AP STATISTICS • EXERCISE SHEET

6.6 Concluding a Test for a Population Proportion

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

Objective

Build the skills to answer exam questions on **concluding a test for a proportion**.

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

1 Worked examples

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

■ 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.

■ 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".

2 Practice

2.1 State the decision rule using the p-value and α. [1]

2.2 A test has a p-value of 0.03 and $\alpha = 0.05$. State the decision. [1]

2.3 State what "fail to reject H_0" means. [1]

3 Exam-style questions

3.1 If the p-value is less than α, you [1]

- **A** reject H_0
- **B** accept H_0
- **C** fail to reject H_0
- **D** do nothing

3.2 A test with p-value 0.10 and $\alpha = 0.05$ leads to [1]

- **A** rejecting H_0
- **B** failing to reject H_0
- **C** an error
- **D** bias

3.3 A test of $p \neq 0.5$ gives a p-value of 0.01 at $\alpha = 0.05$.

(a) State the decision. [1]

(b) State whether the result is statistically significant. [1]

(c) State the conclusion in context. [1]

4 Go further

- work through the **6.6 Concluding a Test for a Population Proportion** lesson on the **Learn** page;
- read the **Inference for Categorical Data: Proportions** section of the AP Statistics handout on the **Know** page.

Solutions

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

2.2 reject H_0 ($0.03 < 0.05$).

2.3 there is not enough evidence to reject H_0.

3.1 A.

3.2 B.

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