1. Which is a parameter (not a statistic)?

   ☐ the true population mean μ

   ☐ the sample mean x-bar

   ☐ the sample proportion p-hat

   ☐ the sample standard deviation s

2. A statistic is normal with mean 50 and SD 4. Find the z-score of the value 58.

   _____

3. The Central Limit Theorem says that for a large sample, the sampling distribution of x-bar is...

   ☐ exactly the population shape

   ☐ always skewed like the population

   ☐ approximately normal

   ☐ uniform

4. An estimator is unbiased when the center of its sampling distribution...

   ☐ is as small as possible

   ☐ equals the sample size

   ☐ equals the true parameter

   ☐ equals zero

5. p = 0.4, n = 100. Find σ of p-hat = $\sqrt{p(1-p)/n}$. Round to two decimals.

   _____

6. p1=0.5, p2=0.4. Find the center (mean) of p-hat-1 − p-hat-2.

   _____

7. Population $\sigma = 20$, n = 25. Find the SD of x-bar, $\sigma/\sqrt{n}$.

   _____

8. $\mu 1 = 50$, $\mu 2 = 45$. Find the center of x-bar-1 − x-bar-2.

   _____

9. Two random samples from the same population will usually give slightly different statistics.

   ☐ True ☐ False

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☐ mean 0 and standard deviation 1

☐ mean 50 and SD 10

☐ no fixed mean

☐ mean 1 and SD 0

1. **the true population mean μ**

   μ is a fixed population value – a parameter. The others come from samples.

2. **2**

   z = (58 − 50)/4 = 2.

3. **approximately normal**

   The CLT delivers approximate normality of x-bar for large n.

4. **equals the true parameter**

   Unbiased = centered on the parameter.

5. **0.05**

   $\sqrt{}(0.4 \cdot 0.6/100) = \sqrt{}0.0024 \approx 0.049 \approx 0.05$.

6. **0.1**

   Mean = p1 − p2 = 0.5 − 0.4 = 0.1.

7. **4**

   $20/\sqrt{}25 = 20/5 = 4$.

8. **5**

   $\mu 1 - \mu 2 = 50 - 45 = 5$.

9. **True**

   That's sampling variability – expected, not an error.

10. **mean 0 and standard deviation 1**

    By definition, mean 0 and SD 1.

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