HYPOTHESIS TESTING: TWO MEANS, PAIRED DATA, TWO PROPORTIONS: PRACTICE 1; TWO PROPORTIONS

STUDENT LEARNING OUTCOMES:

- **THE STUDENT WILL EXPLORE THE PROPERTIES OF HYPOTHESIS TESTING WITH TWO PROPORTIONS.**

GIVEN:

In the 2000 Census, 2.4 percent of the U.S. population reported being two or more races. However, the percent varies tremendously from state to state. (http://www.census.gov/prod/2001pubs/c2kbr01-6.pdf) Suppose that two random surveys are conducted. In the first random survey, out of 1000 North Dakotans, only 9 people reported being of two or more races. In the second random survey, out of 500 Nevadans, 17 people reported being of two or more races. Conduct a hypothesis test to determine if the population percents are the same for the two states or if the percent for Nevada is statistically higher than for North Dakota.

HYPOTHESIS TESTING: TWO PROPORTIONS

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 is the Random Variable of interest for this test?

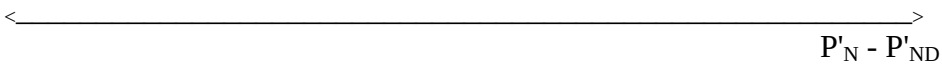
5. In words, define the Random Variable for this test.

6. Which distribution (Normal or student-t) would you use for this hypothesis test?

7. Explain why you chose the distribution you did for (6).

8. Calculate the test statistic. _____

9. Sketch a graph of the situation. Label the horizontal axis. Mark the hypothesized difference and the sample difference. Shade the area corresponding to the p-value.



$P'_N - P'_{ND}$

10. Find the p-value: _____

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

DISCUSSION QUESTION

12. Does it appear that the proportion of Nevadans who are two or more races is higher than the proportion of North Dakotans? Why or why not?