

AP Statistics · Inference for Means · Test Answer Key

Common Core AP Statistics Unit 4 (2026-27) · mathovore.fr

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

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

AP StatisticsCommon Core: AP Statistics Unit 4 (2026-27)

AP Statistics Means Test Answer Key: questions 1-5

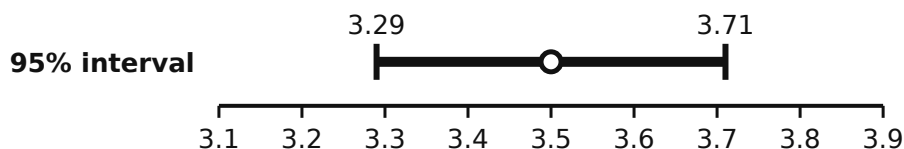
Question 1: Checking conditions (2 points)

Random sample: given. 10% condition: the sample is a small part of a large population. Normal/Large Sample: $n=15 < 30$, but the graph is roughly symmetric and mound-shaped with no outliers. **The conditions are satisfied.**

Scoring: 1 point for addressing the random and 10% conditions; 1 point for checking Normal/Large Sample with the graph and concluding that t is reasonable.

Question 2: Interval for one mean (3 points)

- a. $\bar{x}=3.500$, $s=0.274$, $df=8$, $t^*=2.306$. $ME=2.306 \cdot \frac{0.274}{\sqrt{9}}=0.211$. The interval is **(3.29, 3.71) pounds**.
- b. **We are 95% confident that the interval from 3.29 to 3.71 pounds captures the true mean weight of all jars in the production run.**



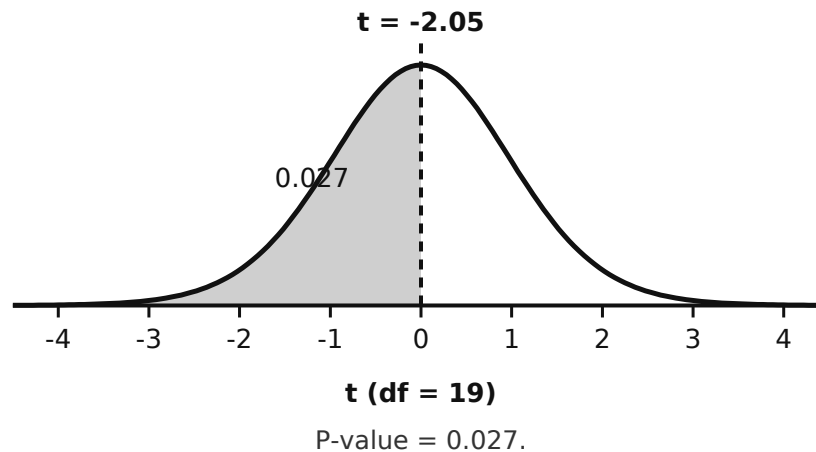
The 95% interval for the mean jar weight.

Scoring: (a) 1 point for the correct mean, s , df and t^* ; 1 point for the correct margin of error and interval; (b) 1 point for naming the confidence level, interval and parameter in context.

Question 3: Significance test for one mean (3 points)

$H_0: \mu = 12.5$, $H_a: \mu < 12.5$, where μ is the true mean volume in ounces.

Conditions: random sample; 20 cups is a small part of the output; the graph shows no strong skewness or outliers. $SE = \frac{2.4}{\sqrt{20}} = 0.537$, $t = \frac{11.4 - 12.5}{0.537} = -2.05$, $df = 19$, P-value = 0.027.



Since the P-value is less than 0.05, reject H_0 : **there is convincing evidence that the true mean volume is less than 12.5 ounces.**

Scoring: 1 point for hypotheses with the parameter defined; 1 point for conditions and the correct t and P-value; 1 point for a conclusion that links the P-value to α and is stated in context.

Question 4: Claim and confidence interval (2 points)

- a. **Yes.** 40 is not in the interval (36.2, 39.4), so 40 is not a plausible value for the mean.
- b. **No.** 38 is inside the interval, so a two-sided test at $\alpha = 0.05$ would fail to reject H_0 .

Scoring: 1 point for each part, with the reason based on whether the value lies in the interval.

Question 5: Paired data (3 points)

Let μ_d be the true mean decrease (before minus after) for all such patients. $H_0: \mu_d = 0$, $H_a: \mu_d > 0$.

Conditions: random sample; the 8 differences are roughly symmetric with no outliers.
Differences: 7, 3, 8, 1, 11, 5, 8, 1. $\bar{x}_d = 5.500$, $s_d = 3.625$, $SE = 1.282$, $t = 4.29$, $df = 7$, P-value = 0.0018.

Since the P-value is less than 0.05, reject H_0 : **there is convincing evidence that the diet lowers mean systolic blood pressure.**

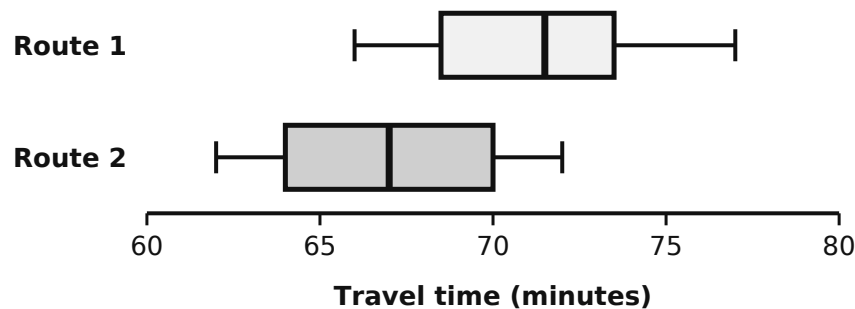
Scoring: 1 point for the hypotheses in terms of μ_d (paired setup); 1 point for the conditions and the correct t and P -value; 1 point for the conclusion in context.

AP Statistics Means Test Answer Key: questions 6-9

Question 6: Two independent means (3 points)

$H_0: \mu_1 = \mu_2$, $H_a: \mu_1 \neq \mu_2$, where μ_1 and μ_2 are the true mean travel times on Route 1 and Route 2.

Conditions: routes randomly chosen; the box plots show no strong skewness or outliers in either sample. $\bar{x}_1 = 71.17$, $s_1 = 3.326$; $\bar{x}_2 = 67.00$, $s_2 = 3.317$. $SE = 1.386$, $t = 3.01$, $df = 20.8$, $P\text{-value} = 0.0068$.



The two samples; route 1 is centered higher.

Since the P -value is less than 0.05, reject H_0 : **there is convincing evidence that the mean travel times differ between the routes.**

Scoring: 1 point for hypotheses with parameters defined; 1 point for the conditions and the correct t , df and P -value; 1 point for a conclusion in context.

Question 7: Choosing a procedure (2 points)

- One-sample z interval for a proportion** (categorical data, one sample).
- Paired t procedure** (a test or interval for μ_d), because each customer gives two times.

Scoring: 1 point per correct procedure; for (b), "paired" or "matched pairs" is required.

Question 8: t versus z (1 point)

Because s estimates the population standard deviation, there is extra uncertainty, and the t -distribution with 11 degrees of freedom has heavier tails than the normal curve ($t^* = 2.201$).

Scoring: 1 point for referring to heavier tails or extra uncertainty from estimating the standard deviation.

Question 9: Sample size and interval width (1 point)

The interval from the sample of 64 is narrower, because the standard error $\frac{s}{\sqrt{n}}$ is smaller and t^* is slightly smaller.

Scoring: 1 point for naming the larger sample and giving the standard-error reason.

Scoring summary

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

How to use this ap statistics means test answer key

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

