7. Inference for Quantitative Data: Means

Starter Quiz · 课前小测

AP Statistics Name: _____ Score: _____

1. Inference about a mean uses the t-distribution (not z) mainly because...
   - ☐ the population σ is unknown and estimated by s
   - ☐ means are always skewed
   - ☐ z is illegal
   - ☐ the sample is too big
2. For a one-sample t-interval with n = 25, what are the degrees of freedom (n − 1)?

   _____
3. A 95% interval for a mean is (145.9, 154.1). The claim $\mu = 160$ is...
   - ☐ not plausible (outside the interval)
   - ☐ plausible (inside)
   - ☐ proven true
   - ☐ impossible to judge
4. The null hypothesis for a one-mean test has the form...
   - ☐ H0: $\mu = \mu 0$
   - ☐ H0: x-bar = 0
   - ☐ Ha: $\mu \neq \mu 0$
   - ☐ H0: s = 0
5. With p-value = 0.032 and $\alpha = 0.05$, the decision is...
   - ☐ reject H0
   - ☐ fail to reject H0
   - ☐ accept H0
   - ☐ raise α
6. Measuring the same runners before and after training is which design?
   - ☐ paired (matched pairs)
   - ☐ two independent samples
   - ☐ a one-proportion study
   - ☐ a census

7. s1=6,n1=25 and s2=8,n2=25. Compute SE = $\sqrt{(36/25 + 64/25)}$.

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8. Sampling variability is a mistake in data collection that must be fixed.

☐ True ☐ False

9. s = 10, n = 25. Compute the standard error of the mean $s/\sqrt{n}$.

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10. '95% confidence' means there is a 95% probability that μ is in this particular interval.

☐ True ☐ False

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Answers · 答案

AP Statistics

1. **the population σ is unknown and estimated by s**

   Estimating σ with s adds uncertainty → use t.

2. **24**

   df = n − 1 = 25 − 1 = 24.

3. **not plausible (outside the interval)**

   160 lies outside → evidence against it.

4. **H0: $\mu = \mu 0$**

   H0 states a specific claimed mean $\mu 0$.

5. **reject H0**

   $0.032 \leq 0.05$ → reject H0.

6. **paired (matched pairs)**

   Same subjects measured twice → paired.

7. **2**

   $\sqrt{(1.44 + 2.56)} = \sqrt{4} = 2$.

8. **False**

   Variability is natural and quantifiable — not a blunder.

9. **2**

   $10/\sqrt{25} = 10/5 = 2$.

10. **False**

    μ is fixed; confidence describes the method over many samples.