Classroom Activity 6 Math 113 Name : _____
10 pts Intro to Applied Stats

Materials Needed:

Bags of candy.

Instructions:

Do NOT look into the bag until instructed to do so.

1. Without looking, reach into the bag and withdraw one piece of candy and record the color of the wrapper (you may abbreviate the colors) in the table below. Replace the candy into the bag and repeat this process 49 more times so that you have a total of 50 trials.

2. Create a frequency distribution and a probability (proportion) distribution of the flavors of the candies in your bag based on your results. Finally, convert your proportions into percents (proportions are just the decimal form of percents). Then open your bag and record the actual number of each flavor.

Flavor (color)	Orange (orange)	Strawberry (pink)	Cherry (red)	Lemon (yellow)	Total
Frequency					50
Proportion					1.00
Percent					100%
Actual					

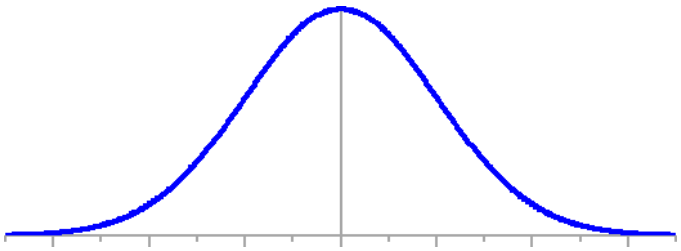
3. If you repeated this entire process again with the same bag of candy, would you expect to get exactly the same results? Would you expect to get similar results? Explain your answer.

4. Construct a 95% confidence interval for the true proportion of strawberry candies in your bag.

   a. Find the standard error, using the formula $SE(\hat{p}) = \sqrt{\frac{\hat{p}\hat{q}}{n}}$

   b. Find the margin of error, using the formula $ME = z \cdot SE$, where z is the critical z value from table Z.

   c. Label the diagram appropriately and give the confidence interval.



5. Write a sentence that explains the confidence interval found in the last question.

6. What is the actual proportion of strawberry candies in your bag? Does your confidence interval contain that proportion?

Test the claim that 35% of the candies are strawberry.

7. Write the original claim symbolically (circle one).

$p < 0.35$ $\quad p = 0.35$ $\quad p > 0.35$

$p \leq 0.35$ $\quad p \neq 0.35$ $\quad p \geq 0.35$

8. The original claim is the (null / alternative) hypothesis.

9. Write the null and alternative hypotheses.

H_0:

H_1:

10. This is a (left / right / two) tail test.

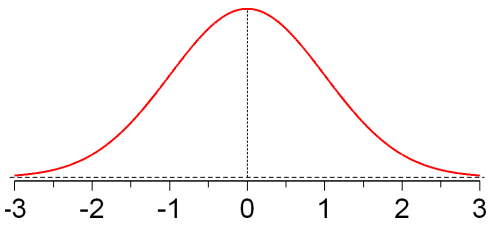
11. The significance level is $\alpha =$ _____.

12. The critical value(s) is/are _____.

13. The test statistic is _____.

14. The probability value is _____.

15. Illustrate the figure as follows.
    a. Draw and label vertical line(s) at the critical value(s)
    b. Shade and label the critical region
    c. Label the non-critical region
    d. Label the area in the critical and non-critical regions. Use α notation (example, $\alpha = 0.05$ or $\alpha / 2 = 0.025$, or $1 - \alpha = 0.95$)
    e. Identify the regions with "Reject H_0" or "Retain H_0"
    f. Draw and label a vertical line at the test statistic
    g. Label the area beyond the test statistic with the p-value.



16. The test statistic (does / does not) fall in the critical region so we (reject / retain) the null hypothesis.

17. The p-value is (less / greater) than the significance level so we (reject / retain) the null hypothesis.

18. The claimed value of 35% (does / does not) fall in the confidence interval found in question 4, so we (reject / retain) the null hypothesis.

19. The decision is to (reject / retain) the null hypothesis.

20. There (is / is not) enough evidence to (reject / support) the claim that 35% of the candies are strawberry.