Math 113: Classroom Activity 5 Name : _____
10 pts

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					

The only time you will use the actual contents of the bag is for questions 10-11. Everything else in this activity uses your sample results.

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. What is the sample proportion, $\hat{p}$, of strawberry candies?

5. Find the standard error of the proportion, $SE(\hat{p}) = \sqrt{\frac{\hat{p}\hat{q}}{n}}$.

6. What are the critical z-values for a 95% confidence interval for the population proportion?

7. Find the margin of error, $ME = CV \times SE$.

8. Add and subtract the margin of error from the center of the distribution to find the limits for the confidence interval, $\hat{p} \pm ME$.

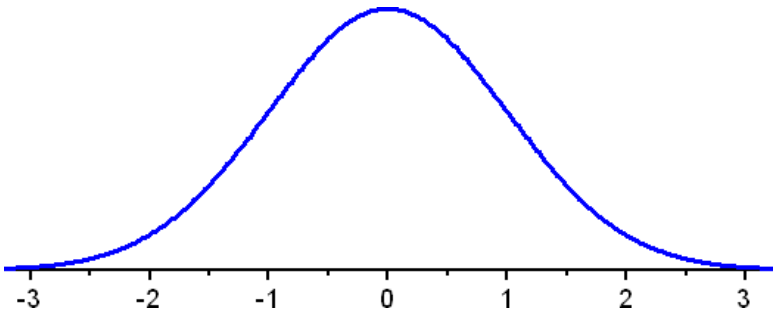
9. Write the 95% confidence interval for the true proportion of strawberry candies that are in the bag.

_____ $< p <$ _____

10. The true proportion, p, of strawberry candies in the bag is _____.

11. The confidence interval (does / does not) contain the true proportion of strawberry candies found in the bag.

12. Label the figure as described.
    a. Label the center of the axis with the sample proportion.
    b. Draw and label vertical lines at the critical z-values.
    c. Label the distance between the center and the critical values as the margin of error. Use a sideways brace ⏟ and label with ME = (the value)
    d. Write the limits of the confidence interval beneath the critical values.



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

13. The claimed value of 35% (does / does not) fall in the confidence interval.

14. The confidence interval contains the values that are believable. Based on our sample, we (would / would not) believe the claim that 35% of the candies are strawberry.

15. Use the assumed proportion $p = 0.35$ to find the test statistic $z = \dfrac{\hat{p} - p}{\sqrt{pq/n}}$.

16. Complete the following table using the test statistic.

test statistic	area to left	area to right	twice smaller area
z =			= p-value

17. The p-value is the likelihood of getting your results if 35% of the candies really are strawberry. If the p-value is less than 0.05, then it is unlikely that 35% of the candies are strawberry. Is there enough evidence to say the instructor is wrong?