

AP Statistics

Name: _____ Score: _____

1. Which is a parameter (not a statistic)?
 - ☐ the true population mean μ
 - ☐ the sample mean $\bar{x}$
 - ☐ the sample proportion $\hat{p}$
 - ☐ 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 $\bar{x}$ is...
 - ☐ approximately normal
 - ☐ always skewed like the population
 - ☐ uniform
 - ☐ exactly the population shape
4. An estimator is unbiased when the center of its sampling distribution...
 - ☐ equals the true parameter
 - ☐ equals zero
 - ☐ is as small as possible
 - ☐ equals the sample size
5. $p = 0.4$, $n = 100$. Find σ of $\hat{p} = \sqrt{p(1-p)/n}$. Round to two decimals.

6. $p_1=0.5$, $p_2=0.4$. Find the center (mean) of $\hat{p}_1 - \hat{p}_2$.

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

8. $\mu_1 = 50$, $\mu_2 = 45$. Find the center of $\bar{x}_1 - \bar{x}_2$.

9. Two random samples from the same population will usually give slightly different statistics.
 - ☐ True ☐ False

10. The standard normal distribution has...

- ☐ mean 0 and standard deviation 1
- ☐ mean 1 and SD 0
- ☐ mean 50 and SD 10
- ☐ no fixed mean

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 $\bar{x}$ 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**

$$\text{Mean} = p_1 - p_2 = 0.5 - 0.4 = 0.1.$$

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.