

AP Statistics · Sampling Distributions · Test

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

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

This ap statistics sampling distributions test checks sampling distributions in 45 minutes, with 8 questions for a total of 20 points.

This free-response test covers sampling distributions for AP Statistics: sample proportions, sample means, the Central Limit Theorem, bias and variability, and differences of two proportions or means. A calculator and z-table are allowed. Check conditions, show your setup, and state conclusions in context. The test has 8 questions worth 20 points and takes about 45 minutes.

Test information

- **Grade:** AP Statistics
- **Chapter:** Sampling Distributions
- **Common Core:** AP Statistics Unit 2 (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: 3 pts; Question 7: 3 pts; Question 8: 2 pts)

AP Statistics Sampling Distributions Test: questions 1-5

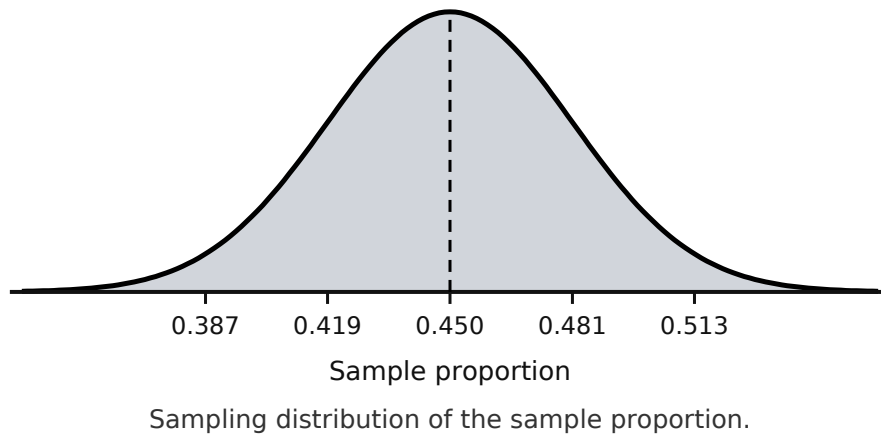
Question 1: Sample proportion of students (2 points)

At a university with 4,000 students, 35% have a part-time job. A random sample of 120 students is taken, and $\hat{p}$ is the sample proportion with a part-time job.

- Find the mean and standard deviation of the sampling distribution of $\hat{p}$. (1 point)
- Verify that the conditions for the standard deviation formula and a normal model are met. (1 point)

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

A national poll finds that 45% of adults own a smart speaker. A random sample of 250 adults is chosen, and $\hat{p}$ is the proportion in the sample who own one. The graph shows the sampling distribution of $\hat{p}$.



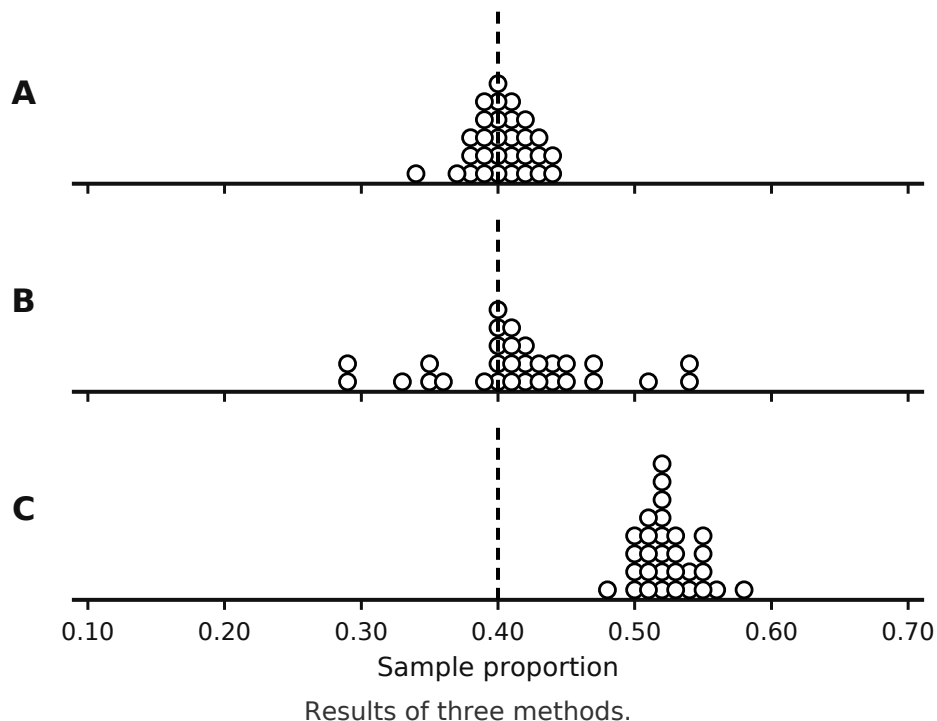
- Find the standard deviation of $\hat{p}$. (1 point)
- Find the probability that fewer than 40% of the sampled adults own a smart speaker. (2 points)

Question 3: Sample size and variability (2 points)

A population has proportion $p = 0.50$. Compare the sampling distributions of $\hat{p}$ for samples of size 100 and size 400. Address center and spread, and give the standard deviations. (2 points)

Question 4: Bias and variability (2 points)

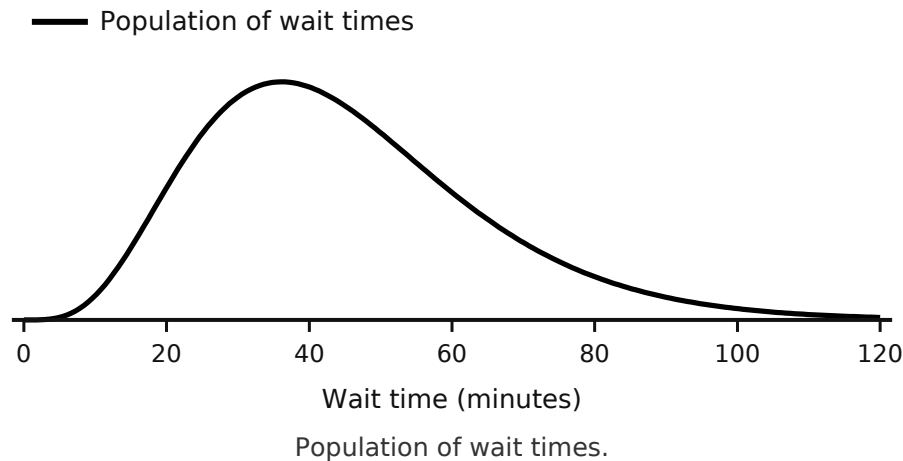
A pollster uses three methods to estimate the true proportion $p = 0.40$. The dot plots show 30 results from each method; the dashed line is p .



Which method has low bias and low variability? Describe the other two. (2 points)

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

Wait times at a clinic are right-skewed with mean 45 minutes and standard deviation 20 minutes, as shown. A random sample of 50 patients is taken (far fewer than 10% of all patients).



- Find the mean and standard deviation of the sampling distribution of $\bar{x}$. (1 point)
- Describe the shape of the sampling distribution and justify. (1 point)
- Find the probability that the sample mean exceeds 50 minutes. (1 point)

AP Statistics Sampling Distributions Test: questions 6-8

Question 6: Difference of two proportions (3 points)

In Town 1, 62% of residents recycle; in Town 2, 55%. Independent random samples of 150 residents from Town 1 and 200 from Town 2 are taken. Let $\hat{p}_1 - \hat{p}_2$ be the difference in sample proportions.

- Find the mean and standard deviation of $\hat{p}_1 - \hat{p}_2$. (2 points)
- Find the probability that the sample from Town 1 has a lower proportion than the sample from Town 2. (1 point)

Question 7: Difference of two means (3 points)

Delivery times for Service A have mean 240 minutes and standard deviation 30 minutes; for Service B, mean 225 minutes and standard deviation 25 minutes. A random sample of 40 deliveries from A and 35 from B is taken. Let $\bar{x}_A - \bar{x}_B$ be the difference of sample means.

- Find the mean and standard deviation of $\bar{x}_A - \bar{x}_B$. (2 points)
- Assuming a normal model, find $P(\bar{x}_A - \bar{x}_B > 20)$. (1 point)

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

A candidate claims that 50% of voters support her. In a random sample of 200 voters (a small part of all voters), only 43% support her. Assume the claim is true.

- a. Find the probability of a sample proportion of 0.43 or less. (1 point)
- b. What does this result suggest about the claim? (1 point)

How to use this ap statistics sampling distributions test

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

