AP STATISTICS • EXERCISE SHEET

6.5 Interpreting p-Values

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

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]

4 Go further

- work through the **6.5 Interpreting p-Values** 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 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.