1. For $X \sim Po(3)$, what is the mean of X?

   _____

2. X has mean 5. What is $E(3X - 1)$?

   _____

3. A probability density function must satisfy $\int f(x)dx$ over all x equals what value?

   _____

4. A population has $\sigma = 8$. For a sample of $n = 64$, what is $Var(X) = \sigma^2/n$?

   _____

5. Population mean claimed 50, $\sigma = 8$, sample $n = 64$, $\bar{x} = 52$. What is $z = (\bar{x} - \mu)/(\sigma/\sqrt{n})$?

   _____

6. For a Poisson distribution, the mean and variance are always equal.

   ☐ True ☐ False

7. In $Var(aX + b)$, the constant b:

   ☐ is squared

   ☐ is added to the variance

   ☐ doubles the variance

   ☐ has no effect on the variance

8. For a continuous variable, $P(a < X < b)$ is the area under f(x) between a and b.

   ☐ True ☐ False

9. By the Central Limit Theorem, the sample mean is approximately normal for a large sample, whatever the population shape.

   ☐ True ☐ False

10. A Type I error is:

    ☐ accepting $H_0$ when it is actually false

    ☐ using the wrong sample

    ☐ rejecting $H_0$ when it is actually true

    ☐ choosing the wrong significance level



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1. **3**

   For a Poisson variable, the mean equals $\lambda = 3$ (and so does the variance).

2. **14**

   $E(3X - 1) = 3E(X) - 1 = 3\times5 - 1 = 14$.

3. **1**

   The total area under a pdf is always 1.

4. **1**

   $Var(X) = \sigma^2/n = 64/64 = 1$.

5. **2**

   $z = (52 - 50)/(8/\sqrt{64}) = 2/(8/8) = 2/1 = 2$.

6. **True**

   This is a defining property of the Poisson distribution: $E(X) = Var(X) = \lambda$.

7. **has no effect on the variance**

   Adding a constant shifts the data but does not change its spread, so b drops out.

8. **True**

   Probabilities for a continuous variable are areas under the density function.

9. **True**

   The CLT makes X approximately normal as the sample size grows.

10. **rejecting $H_0$ when it is actually true**

    Type I = reject a true $H_0$; Type II = accept a false $H_0$.