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

Materials Needed:
      Scale

Instructions:
      Do all work in the metric system

1.   M&M/Mars claims that there are _____ grams of candy in each bag.

2.   What are some problems that could be encountered with your measurement of the
        mass of the candy? What could be done to remedy that? Decide how you're going
        to perform the measurement to get an accurate reading.

For your bag of candy, measure the following and record.

3.   The mass, in grams, of the candy (not including the bag): _____

4.   The composition of the bag in terms of type of number of pieces

Flavor	Red	Orange	Yellow	Green	Blue	Brown	Total
Number							

5.   Gather the results from the rest of the students. Record all (including your) masses
        below.

6.   Record the combined compositions of candy in the tables:

Flavor	Red	Orange	Yellow	Green	Blue	Brown	Total
Number							

We will be working with the claimed mass of the candy at this point. Save the other data for another activity.

The original claim is that there is a certain amount of candy in each bag. Since a sample of size one is statistically useless, we'll instead test the claim that the mean of our bags is that amount.

7.   Summarize the sample:

n	$\overline{x}$	s

8.   When performing hypothesis testing, there are assumptions that are made. One of those concerns normality of the data. That condition is met in one of three ways. Which way is appropriate for our sample?

    a.   The mass of candies is normally distributed (use qq-plot to check)
    b.   The sample size is at least 31, so the central limit theorem applies.
    c.   The expected frequency of each category is at least five.

9.   If you answered that the mass of the candies was normally distributed (answer a) to the last question, perform a normal probability plot and check our data to see if it really is normally distributed. The data (does / does not) appear normally distributed.

10.   Write the original claim symbolically.

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

12.   Write the null and alternative hypotheses.

    a. H_0 :

    b. H_1 :

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

14. The level of significance is $\alpha = $ _____.

15. When testing a claim about a mean, there are two distributions that can be used. If the sample is large or the population variance is known, the normal distribution is used, otherwise the Student's t distribution is used. In this problem, we'll use the (normal / Student's t) distribution.

16. The formula for the test statistic is $\left(\ z = \dfrac{\overline{x} - \mu}{\sigma / \sqrt{n}} \ \middle/ \ t = \dfrac{\overline{x} - \mu}{s / \sqrt{n}} \ \right)$

17. If you indicated we are using the Student's t distribution, then the degrees of freedom is _____.

18. The value of the test statistic for this sample is _____.

19. The critical value(s) for this experiment is/are _____.

20. The probability value is _____.

21. The test statistic (does / does not) fall in the critical region.

22. The decision is to (reject / fail to reject) the null hypothesis.

23. There is (sufficient / insufficient) evidence at the _____ level of significance to (reject / support) the claim that the mean amount of candy in each bag is _____ grams.

24. There is (sufficient / insufficient) evidence at the _____ level of significance to (reject / support) the claim that the mean amount of candy in each bag is not _____ grams.

25. Construct a 95% confidence interval for the true population mean for the weight of all bags of M&M Peanut candies.

26. The claimed value (does / does not) fall inside the confidence interval.