

AP Statistics - Inference for the Difference of Two Proportions - Test

Common Core AP STAT 6.8, AP STAT 6.9, AP STAT 6.10, AP STAT 6.11, HSS-IC.B.5 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

This 45-minute test covers conditions, confidence intervals, and hypothesis tests for a difference of two proportions. Follow State, Plan, Do, Conclude and write every conclusion in context.

About this test

- Grade: AP Statistics
- Chapter: Inference for the Difference of Two Proportions
- Standards: AP STAT 6.8, AP STAT 6.9, AP STAT 6.10, AP STAT 6.11, HSS-IC.B.5
- Time: 45 minutes
- Total: 20 points

Question 1 - Two-sample interval [4 pts]

	Success	Failure
Group X	84	116
Group Y	66	154

Results for two independent random samples.

Use the table (independent random samples, each under 10% of its population). (a) Check the large counts condition. (1 point) (b) Construct a 95% confidence interval for $p_X - p_Y$. (2 points) (c) Interpret the interval and say whether it suggests a difference. (1 point)

Question 2 - Two-sample test [4 pts]

With the same data, test $H_0: p_X = p_Y$ against $H_a: p_X \text{ not equal to } p_Y$ at $\alpha = 0.05$. Show the pooled proportion, z , p -value, and a conclusion in context. (4 points)

Question 3 - Hypotheses [2 pts]

	Improved	Not improved
Drug	56	24
Placebo	40	40

Randomized experiment results.

The table shows a randomized experiment. Define the parameters and write the hypotheses to test whether the drug helps a greater proportion.

Question 4 - Sample difference [1 pt]

Using the table in the previous question, find the sample proportion improved in each group.

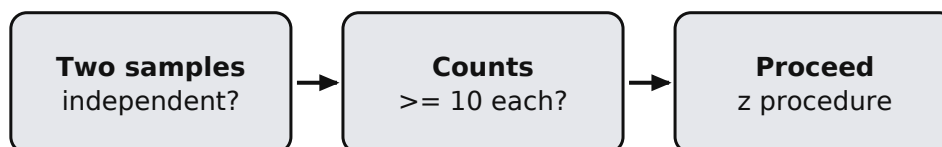
Question 5 - Error type [1 pt]

If the drug has no effect but the test rejects H_0 , what type of error was made?

Question 6 - Pooled or not [2 pts]

Explain why a test of $H_0: p_1 = p_2$ uses a pooled proportion while a confidence interval does not.

Question 7 - Conditions [3 pts]



Conditions.

A school surveys 40 randomly chosen sophomores (6 own an e-bike) and 50 randomly chosen seniors (14 own one). (a) Which condition fails? (2 points) (b) What could be done? (1 point)

Question 8 - Interpret the interval [3 pts]

A 95% confidence interval for $p_A - p_B$ is $(-0.04, 0.12)$. (a) Interpret in context where A and B are two bus routes' on-time proportions. (2 points) (b) Is there convincing evidence of a difference? (1 point)