1. Inference about a mean uses the t-distribution (not z) mainly because...
   - ☐ the sample is too big for z
   - ☐ z is not allowed for means
   - ☐ sample means are always skewed
   - ☐ the population $\sigma$ is unknown and estimated by s

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...
   - ☐ proven true
   - ☐ not plausible (outside the interval)
   - ☐ plausible (inside)
   - ☐ impossible to judge

4. The null hypothesis for a one-mean test has the form...
   - ☐ Ha: $\mu \neq \mu 0$
   - ☐ H0: s = 0
   - ☐ H0: x-bar = 0
   - ☐ H0: $\mu = \mu 0$

5. With p-value = 0.032 and $\alpha = 0.05$, the decision is...
   - ☐ reject H0
   - ☐ accept H0
   - ☐ raise $\alpha$
   - ☐ fail to reject H0

6. Measuring the same runners before and after training is which design?
   - ☐ two independent samples
   - ☐ a one-proportion study
   - ☐ paired (matched pairs)
   - ☐ a census

7. For a difference-of-means interval, the value representing 'no difference' is 0.
   ☐ True ☐ False

8. s1=6,n1=25 and s2=8,n2=25. Compute SE = √(36/25 + 64/25).

   _____

9. The paired t-test statistic is t = d-bar / (s_d/√n) with df = n − 1.
   ☐ True ☐ False

10. A wrong inference procedure can invalidate a conclusion even when its arithmetic is correct.
    ☐ True ☐ False



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1. **the population $\sigma$ is unknown and estimated by s**

   Estimating $\sigma$ 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. **True**

   $\mu 1 - \mu 2 = 0$ means equal means.

8. **2**

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

9. **True**

   It's a one-sample t-test on the paired differences.

10. **True**

    The method must fit the study design and assumptions. Correct arithmetic alone does not establish a valid inference.