

Pledge:

3/19/2008
Dr. Lunsford

MATH 171
Quiz 3

Name: _____
50 Points Possible

Please show all work on this quiz. Please be sure to **show all calculator input. No calculator input shown means no credit** (even if you have the correct answer!).

Problem I. The weight of potato chips in a medium sized bag can be modeled with a normal distribution with mean 10.2 ounces and standard deviation 0.12 ounces. The label weight on the bags is 10 ounces. (10 points total)

- (a) What percent of all bags sold are under label weight (i.e. under 10 ounces)? (5 points)
- (b) Some of the chips are sold in bargain packs of 4 bags. What is the percent chance the mean weight of the bags in a bargain pack is less than 10 ounces? (5 points)

Problem II. Data collected by a child development scientist produced a 95% confidence interval for the mean age, μ (in weeks), at which babies begin to crawl as $20.2 < \mu < 31.8$. Please answer the following: (8 points total)

- (a) What is the margin of error for the confidence interval? (4 points)
- (b) How would the margin of error for the confidence interval be affected if the confidence level was reduced to 90%? (4 points)

Problem III. Suppose we want to compute a 92.4% confidence interval for a population mean. What is the critical value (i.e. value of z^*) we would need to use? (5 points)

Problem IV. Property taxes for residents in a small city are based on assessment records, some of which have not been updated in a long time. Assessment records indicate that the value of homes in the city is skewed right, with a mean of \$140,000 and a standard deviation of \$60,000. To check the accuracy of the assessment records, officials plan to conduct a detailed appraisal of 100 homes selected at random. Please answer the following: (15 points total)

- (a) Draw and label the sampling distribution of the average home value for samples of size 100 from this population. (6 points)
- (b) Suppose the 100 homes selected had a mean appraisal value of \$160,000. Find a 95% confidence interval for the mean appraisal value of all homes in the city. (5 points)
- (c) Based on your answer to part (b), do you think the city needs to update its assessment records? Why or why not? (4 points)

Problem V. Based on meteorological data for the past century for this region, a local TV weather forecaster estimates that the region's average winter snowfall is 23'' with a margin of error of ± 2 inches. Assume she used a 95% confidence interval. For each statement below, please write "true" or "false," according to which is correct, in the blank provided by the statement. (3 points each – 12 total)

- _____ During 95 of the last 100 winters, the region got between 21'' and 25'' of snow.
- _____ There is a 95% chance the region will get between 21'' and 25'' of snow this winter.
- _____ Residents can be 95% sure that the area's average snowfall is between 21'' and 25''.
- _____ The average amount of snowfall for the past century for this region was 23''.