Math 148 Quiz Eleven Version C

Name:

Answer the following questions:

1. (7 pts)Johnson's Candy store has been selling candy for the past 20 years. Over the years, a basket of toffee has weighed an average of .5 pounds. Recently, Johnson's switched to a different type of sugar. The first 12 batches of the new candy weighed an average of .7 pounds with a standard deviation of .3 pounds. Can the difference in the weight be explained by chance variation? Include the null and alternative hypotheses in your answer.

Null Hypothesis: The average of the twelve measurements $= 0.5$
Alternative Hypothesis: The average of the twelve measurements $\neq 0.5$
The SD of the measurements $= 0.3$
The SD^+ of the measurement $= 0.31$
The SE for the average $= \sqrt{12}\times SD^+/12 = 0.089$
The test statistic t$= \frac{0.7-0.5}{0.089} = 2.247$
The degree of freedom $= 11$
Check the t-table, the P-value is between 2.5% and 1%.
Then, we will reject the null hypothesis.

2. (8 pts)At Binghamton university, a survey was given to 100 sophomores in 1986 and then again in 2004. In 1986, the survey found that the average freshman GPA was 3.0 with a standard deviation of .5. In 2004, the survey found that the average freshman GPA was 3.2 with a standard deviation of .5. Do a hypothesis test to determine whether the difference in GPA scores is due to chance. State the null and alternative hypotheses in your answer.

Null Hypothesis: The two averages should be equal.
Alternative Hypothesis: The two averages should not be qual.
The SE_1 for the first sample $= 0.5/\sqrt{100} = 0.05$
The SE_2 for the second sample $= 0.5/\sqrt{100} = 0.05$
The SE for the difference $= \sqrt{SE_1^2 + SE_2^2} = 0.07$ The test statistic z$= \frac{0.2-0}{0.07} = 2.857$
Check the z-table, the P-value is less than 1%.
Then, we will reject the null hypothesis.