

Exercise walk-through

Interpreting p-Values ■ 6.5

eXercise

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**

Method — 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**.

Method — 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 .

Practice 2.1 ■ 1 mark

Define a p-value.

Solution 2.1

Worked steps

the probability of a result at least as extreme as the one observed, assuming H_0 is true **B1**.

Practice 2.2 ■ 1 mark

State what a small p-value suggests.

Solution 2.2

Worked steps

evidence against H_0 **B1**.

Practice 2.3 ■ 1 mark

State the assumption made when computing a p-value.

Solution 2.3

Worked steps

that the null hypothesis is true **B1**.

Exam-style 3.1 ■ 1 mark

A p-value is computed assuming

A H_a is true

B H_0 is true

C the sample is biased

D nothing

Solution 3.1

A H_a is true

B H_0 is true



C the sample is biased

D nothing

Worked steps

B.

Exam-style 3.2 ■ 1 mark

A small p-value gives evidence

A for H_0

B against H_0

C of bias

D of nothing

Solution 3.2

Method: Interpreting it

A for H_0

B against H_0



C of bias

D of nothing

Worked steps

B.

Exam-style 3.3 ■ 1 mark

A test gives a p-value of 0.02.

- (a) State what this value measures.
- (b) State whether it is strong or weak evidence against H_0 .
- (c) State the assumption behind it.

Solution 3.3

Method: Interpreting it

Worked steps

(a) the probability of a result this extreme if H_0 is true **B1**. (b) strong **B1**. (c) that H_0 is true **B1**.