

# AP Statistics · Inference for Proportions · Test

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

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_ Score: \_\_\_\_\_

This ap statistics proportions test checks inference for proportions in 45 minutes, with 9 questions for a total of 20 points.

Answer all nine questions in 45 minutes. Show conditions, formulas and conclusions in context, as on the free-response section of the AP exam. A calculator is allowed. The test is worth 20 points.

## Test information

- **Grade:** AP Statistics
- **Chapter:** Inference for Proportions
- **Common Core:** AP Statistics Unit 3 (2026-27)
- **Time:** 45 minutes
- **Total:** 20 points (Question 1: 2 pts; Question 2: 3 pts; Question 3: 2 pts; Question 4: 2 pts; Question 5: 3 pts; Question 6: 2 pts; Question 7: 3 pts; Question 8: 2 pts; Question 9: 1 pt)

## AP Statistics Proportions Test: questions 1-5

### Question 1: Checking Large Counts (2 points)

In a random sample of 80 juniors at a large high school, 14 report having a part-time job. A student wants to build a 99% confidence interval for the proportion of all juniors with a part-time job. Determine whether the Large Counts condition is satisfied. Show the counts.

#### Part-time jobs

|    |    |
|----|----|
| 14 | 66 |
|----|----|

jobs

no job

$n = 80$

Sample of 80 juniors.

### Question 2: Interval for one proportion (3 points)

In a random sample of 320 customers at a coffee shop (a small fraction of all customers), 128 ordered a pastry.

- Construct a 95% confidence interval for the proportion of all customers who order a pastry. Verify the Large Counts condition. (2 points)
- Interpret the interval in context. (1 point)

### Question 3: Meaning of confidence level (2 points)

A 95% confidence interval for a population proportion is computed from a random sample.

- Explain what the phrase "95% confident" means. (1 point)
- The researcher recomputes the interval at 99% confidence with the same data. Describe how the width changes and give a reason. (1 point)

### Question 4: Sample size (2 points)

Maya plans a survey to estimate the proportion of residents who use public transit. An earlier survey found about 40% use it. Find the minimum sample size that gives a 95% confidence interval with a margin of error of no more than 0.035.

### Question 5: Significance test for a proportion (3 points)

A manufacturer claims that at least 90% of its smart plugs connect on the first try. A consumer group tests 150 randomly selected plugs (a small fraction of all plugs made) and finds that 127 connect on the first try. Do the data provide convincing evidence against the manufacturer's claim? Use a significance level of 0.05.

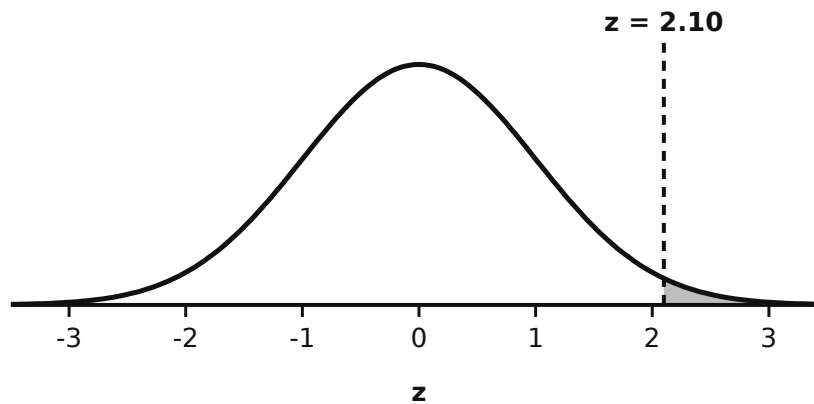
## AP Statistics Proportions Test: questions 6-9

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### Question 6: Finding and interpreting a P-value (2 points)

A test of  $H_0: p = 0.25$  versus  $H_a: p > 0.25$  about the proportion of drivers who text while driving gave the standardized test statistic  $z = 2.10$ , shown below.

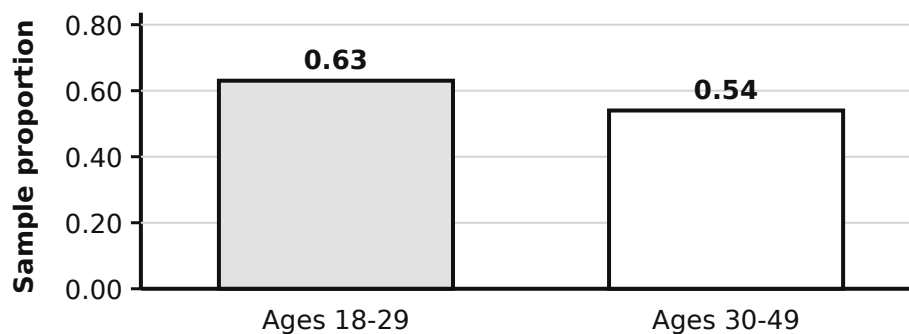
- Find the P-value. (1 point)
- Interpret the P-value in context. (1 point)



Shaded region: the area to the right of  $z = 2.10$ .

### Question 7: Difference of two proportions (3 points)

A fitness company takes independent random samples of adults. Of 400 adults ages 18-29, 252 use its app; of 500 adults ages 30-49, 270 use it. Let  $p_1$  and  $p_2$  be the two population proportions.



Sample proportions who use the app.

- Construct and report a 95% confidence interval for  $p_1 - p_2$ . Assume the conditions are met. (2 points)
- Does the interval give convincing evidence that the proportion differs between the age groups? Justify the answer. (1 point)

### Question 8: Type I and Type II errors (2 points)

A city claims that 70% of residents are satisfied with bus service. A reporter tests  $H_0: p = 0.70$  versus  $H_a: p < 0.70$ .

- Describe a Type I error in context. (1 point)
- Describe a Type II error in context and one consequence. (1 point)

### Question 9: Meaning of power (1 point)

The test in the previous question has power 0.65 against the alternative  $p = 0.60$ . Describe what this means in context.

### How to use this ap statistics proportions test

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Take this ap statistics proportions test without notes, then grade it with the test answer key out of 20 points.

