

1.5 Representing a Quantitative Variable with Graphs

Name: _____ Class: _____ Date: _____ **Total: 9 marks**

KEY WORDS histogram 直方图 • bins 组距
• cumulative relative frequency graph 累积相对频数图 • dotplot 点图 • stem-and-leaf plot 茎叶图

Objective

Build the skills to answer exam questions on **representing a quantitative variable with graphs**.

You must be able to:

- display a quantitative variable with a **histogram** 直方图, **dotplot** 点图, or **stem-and-leaf plot** 茎叶图
- choose an appropriate number of **bins** 组距 for a histogram
- use a **cumulative relative frequency graph** 累积相对频数图 (ogive) to estimate percentiles

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ **Graphs for quantitative data**
A **histogram**, **dotplot**, or **stem-and-leaf plot** shows the distribution of a numerical variable.

■ **Bins**
A histogram groups values into **bins** (intervals). Too few bins hide the shape; too many make it look choppy — choose enough to reveal the shape.

■ **Ogive**
A **cumulative relative frequency graph** (ogive) rises to 1 and lets you read off **percentiles**.

2 Practice

2.1 Name two graphs for a quantitative variable. [2]

2.2 State what the bins of a histogram are. [1]

2.3 State what an ogive is used to estimate. [1]

3 Exam-style questions

3.1 A graph for a quantitative variable is a [1]

- A bar chart
- B pie chart
- C histogram
- D two-way table

3.2 A cumulative relative frequency graph (ogive) is used to estimate [1]

- A the mode
- B percentiles
- C categories
- D colours

3.3 Data on exam marks is to be displayed.

- (a) Name a suitable graph. [1]
(b) State what using too few bins might hide. [1]
(c) Name the graph used to read percentiles. [1]

Solutions

2.1 any two of: histogram, dotplot, stem-and-leaf plot.

2.2 the intervals into which the values are grouped.

2.3 percentiles.

3.1 C.

3.2 B.

3.3 (a) a histogram (or dotplot). (b) the shape of the data. (c) an ogive (cumulative relative frequency graph).