

3.7 Inference and Experiments

Name: _____ Class: _____ Date: _____ **Total: 8 marks**

KEY WORDS statistically significant 统计显著 • random assignment 随机分配
• random selection 随机选取 • experiment 实验 • population 总体

Objective

Build the skills to answer exam questions on **inference and experiments**.

You must be able to:

- explain that **random assignment** 随机分配 allows a **cause-and-effect** conclusion
- explain that **random selection** 随机选取 allows **generalization** to a population
- describe when a difference is **statistically significant** 统计显著

1 Worked examples

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

■ **Two kinds of randomness**

- **Random assignment** of units to treatments lets you conclude **cause and effect**.
- **Random selection** of units from a population lets you **generalize** the results to that population.

■ **Statistical significance**

A difference between groups is **statistically significant** when it is **too large to be explained by chance alone**.

2 Practice

2.1 State what random assignment allows you to conclude. [1]

2.2 State what random selection allows. [1]

2.3 Define a statistically significant difference. [1]

3 Exam-style questions

3.1 Random assignment to treatments allows a conclusion about [1]

- | | |
|---|---|
| A | B |
| C | D |
- A generalization
 - B cause and effect
 - C the population size
 - D bias

3.2 A result is statistically significant if it is [1]

- | | |
|---|---|
| A | B |
| C | D |
- A small
 - B unlikely to be due to chance alone
 - C biased
 - D perfectly random

3.3 An experiment randomly assigns treatments and finds a large difference between the groups.

- (a) State what random assignment allows. [1]
- (b) State what random selection of units would allow. [1]
- (c) State what “statistically significant” means. [1]