

AP Statistics · Inference for Proportions · Quiz

Common Core AP Statistics Unit 3 (2026-27) · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

This ap statistics proportions quiz asks 10 multiple-choice questions on inference for proportions, and each answer comes with a short explanation.

Choose the best answer for each of the ten questions on inference for proportions. Several questions use a figure. Check each answer against the explanation to learn why the other options are tempting but wrong.

AP StatisticsCommon Core: AP Statistics Unit 3 (2026-27)

Questions

Question 1

A random sample of 300 students is taken from a school of 1,500 students to estimate a proportion. Which condition for inference is violated?

- A. The Random condition, since the school is small
- B. The 10% condition, since 300 is more than 10% of 1,500
- C. The Large Counts condition, since 300 is too large
- D. No condition is violated, since 300 is at least 30

Question 2

In a random sample of 200 adults, 124 own a pair of running shoes. What is the standard error of the sample proportion?

- A. 0.056
- B. 0.0012
- C. 0.034
- D. 0.485

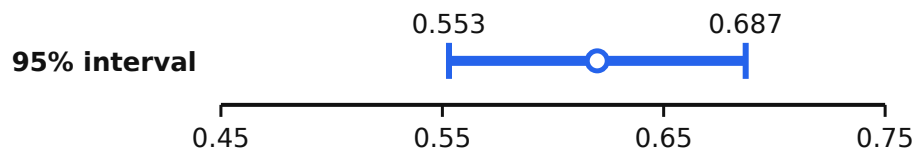
Question 3

Which critical value z^* is used for a 98% confidence interval for a proportion?

- A. 2.054
- B. 1.960
- C. 2.576
- D. 2.326

Question 4

The figure shows a 95% confidence interval for the proportion of students in a district who prefer a later school start. Which statement is a correct interpretation?



95% interval from a random sample of students.

- A. There is a 95% probability that a randomly chosen student prefers a later start
- B. We are 95% confident that the true proportion of students who prefer a later start is between 0.553 and 0.687
- C. 95% of students in the district have a preference between 0.553 and 0.687
- D. The true proportion is 0.620 with a margin of error of 95%

Question 5

A pollster plans to quadruple the sample size while keeping the same confidence level and the same expected sample proportion. What happens to the margin of error?

- A. It is cut to one-fourth
- B. It is doubled
- C. It stays the same
- D. It is cut in half

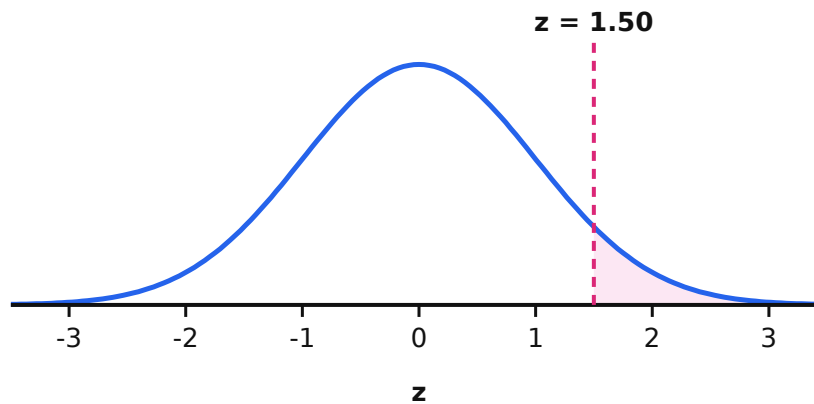
Question 6

What is the smallest sample size that gives a 95% confidence interval for a proportion with a margin of error of at most 0.04, if no prior estimate is available?

- A. 600
- B. 2,401
- C. 601
- D. 1,068

Question 7

A right-tailed z test gives $z = 1.50$, shown below. At the 0.05 significance level, what is the correct decision?

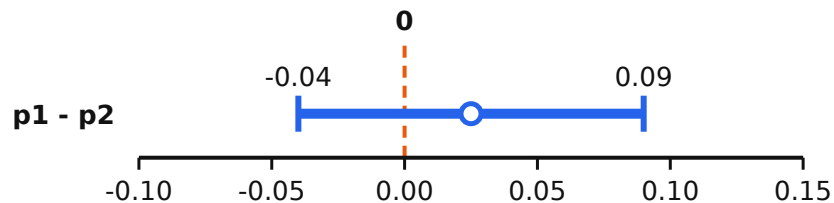


Shaded: the P-value for a right-tailed test with $z = 1.50$.

- A. Fail to reject H_0 , since the P-value 0.067 is greater than 0.05
- B. Reject H_0 , since $z = 1.50$ is greater than 1
- C. Reject H_0 , since the P-value 0.067 is less than 0.10
- D. Accept H_0 , since the P-value shows H_0 is true

Question 8

A 95% confidence interval for $p_1 - p_2$ is shown. What can be concluded?



A 95% interval for $p_1 - p_2$.

- A. There is convincing evidence that p_1 is larger, because most of the interval is positive
- B. There is not convincing evidence of a difference, because 0 is in the interval
- C. There is convincing evidence that p_1 and p_2 are equal
- D. There is convincing evidence of a difference, because the interval is narrow

Question 9

In a test of $H_0: p = 0.20$ versus $H_a: p > 0.20$, what is a Type I error?

- A. Concluding p is greater than 0.20 when p is actually 0.20
- B. Concluding p is 0.20 when p is actually greater than 0.20
- C. Failing to reject H_0 when p is greater than 0.20
- D. Rejecting H_0 when the P-value is greater than the significance level

Question 10

Which change increases the power of a significance test for a proportion, if the other factors

stay the same?

- A. Increasing the sample size
- B. Decreasing the significance level
- C. Choosing an alternative value closer to p_0
- D. Using a smaller sample with the same alpha

Answer key

1. **B** – When sampling without replacement, n must be at most 10% of the population; 10% of 1,500 is 150, and 300 exceeds it.
2. **C** – $SE = \sqrt{0.62 \times 0.38 / 200} = 0.034$. Forgetting the factor $1 - \hat{p}$ gives 0.056, and omitting the square root gives 0.0012.
3. **D** – A 98% interval leaves 1% in each tail, so $z^* = 2.326$. The value 2.576 is for 99%, and 1.960 is for 95%.
4. **B** – The confidence level refers to the method's capture rate for the true proportion. Intervals do not describe individual students or give a probability for p .
5. **D** – The margin of error is proportional to 1 divided by the square root of n . Four times the sample size gives half the margin of error.
6. **C** – $n = (1.960/0.04)^2 (0.5)(0.5) = 600.25$, which must be rounded up to 601. The value 2,401 omits $p(1 - p)$, and 1,068 is for a margin of error of 0.03.
7. **A** – The P-value is $P(Z > 1.50) = 0.067$, which is larger than 0.05, so we fail to reject H_0 . Failing to reject does not prove H_0 is true.
8. **B** – Since 0 is a plausible value for the difference, the data do not show a difference. A result that fails to find a difference does not show the proportions are equal.
9. **A** – A Type I error rejects a true null hypothesis. The second and third options describe a Type II error, and rejecting with a large P-value is a decision mistake, not an error type.
10. **A** – A larger sample reduces the standard deviation of the sampling distribution, making real differences easier to detect. Lowering α or moving the alternative closer to p_0 reduces power.

How does this quiz work?

Read each question, choose one answer among A, B, C and D, then check it: a short explanation appears after every answer. Your score out of 10 is shown at the end, and you can restart the quiz as often as you like.

What should you review before the quiz?

Reread the key facts of the lesson and the worked example. If a question is hard, go back to the matching part of the lesson, then try the quiz again. Write your work on scrap paper: most mistakes come from skipping a step, not from the idea itself.

Remember:

- Check three conditions: random, 10% (independence), and Large Counts (at least 10 successes and 10 failures).
- A one-proportion z interval is the sample proportion plus or minus z^* times the standard error; z^* is 1.645, 1.960 or 2.576 for 90%, 95% or 99%.

- A P-value is computed assuming H_0 is true; a small P-value is evidence against H_0 .
- A Type I error has probability α ; power equals 1 minus the probability of a Type II error.
- The sample size for a margin of error ME is $n = (z^*/ME)^2 p(1-p)$, rounded up.

How to use this ap statistics proportions quiz

Retake this ap statistics proportions quiz until every answer is right, then move on to the worksheet and the test.

