92283 209, 210 Homework 3

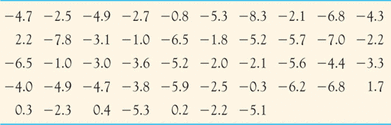
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By submitting this home work for grading I am acknowledging that the work was completed by me without discussing or seeking help from others. I understand that any questions I may have must be directed to the course instructor. I further understand if this homework is submitted and it is found that any of the work is not solely my own that I am in violation of the University’s Academic Integrity Policy which can result in the disciplinary action outlined in it.

Signature\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show all analytic work for all problems and indicate the technology is used

**Bone loss by nursing mothers.** (reference: problem 16.26, Book p388) Breastfeeding mothers secrete calcium into their milk. Some of the calcium may come from their bones, so mothers may lose bone mineral. Researchers measured the percent change in mineral content of the spines of 47 mothers during three months of breastfeeding. Here are the data:



The researchers are willing to consider these 47 women to be an SRS from the population of all nursing mothers. Suppose that the percent change in this population has a Normal distribution with standard deviation *σ* = 2.5%.

1. (30 points) Make a Histogram of the data to verify that the data follow a Normal distribution quite closely, where the classes represent the bone mineral percent change and the frequency is the number of mother whose bone mineral percent change that fall into each of the class intervals. Give a brief comment on the distribution.
2. (30 points) Perform confidence interval calculation

2A. Calculate the mean percent change of bone mineral.

2B. What is the 95% confidence interval for the percent change of bone mineral?

1. (40 points, reference: problem 17.41, Book p413) Suppose that the percent change in this population has a Normal distribution with standard deviation *σ* = 2.5%. Do these data give good evidence that, on the average, nursing mothers lose bone mineral?

3A State the null and alternative hypothesis in order to determine if the nursing mothers lose bone mineral?

3B Perform the test at a level of significance α = 0.05 and state your conclusion. Show all statistics to support your conclusion