HYPOTHESIS TESTING: PRACTICE 1; SINGLE MEAN, KNOWN POPULATION STANDARD DEVIATION

STUDENT LEARNING OUTCOMES:

- **THE STUDENT WILL EXPLORE HYPOTHESIS TESTING WITH SINGLE MEAN AND KNOWN POPULATION STANDARD DEVIATION.**

GIVEN:

Suppose that a recent article stated that the average time spent in jail by a first–time convicted burglar is 2.5 years. A study was then done to see if the average time has increased in the new century. A random sample of 26 first–time convicted burglars in a recent year was picked. The average length of time in jail from the survey was 3 years with a standard deviation of 1.8 years. Suppose that it is somehow known that the population standard deviation is 1.5. Conduct a hypothesis test to determine if the average length of jail time has increased.

HYPOTHESIS TESTING: SINGLE AVERAGE

1. Is this a test of averages or proportions? _____
2. State the null and alternative hypotheses.

   a. H_o: _____
   b. H_a: _____

3. Is this a right-tailed, left-tailed, or two-tailed test? How do you know?

4. What symbol represents the Random Variable for this test?

5. In words, define the Random Variable for this test.

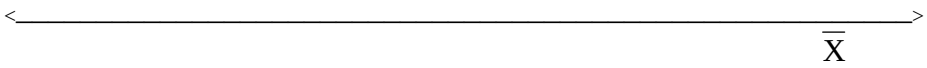
6. Is the population standard deviation known and, if so, what is it?

7. Calculate the following:
   a. $\bar{x}$ = _____
   b. σ = _____
   c. s_X = _____
   d. n = _____

8. Since both σ and s_X are given, which should be used?
   In 1-2 complete sentences, explain why.

9. State the distribution to use for the hypothesis test.

10. Sketch a graph of the situation. Label the horizontal axis. Mark the hypothesized mean and the sample mean $\bar{x}$. Shade the area corresponding to the p-value.



11. Find the p-value: _____

12. At a pre-conceived $\alpha = 0.05$, what is your:
   a. Decision:
   b. Reason for the decision:
   c. Conclusion (write out in a complete sentence):

DISCUSSION QUESTION

13. Does it appear that the average jail time spent for first time convicted burglars has increased? Why or why not?