

AP Statistics - t Intervals and t Tests for a Mean - Quiz

Common Core AP STAT 7.1, AP STAT 7.2, AP STAT 7.3, AP STAT 7.4, AP STAT 7.5, HSS-IC.B.4 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Ten multiple-choice questions test t critical values, standard errors, and conditions. Read the explanations, especially for questions that involve the Normal condition.

AP Statistics · Common Core State Standards: **AP STAT 7.1, AP STAT 7.2, AP STAT 7.3, AP STAT 7.4, AP STAT 7.5, HSS-IC.B.4**

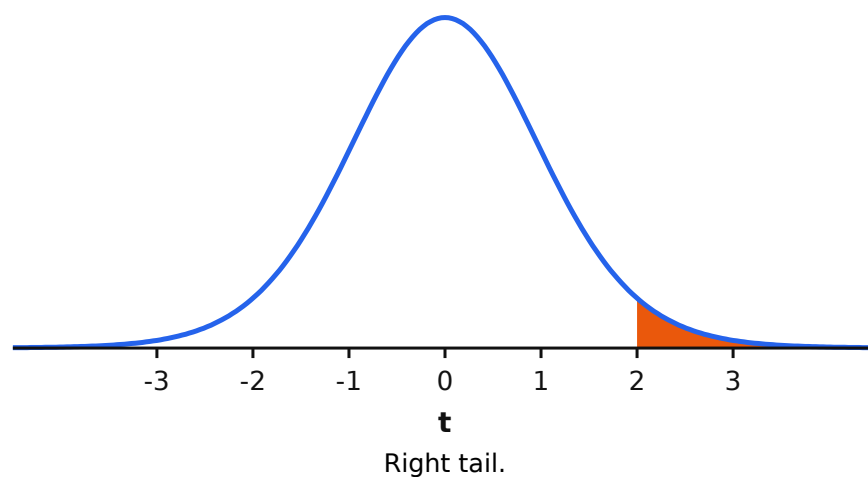
Questions

Question 1

The degrees of freedom for a one-sample t procedure with $n = 25$ are:

- A. 25
- B. 24
- C. 26
- D. 5

Question 2

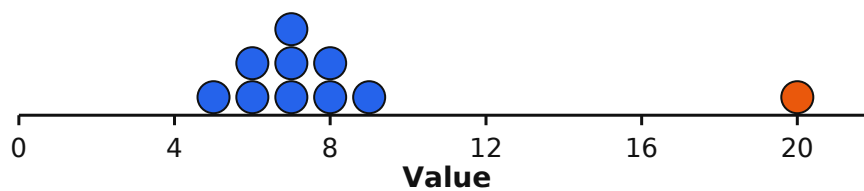


The shaded area ($df = 15$) is closest to:

- A. 0.064
- B. 0.5

- C. 0.97
- D. 0.032

Question 3

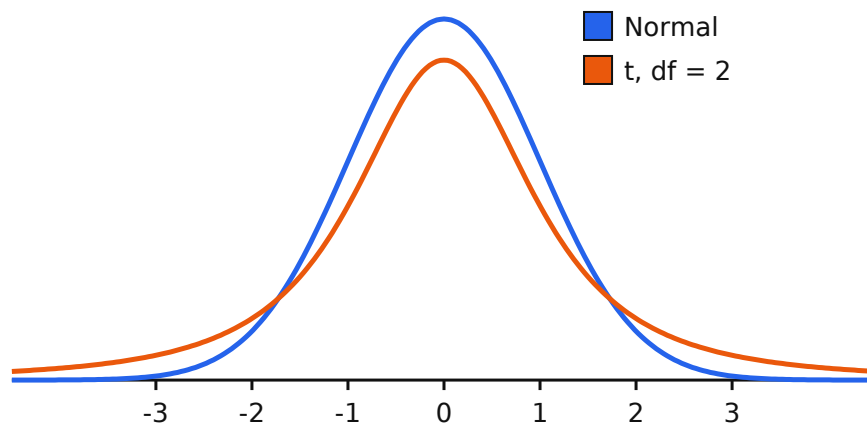


A small sample.

A t interval for the mean using this random sample of 10 values is:

- A. appropriate because $n = 10$
- B. appropriate because the median is 7
- C. not appropriate because of the outlier
- D. only valid if $\alpha = 0.01$

Question 4



Normal versus t.

Compared with the normal curve, the t curve has:

- A. lighter tails
- B. heavier tails
- C. a different center
- D. a larger peak

Question 5

The standard error of $\bar{x}$ is estimated by:

- A. $s / \sqrt{n}$

- B. $\sigma / \sqrt{n}$
- C. s / n
- D. $s \sqrt{n}$

Question 6

As the sample size increases, t^* for 95% confidence:

- A. decreases toward 1.96
- B. increases
- C. stays the same
- D. becomes negative

Question 7

For matched pairs data, we:

- A. analyze two independent samples
- B. use a z procedure
- C. use the larger group
- D. compute differences and analyze them as one sample

Question 8

A 95% t interval for μ is (10.2, 14.8). Which H_0 would be rejected in a two-sided test at $\alpha = 0.05$?

- A. $\mu = 12$
- B. $\mu = 9$
- C. $\mu = 10.5$
- D. $\mu = 14$

Question 9

The t statistic is $t = (\bar{x} - \mu_0) / (s/\sqrt{n})$. If $\bar{x} = 53$, $\mu_0 = 50$, $s = 9$, $n = 36$, then $t =$

- A. 0.5
- B. 3
- C. 2
- D. 18

Question 10

A p-value of 0.12 at $\alpha = 0.05$ leads to:

- A. failing to reject H_0
- B. rejecting H_0
- C. accepting H_0
- D. doubling α

Answers

1. **B** - $df = n - 1 = 24$.
2. **D** - The right-tail area beyond $t = 2.0$ with $df = 15$ is about 0.032.
3. **C** - With a small sample, the outlier violates the Normal condition.
4. **B** - The t distribution is centered at 0 but has more area in the tails.
5. **A** - Because σ is unknown, we use the sample standard deviation s .
6. **A** - More degrees of freedom bring the t distribution closer to the normal distribution.
7. **D** - The pairing makes the two measurements dependent.
8. **B** - Only values outside the interval are rejected; 9 is below 10.2.
9. **C** - $SE = 9/6 = 1.5$, and $3/1.5 = 2$.
10. **A** - $0.12 > 0.05$, so the evidence is not convincing.

Remember

- t distribution: bell-shaped, centered at 0, heavier tails; $df = n - 1$.
- Interval: $\bar{x} \pm t^* s/\sqrt{n}$; test: $t = (\bar{x} - \mu_0)/(s/\sqrt{n})$.
- Conditions: random, 10% condition, and Normal/Large Sample (population normal, $n \geq 30$, or no strong skew or outliers).
- As df grows, t^* approaches z^* .
- Matched pairs: take differences and do a one-sample t procedure.