

AP Statistics · Inference for Means · Quiz

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

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

This ap statistics means quiz asks 10 multiple-choice questions on inference for means, and each answer comes with a short explanation.

Choose the best answer for each of the ten questions on inference for means. Several questions use a graph or an interval. Read each explanation to see why the tempting wrong choices fail.

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

Questions

Question 1

A random sample of 20 values is used for a one-sample t interval. How many degrees of freedom are used?

- A. 20
- B. 18
- C. 19
- D. 21

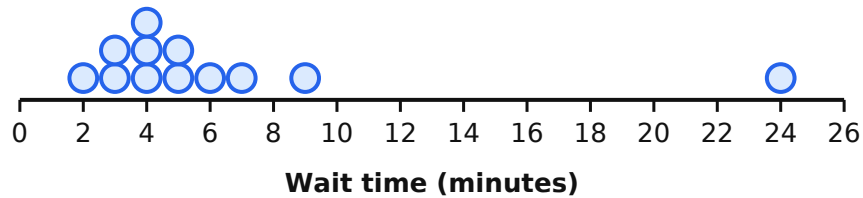
Question 2

What is the critical value t^* for a 95% confidence interval for a mean when $n = 15$?

- A. 2.145
- B. 2.131
- C. 1.960
- D. 1.761

Question 3

A random sample of 12 wait times is graphed below. Is a one-sample t interval for the mean appropriate?



Wait times for 12 randomly selected cars.

- A. Yes, because the sample was selected at random
- B. Yes, because t procedures work for any sample size
- C. No, because the sample size must be exactly 30
- D. No, because the sample is small and the graph shows strong skewness and an outlier

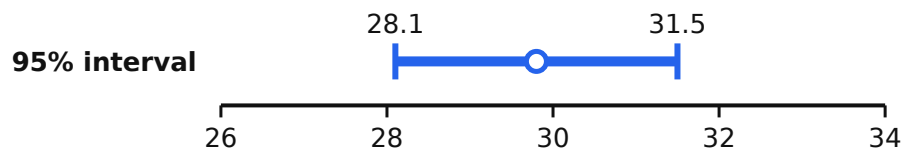
Question 4

A random sample of 36 batteries has $s = 6$ hours. What is the standard error of the sample mean?

- A. 1 hour
- B. 6 hours
- C. 0.167 hour
- D. 36 hours

Question 5

The figure shows a 95% t interval for the mean commute time of all workers at a company. Which is the correct interpretation?

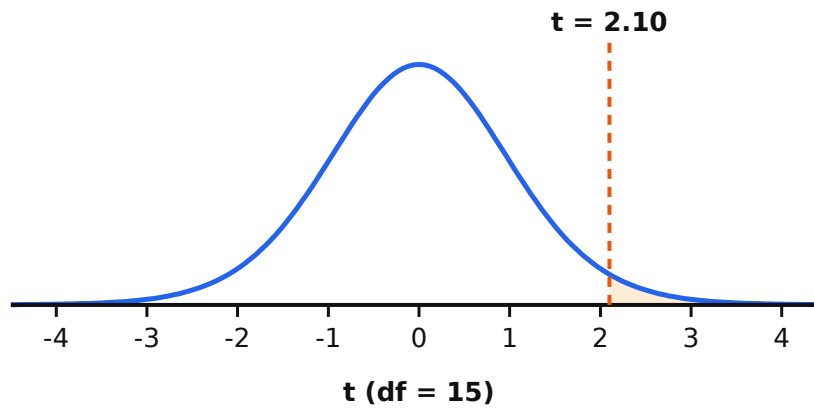


95% interval for the mean commute time.

- A. We are 95% confident that the true mean commute time is between 28.1 and 31.5 minutes
- B. 95% of workers have commute times between 28.1 and 31.5 minutes
- C. There is a 95% chance that the sample mean is between 28.1 and 31.5 minutes
- D. The mean commute time is 29.8 minutes 95% of the time

Question 6

A right-tailed one-sample t test with $n = 16$ gives $t = 2.10$, shown below. Which is closest to the P-value?



Shaded: the area to the right of $t = 2.10$.

- A. 0.053
- B. 0.973
- C. 0.013
- D. 0.027

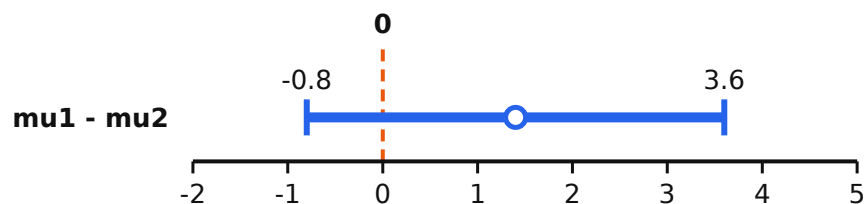
Question 7

A coach times 14 swimmers in the 100-meter freestyle before and after a new training plan to see whether the plan reduces mean times. Which procedure is appropriate?

- A. A two-sample t test comparing two independent groups
- B. A two-proportion z test
- C. A one-sample z test for a proportion
- D. A paired t test using the 14 differences

Question 8

A 95% two-sample t interval for $\mu_1 - \mu_2$ is shown. What conclusion is justified?



A 95% interval for the difference of two means.

- A. There is convincing evidence that μ_1 is greater, since the sample difference is positive
- B. There is not convincing evidence that the two means differ, since 0 is in the interval
- C. There is convincing evidence that the means are equal
- D. There is convincing evidence of a difference, since the interval is wide

Question 9

A researcher compares the mean heights of plants in two randomly assigned groups of 15 plants each. Which procedure is appropriate?

- A. A paired t procedure on the differences
- B. A two-sample t procedure for the difference of means
- C. A two-proportion z procedure
- D. A one-sample t interval for one mean

Question 10

As the degrees of freedom of a t-distribution increase, what happens to the t curve?

- A. Its tails get heavier
- B. Its center shifts to the right
- C. It gets closer to the standard normal curve
- D. It becomes skewed to the right

Answer key

1. **C** - For one sample, $df = n - 1 = 19$. Using $n = 20$ is the most common slip.
2. **A** - With $df = 14$, $t^* = 2.145$. The value 2.131 is for $df = 15$, 1.960 is the z value, and 1.761 is for 90% confidence.
3. **D** - With $n = 12$ the Normal/Large Sample condition depends on the graph. Strong skewness and an outlier make t procedures unreliable.
4. **A** - $SE = s$ divided by the square root of $n = 6 / 6 = 1$. Using s itself, or dividing by n instead of its square root, are typical mistakes.
5. **A** - The interval estimates the population mean. It does not describe individual workers, and the sample mean is known exactly.
6. **D** - With $df = 15$, $P(t > 2.10) = 0.027$. Doubling it (0.053) is for a two-sided test; 0.973 is the area to the left.
7. **D** - Each swimmer has two times, so the data are paired. Analyze the 14 differences with a one-sample t procedure.
8. **B** - Because 0 is a plausible value for the difference, the data do not show a difference. That does not prove the means are equal.
9. **B** - Heights are quantitative data from two independent groups, so use a two-sample t procedure. Pairing requires two measurements on matched subjects.
10. **C** - A t curve is symmetric around 0 for every df . With more degrees of freedom its tails shrink and it approaches the standard normal curve.

How does this quiz work?

Read each question, choose one answer among A, B, C and D, then check it: a short explanation appears after every answer. Your score out of 10 is shown at the end, and you can restart the quiz as often as you like.

What should you review before the quiz?

Reread the key facts of the lesson and the worked example. If a question is hard, go back to the matching part of the lesson, then try the quiz again. Write your work on scrap paper: most mistakes come from skipping a step, not from the idea itself.

Remember:

- A t statistic has $df = n - 1$ for one sample and for paired differences; the t-distribution has heavier tails than the normal curve.
- Conditions: random, 10% condition, and Normal/Large Sample (n at least 30, or no strong skew or outliers).
- Paired data become one sample of differences, with parameter μ_d .
- A two-sample t procedure uses $SE = \sqrt{s_1^2/n_1 + s_2^2/n_2}$ and the calculator's

degrees of freedom.

- An interval for a difference that contains 0 does not show a difference.

How to use this ap statistics means quiz

Retake this ap statistics means quiz until every answer is right, then move on to the worksheet and the test.

