

STAT2110 Section 8-3 Homework

Name: _____

PLEASE SHOW ALL OF YOUR WORK (all 6 steps) IN ORDER TO GET FULL CREDIT!

1. A survey of 427 women showed that 29% of them purchase books online. Test the claim that more than 25% of women purchase books online. Use a significance level (alpha) of 0.1.

2. The Mars candy company claims that less than 15% of M&Ms in a package are brown. A sample of 100 M&Ms had 14 brown candies. Using a significance level of 0.01, test the company's claim. Once you have completed your hypothesis test, find the 99% confidence interval of the population proportion and compare your results.

$n = 100$ $\alpha = .01$ $\hat{p} = \frac{14}{100} = .14$ $H_0 = p = .15$ $H_1 = p < .15$
 $z = \frac{\hat{p} - p}{\sqrt{\frac{pq}{n}}} = \frac{.14 - .15}{\sqrt{\frac{.15(.85)}{100}}} = \frac{-0.01}{\sqrt{0.001275}} = \frac{-0.01}{0.0357} = -0.28$

 $z = -2.33$

3. A current survey reveals that 62% of college students dislike statistics. Wahba-Saba StatTutors Inc. claims that using its services will change the proportion of students who dislike statistics. After using the services, 26 out of 50 students stated that they disliked statistics. Use a significance level of 0.05 to test the company's claim.

$\hat{p} \pm E$
 $E = z^* \sqrt{\frac{\hat{p}\hat{q}}{n}}$
 $E = 2.575 \sqrt{\frac{.14(.86)}{50}}$
 $E = 0.09$
 $.14 \pm .09$
 $.05 < p < .23$

4. When Mendel conducted his famous genetics experiments using peas, one sample of offspring consisted of 152 yellow peas out of the total 580 plants. Use a 0.1 significance level to test his claim that 25% of offspring peas will be yellow. Find the 90% confidence interval of the population proportion and compare your results.

STAT2110 Section 8-4 Homework

Name: _____

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1. A sample of 82 Oscar-winning actresses had a mean age of 35.9 years when they won the award. $s = 11.1$ years. Use a 0.01 significance level to test the claim that the mean age of actresses when they win an Oscar is greater than 33 years. Once you have your conclusion, find the 99% confidence interval of the mean age and compare your results.

2. A sample of 106 body temperatures was taken and the mean was 98.2 degrees F. The population standard deviation is 0.62 degrees. Use a 0.05 level of significance to test the claim that the average body temperature is actually different than 98.6 degrees F. Find the 95% confidence interval of the mean temperature and compare your results.

3. When 40 people used Weight Watchers for one year, their mean weight loss was 3.0 lbs and their standard deviation was 4.9 lbs. Use a 0.01 level of significance to test the claim that the mean weight loss is greater than 0 lbs. Based on your results, does the diet appear to be effective? Does it have practical significance?

4. Find the 99% confidence interval for the mean weight loss from number 3. Compare your results.

SHOW ALL OF YOUR WORK (ALL 6 STEPS) TO GET FULL CREDIT!

1. Workers at a certain soda drink factory collected data on the volumes (in ounces) of a simple random sample of 18 cans of the soda drink. Those volumes have a standard deviation of 0.09oz, and they appear to be from a normally distributed population. The workers determine that the standard deviation should be less than 0.16oz. Use the sample data to test the claim that the population of volumes has a standard deviation less than 0.16oz. Use a significance level of 0.05.

2. In order for turkeys to be packaged as a certain weight, the variance of their weights must be equal 2.6lbs. If 30 turkeys have a variance of 2.91lbs, can we conclude that the population variance is different than 2.6lbs? Use a significance level of 0.1.

3. A certain school tries to place students of the same academic level in the same classes. In order for this to work, the standard deviation of the students' scores must be approximately 4.1. A school board member thinks that the school is not doing a good job and claims that the standard deviation is higher than 4.1. A sample of 27 students in a class is tested and their standard deviation was found to be 4.3. Using a significance level of 0.01, test the school board member's claim.