

AP Statistics · Inference for Proportions · Test Answer Key

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

This ap statistics proportions test answer key gives the full solution and the scoring guide for each of the 9 test questions on inference for proportions.

Each solution shows the full work expected on a free-response question, followed by a scoring guide. Award points for correct conditions, correct computations, and conclusions written in the context of the problem.

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

AP Statistics Proportions Test Answer Key: questions 1-5

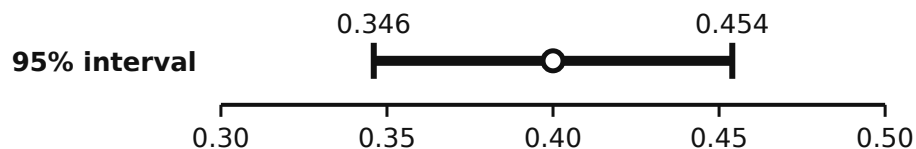
Question 1: Checking Large Counts (2 points)

$n\hat{p} = 14$ and $n(1-\hat{p}) = 80 - 14 = 66$. Both are at least 10, so **Large Counts is satisfied**.

Scoring: 1 point for both counts (14 and 66); 1 point for the correct conclusion based on comparing both with 10.

Question 2: Interval for one proportion (3 points)

- a. $\hat{p} = \frac{128}{320} = 0.400$; counts 128 and 192 are at least 10. $SE = \sqrt{\frac{0.4(0.6)}{320}} = 0.0274$, $ME = 1.960(0.0274) = 0.054$. The interval is **(0.346, 0.454)**.
- b. **We are 95% confident that the interval from 0.346 to 0.454 captures the true proportion of all customers who order a pastry.**



The 95% interval for the proportion ordering a pastry.

Scoring: (a) 1 point for the Large Counts check and the correct standard error and margin of error, 1 point for the interval; (b) 1 point for naming the confidence level, interval, and parameter in context.

Question 3: Meaning of confidence level (2 points)

- If many random samples of the same size were taken and a 95% interval built from each, about 95% of the intervals would capture the true proportion.
- The interval becomes **wider**, because a higher confidence level requires a larger critical value z^* (2.576 instead of 1.960).

Scoring: (a) 1 point for describing the long-run capture rate of the method; (b) 1 point for "wider" with the critical-value reason.

Question 4: Sample size (2 points)

$$n \geq \left(\frac{1.960}{0.035}\right)^2 (0.4)(0.6) = 3136(0.24) = 752.64. \text{ Round up: } n = 753.$$

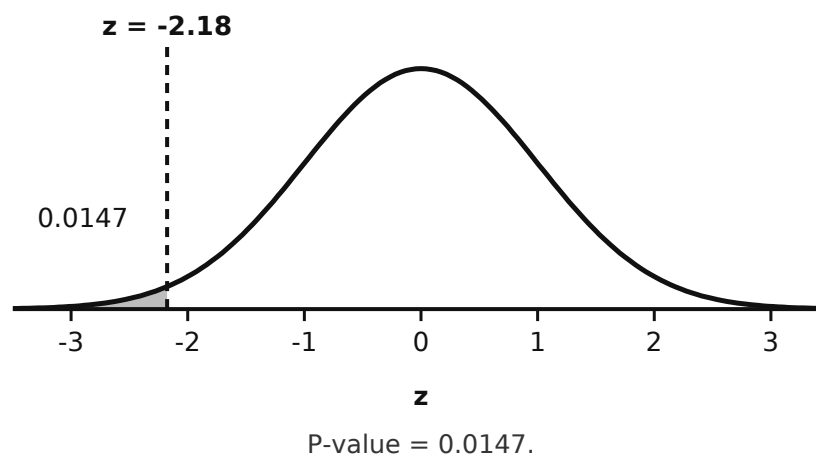
Scoring: 1 point for the correct setup with $z^* = 1.960$, $ME = 0.035$ and the prior estimate 0.4; 1 point for the correct value rounded up to 753.

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

$H_0: p = 0.90$, $H_a: p < 0.90$, where p is the proportion of all plugs that connect on the first try.

Conditions: random; $150(0.90) = 135$ and $150(0.10) = 15$ are at least 10. $\hat{p} = 0.847$,

$$SE_0 = \sqrt{\frac{0.9(0.1)}{150}} = 0.0245, \quad z = \frac{0.847 - 0.900}{0.0245} = -2.18, \quad P\text{-value} = 0.015.$$



Since $0.015 < 0.05$, reject H_0 : **there is convincing evidence that fewer than 90% of the plugs connect on the first try.**

Scoring: 1 point for hypotheses with the parameter defined; 1 point for conditions, correct z and P -value; 1 point for a conclusion that compares the P -value with 0.05 and is stated in context.

AP Statistics Proportions Test Answer Key: questions 6-9

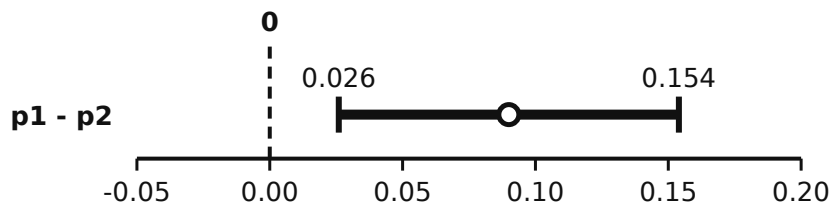
Question 6: Finding and interpreting a P-value (2 points)

- a. $P\text{-value} = P(Z > 2.10) = 1 - 0.9821 = \mathbf{0.018}$.
- b. **If the true proportion of drivers who text while driving were 0.25, the probability of getting a sample result at least this far above 0.25 by chance alone is about 0.018.**

Scoring: (a) 1 point for 0.018 (0.0179 accepted); (b) 1 point for an interpretation that assumes H_0 is true, refers to a result at least as extreme, and is stated in context.

Question 7: Difference of two proportions (3 points)

- a. $\hat{p}_1 = 0.630$, $\hat{p}_2 = 0.540$, difference 0.090. $SE = \sqrt{\frac{0.63(0.37)}{400} + \frac{0.54(0.46)}{500}} = 0.0329$, $ME = 1.960(0.0329) = 0.064$. The interval is **(0.026, 0.154)**.
- b. **Yes.** Every value in the interval is positive, so 0 is not plausible; there is convincing evidence that a higher proportion of adults ages 18-29 use the app.



The interval lies to the right of 0.

Scoring: (a) 1 point for the correct standard error; 1 point for the correct margin of error and interval; (b) 1 point for noting that 0 is not in the interval and concluding in context.

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

- a. The reporter concludes that fewer than 70% of residents are satisfied when the true proportion is actually 70%.
- b. The reporter finds no convincing evidence that fewer than 70% are satisfied when the true proportion is below 70%. Consequence: the city may overlook a real problem with the bus service.

Scoring: 1 point for each description that refers to the true proportion and the conclusion in context; the consequence in (b) must be consistent with the error.

Question 9: Meaning of power (1 point)

If the true proportion of satisfied residents is 0.60, there is a 65% chance that the test will

reject H_0 and detect that fewer than 70% are satisfied.

Scoring: 1 point for a statement that gives the probability of rejecting H_0 when the alternative value is true, in context.

Scoring summary

Total
20 points: add the points of every question of this ap statistics proportions test answer key.

How to use this ap statistics proportions test answer key

Use this ap statistics proportions test answer key to score the test fairly and to see which skills need more practice.

