

# 5.1 Introducing Statistics: Why Is My Sample Not Like Yours?

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

Total: 9 marks

KEY WORDS statistic 统计量 • parameter 参数 • sampling variability 抽样变异性

## Objective

Build the skills to answer exam questions on **why samples differ**.

You must be able to:

- describe **sampling variability** 抽样变异性
- distinguish a **statistic** 统计量 (describes a sample) from a **parameter** 参数 (describes a population)
- explain why different samples give different statistics

## 1 Worked examples

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

### ■ Sampling variability

Different random samples from the same population give **different** values of a statistic — this is **sampling variability**.

### ■ Statistic vs parameter

- A **statistic** (like  $\bar{x}$  or  $\hat{p}$ ) is computed from a **sample** and varies.
- A **parameter** (like  $\mu$  or  $p$ ) is a fixed number describing the whole **population**.

## 2 Practice

2.1 Define sampling variability.

[1]

2.2 State the difference between a statistic and a parameter.

[2]

**2.3** State why two random samples give different means. [1]

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### 3 Exam-style questions

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**3.1** A number describing a sample is a [1]

- **A** parameter
  - **B** statistic
  - **C** population
  - **D** census
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**3.2** A number describing a population is a [1]

- **A** statistic
  - **B** parameter
  - **C** sample
  - **D** residual
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**3.3** Two students each survey 50 people and get different sample proportions.

(a) Name the reason for the difference. [1]

(b) Name the value computed from each sample. [1]

(c) Name the fixed population value. [1]

## Solutions

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**2.1** the natural variation in a statistic from one random sample to another.

**2.2** a statistic describes a sample and varies; a parameter describes the population and is fixed.

**2.3** each sample contains different individuals (sampling variability).

**3.1** B.

**3.2** B.

**3.3** (a) sampling variability. (b) a statistic. (c) a parameter.