AP STATISTICS • EXERCISE SHEET

6.3 Justifying a Claim Based on a Confidence Interval for a Population Proportion

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

Objective

Build the skills to answer exam questions on **justifying a claim from a confidence interval for a proportion**.

You must be able to:

- use a confidence interval to judge whether a claimed value is **plausible**
- recognise that a value **inside** the interval is plausible and one **outside** is not supported
- state the meaning of the confidence level

1 Worked examples

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

Using a confidence interval to judge a claim

A confidence interval gives the plausible values of p:

- if a claimed value is **inside** the interval, the claim is **plausible**;
- if it is **outside**, the data do **not support** that claim.

Example

A 95% interval of $(0.52, 0.58)$ does **not** contain 0.5, so "$p = 0.5$" is not supported, but "a majority ($p > 0.5$)" is plausible.

2 Practice

2.1 State how a confidence interval can be used to judge a claim. [1]

2.2 A 95% CI for p is $(0.45, 0.55)$. State whether the claim "$p = 0.5$" is plausible. [1]

2.3 State what it means if a claimed value lies outside the interval. [1]

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3 Exam-style questions

3.1 A claimed value that lies inside a confidence interval is [1]

- **A** rejected
- **B** plausible
- **C** impossible
- **D** certainly correct

3.2 A 95% CI for p is $(0.60, 0.70)$. A claim that $p = 0.50$ is [1]

- **A** plausible
- **B** not supported (it is outside the interval)
- **C** certainly true
- **D** unknown

3.3 A 95% CI for the proportion supporting a policy is $(0.52, 0.58)$.

(a) State whether "a majority ($p > 0.5$) support it" is plausible. [1]

(b) State whether $p = 0.5$ is inside the interval. [1]

(c) State the confidence level. [1]

4 Go further

- work through the **6.3 Justifying a Claim Based on a Confidence Interval** 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 a value inside the interval is plausible; a value outside is not supported by the data.

2.2 yes, plausible (0.5 is inside the interval).

2.3 the data do not support that claim.

3.1 B.

3.2 B.

3.3 (a) yes (the whole interval is above 0.5). (b) no. (c) 95%.