

6.5 Interpreting p-Values

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

KEY WORDS p-value P 值 • null hypothesis 原假设

Objective

Build the skills to answer exam questions on **interpreting p-values**.

You must be able to:

- define a **p-value** as the probability of a result at least as extreme, **assuming H_0 is true**
- explain that a **small** p-value is evidence **against H_0**

1 Worked examples

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

■ What a p-value is

The **p-value** is the probability of getting a sample result **as extreme or more extreme** than the one observed, **assuming the null hypothesis is true**.

■ Interpreting it

- A **small** p-value means the observed data would be unlikely if H_0 were true → **evidence against H_0** .
- A **large** p-value means the data are consistent with H_0 .

2 Practice

2.1 Define a p-value. [1]

2.2 State what a small p-value suggests. [1]

2.3 State the assumption made when computing a p-value. [1]

3 Exam-style questions

3.1 A p-value is computed assuming [1]

- A H_a is true
- B H_0 is true
- C the sample is biased
- D nothing

3.2 A small p-value gives evidence [1]

- A for H_0
- B against H_0
- C of bias
- D of nothing

3.3 A test gives a p-value of 0.02.

(a) State what this value measures. [1]

(b) State whether it is strong or weak evidence against H_0 . [1]

(c) State the assumption behind it. [1]

Solutions

2.1 the probability of a result at least as extreme as the one observed, assuming H_0 is true.

2.2 evidence against H_0 .

2.3 that the null hypothesis is true.

3.1 B.

3.2 B.

3.3 (a) the probability of a result this extreme if H_0 is true. (b) strong. (c) that H_0 is true.