

AP Statistics · Sampling Distributions · Test Answer Key

Common Core AP Statistics Unit 2 (2026-27) · mathovore.fr

This ap statistics sampling test answer key gives the full solution and the scoring guide for each of the 8 test questions on sampling distributions.

Each solution is followed by a scoring guide. Award partial credit when the setup is correct but arithmetic is slightly off. As on the AP exam, a conclusion earns credit only when it refers to the context and is supported by a probability, a z-score or a condition check.

AP Statistics Common Core: AP Statistics Unit 2 (2026-27)

AP Statistics Sampling Test Answer Key: questions 1-5

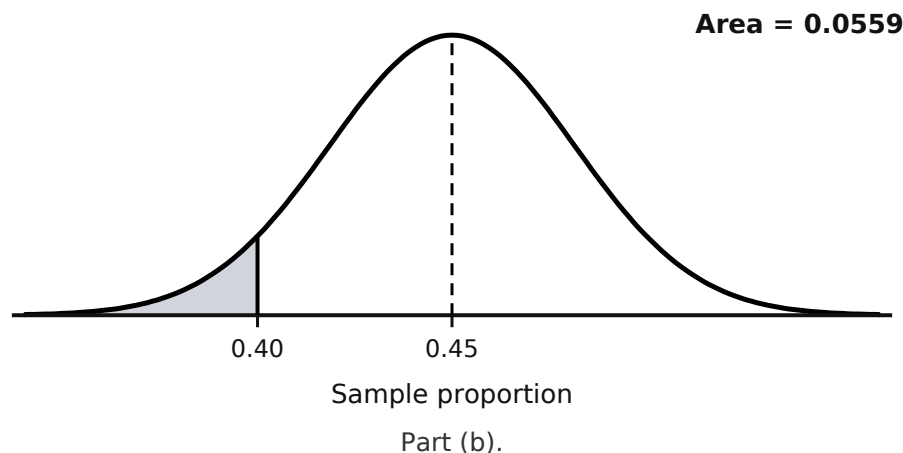
Question 1: Sample proportion of students (2 points)

- a. $\mu_{\hat{p}} = 0.35$; $\sigma_{\hat{p}} = \sqrt{\frac{0.35(0.65)}{120}} \approx 0.0435$.
- b. The sample size 120 is less than 10% of 4,000 (that is 400); $np = 42 \geq 10$ and $n(1-p) = 78 \geq 10$.

Scoring: (a) 1 point for both values. (b) 1 point for the 10% condition and both normal checks.

Question 2: Probability of a low proportion (3 points)

- a. $\sigma_{\hat{p}} = \sqrt{\frac{0.45(0.55)}{250}} \approx 0.0315$.
- b. $z = \frac{0.40 - 0.45}{0.0315} = -1.59$; $P(\hat{p} < 0.40) = \mathbf{0.0559}$.



Scoring: (a) 1 point. (b) 1 point for the correct z-score, 1 point for the correct area.

Question 3: Sample size and variability (2 points)

Both distributions are centered at 0.50. For $n=100$: $\sigma = \sqrt{\frac{0.5(0.5)}{100}} = 0.05$. For $n=400$: $\sigma = \sqrt{\frac{0.5(0.5)}{400}} = 0.025$.

The larger sample has half the standard deviation, so its sample proportions cluster more tightly around 0.50.

Scoring: 1 point for equal centers and both standard deviations; 1 point for the comparison of spread.

Question 4: Bias and variability (2 points)

Method A is centered at 0.40 and has little spread: low bias, low variability.

Method B is also centered at 0.40, so it is unbiased, but its results are widely spread (high variability). Method C has little spread but is centered near 0.53, above $\mathcal{P}$: it is biased.

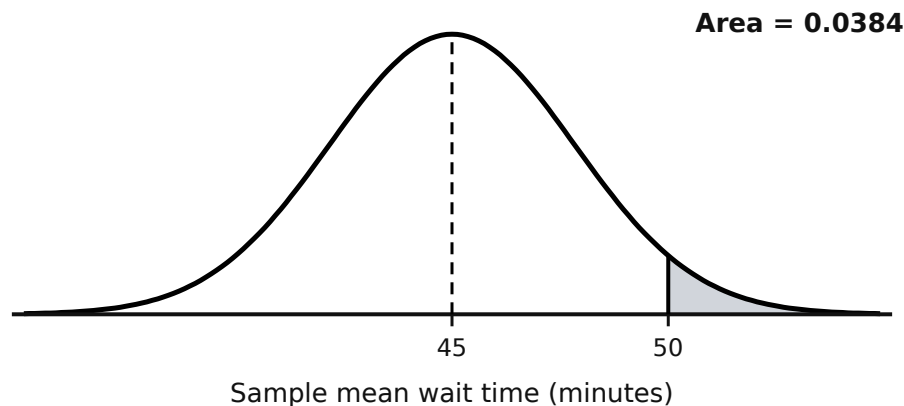
Scoring: 1 point for choosing A with reasoning on center and spread; 1 point for correctly describing both B and C.

Question 5: Sample mean of wait times (3 points)

a. $\mu_{\bar{x}} = 45$; $\sigma_{\bar{x}} = \frac{20}{\sqrt{50}} \approx 2.8284$.

b. Approximately normal: although the population is skewed, $n=50 \geq 30$, so the Central Limit Theorem applies.

c. $z = \frac{50-45}{2.8284} = 1.77$; $P(\bar{x} > 50) = \mathbf{0.0384}$.



Part (c).

Scoring: (a) 1 point for both values. (b) 1 point for normal and a justification using the Central Limit Theorem and n . (c) 1 point for z-score and area.

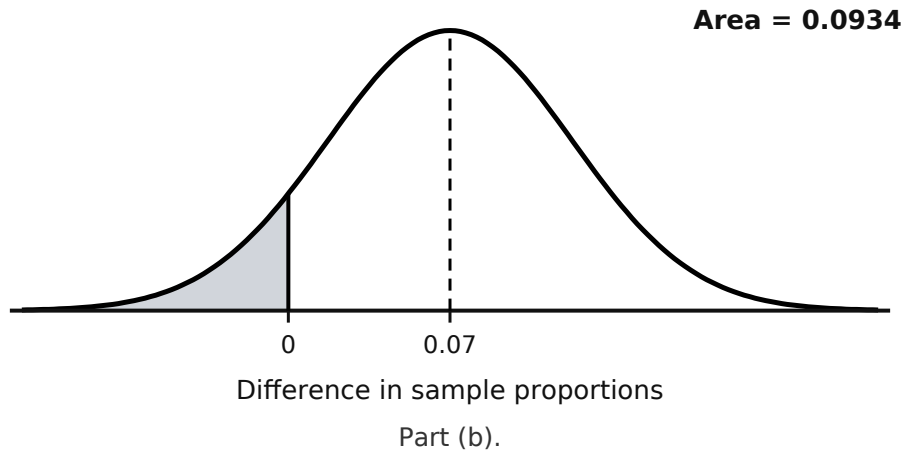
AP Statistics Sampling Test Answer Key: questions 6-8

Question 6: Difference of two proportions (3 points)

a. Mean: $0.62 - 0.55 = 0.07$. Standard deviation:

$$\sqrt{\frac{0.62(0.38)}{150} + \frac{0.55(0.45)}{200}} = \sqrt{0.001571 + 0.001238} \approx 0.0530.$$

b. $z = \frac{0 - 0.07}{0.0530} = -1.32$; $P(\hat{p}_1 - \hat{p}_2 < 0) = \mathbf{0.0934}$.



Scoring: (a) 1 point for the mean, 1 point for the standard deviation using the sum of variances. (b) 1 point for the z-score and area.

Question 7: Difference of two means (3 points)

a. Mean: $240 - 225 = 15$. Standard deviation: $\sqrt{\frac{30^2}{40} + \frac{25^2}{35}} = \sqrt{22.5 + 17.857} = \sqrt{40.357} \approx 6.3527$.

b. $z = \frac{20 - 15}{6.3527} = 0.79$; $P = 1 - 0.7852 = \mathbf{0.2148}$.

Scoring: (a) 1 point for the mean, 1 point for the standard deviation. (b) 1 point for z-score and area.

Question 8: Is the claim believable? (2 points)

a. $\sigma_{\hat{p}} = \sqrt{\frac{0.5(0.5)}{200}} \approx 0.0354$; $z = \frac{0.43 - 0.50}{0.0354} = -1.98$; $P(\hat{p} \leq 0.43) = \mathbf{0.0239}$.

b. If the claim were true, about 2.4% of samples would be this low or lower. That is unlikely, so the sample gives reason to doubt the claim.

Scoring: (a) 1 point for the correct probability with setup. (b) 1 point for a conclusion in context linked to the small probability.

Scoring summary

Total

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

How to use this ap statistics sampling test answer key

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

