Exercise walk-through

Concluding a Test for a Population Proportion ▪ 6.6

eXercise

You must be able to

- compare the **p-value** to the **significance level** 显著性水平 α
- decide to **reject** or **fail to reject** H_0
- state a conclusion in context

Method — The decision rule

Compare the p-value to α (often 0.05):

- if p-value $< \alpha \rightarrow$ **reject** H_0 (the result is statistically significant);
- if p-value $\geq \alpha \rightarrow$ **fail to reject** H_0.

Method — In context

"Reject H_0" means there is convincing evidence for H_a; "fail to reject" means there is **not** enough evidence — never "accept H_0".

Practice 2.1 ▪ 1 mark

State the decision rule using the p-value and α.

Solution 2.1

Method: The decision rule

Worked steps

reject H_0 if the p-value $< \alpha$; otherwise fail to reject H_0 (B1).

Practice 2.2 ▪ 1 mark

A test has a p-value of 0.03 and $\alpha = 0.05$. State the decision.

Solution 2.2

Method: The decision rule

Worked steps

reject H_0 $(0.03 < 0.05)$ B1.

Practice 2.3 ▪ 1 mark

State what "fail to reject H_0" means.

Solution 2.3

Method: In context

Worked steps

there is not enough evidence to reject H_0 B1.

Exam-style 3.1 ▪ 1 mark

If the p-value is less than α, you

A reject H_0

B accept H_0

C fail to reject H_0

D do nothing

Solution 3.1

A reject H_0 ✓

B accept H_0

C fail to reject H_0

D do nothing

Worked steps

A.

Exam-style 3.2 ▪ 1 mark

A test with p-value 0.10 and $\alpha = 0.05$ leads to

A rejecting H_0

B failing to reject H_0

C an error

D bias

Solution 3.2

A rejecting H_0

B failing to reject H_0 ✓

C an error

D bias

Worked steps

B.

Exam-style 3.3 ▪ 1 mark

A test of $p \neq 0.5$ gives a p-value of 0.01 at $\alpha = 0.05$.
(a) State the decision.
(b) State whether the result is statistically significant.
(c) State the conclusion in context.

Solution 3.3

Method: The decision rule

Worked steps

(a) reject H_0 B1. (b) yes B1. (c) there is convincing evidence that $p \neq 0.5$ B1.