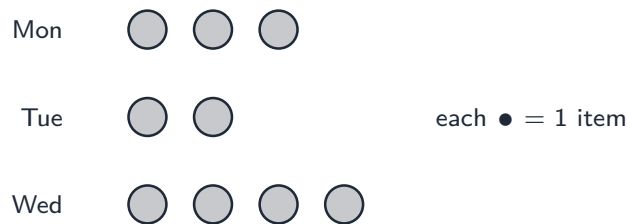
- classify a variable as qualitative, discrete quantitative or continuous quantitative
- explain why continuous data is grouped using inequalities with no gaps or overlaps
- distinguish a population from a sample

1 Worked examples

■ Can you count it, measure it, or only name it?



Qualitative data has categories, so its bars have gaps between them



Counted data is discrete: it comes in whole steps

- **Qualitative** data is a name or a category: eye colour, favourite sport, country.
- **Quantitative** data is a number, and splits in two: **discrete** is counted and lands on separate values (number of cars, shoe size), while **continuous** is measured and can take any value in a range (height, time, mass).
- **Grouping continuous data:** classes are written $0 < m \leq 10$, $10 < m \leq 20$ so there is **no gap and no overlap**. Writing 0–10, 11–20 would leave 10.4 with nowhere to go.
- **Population** is everyone or everything being studied; a **sample** is the smaller part actually measured.

Answer shapes (marked by **method marks** — M1 for a correct method, A1 for the correct answer): these are B marks for precise words. “Continuous quantitative” earns more than “numbers”.

2 Practice

2.1 State whether shoe size is discrete or continuous. [1]

2.2 State whether the height of a plant is discrete or continuous. [1]

2.3 State whether eye colour is qualitative or quantitative. [1]

3 Exam-style questions

3.1 Classify each of the following as qualitative, discrete quantitative or continuous quantitative.

(a) The number of cars in a car park. [1]

(b) The time taken to run 100 m. [1]

(c) A student's favourite sport. [1]

3.2 A set of masses m grams is grouped as $0 < m \leq 10$, $10 < m \leq 20$, and so on.

(a) Explain why the classes are written with inequalities rather than as 0–10, 11–20. [2]

(b) State which class a mass of exactly 10 g belongs to. [1]

3.3 Explain the difference between a population and a sample. [2]

Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

- shoe sizes come in separate steps and are counted, not measured

discrete

2.2

- height can take any value within a range

continuous

2.3

- it is a category, not a number

qualitative

3.1

- (a) **discrete quantitative**
- (b) **continuous quantitative**
- (c) **qualitative**

3.2

(a)

- mass is continuous, so a value such as 10.4 g is possible
- 0–10 and 11–20 would leave a gap between them with nowhere for such a value to go; the inequalities leave no gap and no overlap

(b)

- the first class ends with ≤ 10 , so it includes exactly 10

$$0 < m \leq 10$$

3.3

- a population is EVERY member of the group being studied
- a sample is the smaller part of it that is actually measured, chosen to represent the whole