

Pledge: Please be sure to sign your name to pledge!

9/18/2007
Dr. Lunsford

MATH 171
Quiz 2

Name: Solution
25 Points Possible

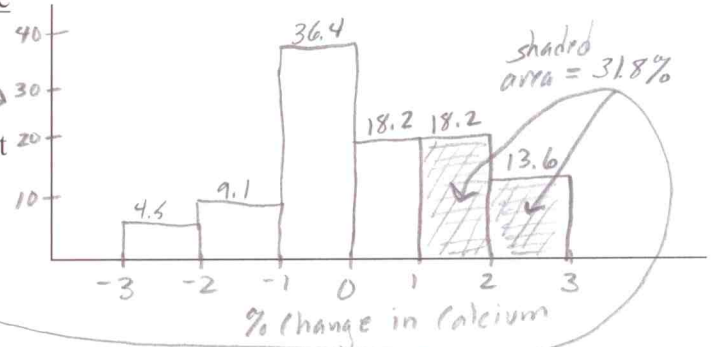
Problem I. Researchers compared 47 breast-feeding women with 22 women of similar age who were neither pregnant nor lactating. They measured the percent change in the calcium content of the women's spines over three month. Below are the data for the 22 women who were neither pregnant nor lactating. For your convenience the data have been sorted from smallest to largest. (13 points total)

-2.2 | -1.6 -1.5 | -0.6 -0.4 -0.4 -0.4 -0.2 -0.1 -0.1 -0.1 |
0 0.3 0.7 | 0.9 | 1 1.1 1.2 1.7 | 2.2 2.4 2.9

(a) To your right is a frequency table for the data using 6 classes. I have given you the class boundaries using the convention we discussed in class. Note that the variable X is percent change in the calcium content of the women's spines over three month. Please use the data above to complete the table. (3 points)

Class Limits For X	Number of Women	Percent of Women
$-3 \leq X < -2$	1	4.5
$-2 \leq X < -1$	2	9.1
$-1 \leq X < 0$	8	36.4
$0 \leq X < 1$	4	18.2
$1 \leq X < 2$	4	18.2
$2 \leq X < 3$	3	13.6

(b) Use the frequency table to graph a percent frequency histogram (i.e. graph the percent of women on the vertical axis) on the axes provided below. Be sure to label your axes! (3 points)



(c) What percent of the women had a percent change in their calcium content of their spine of at least one percent? Shade the area on the histogram that corresponds to this percent. Clearly indicate this on the histogram. (2 points)

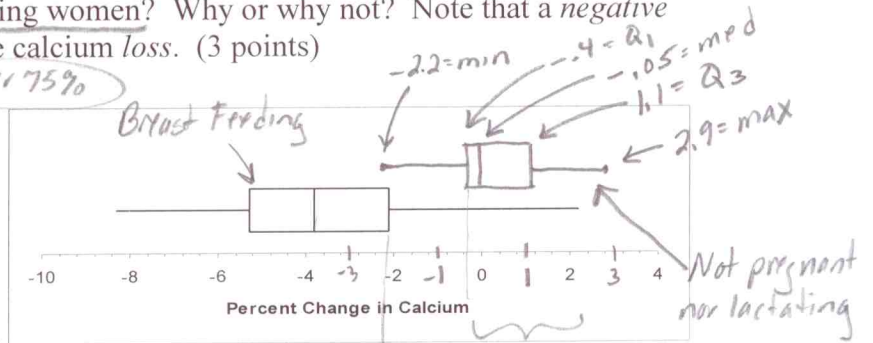
$\frac{7}{22} = .318$ or $18.2\% + 13.6\% = 31.8\%$

(d) Find the five number summary for this data. Clearly indicate your answers. (2 points)

min = -2.2 med = -0.05 max = 2.9
Q₁ = -0.4 Q₃ = 1.1

(e) Below is a box plot of the percent change in the calcium content in the spine for the 47 women who were breast feeding. Draw the boxplot for the the 22 women who were neither pregnant nor lactating on the same scale in the space provided above the given boxplot. Based on the boxplots, do you believe the data show distinctly greater bone calcium loss among the breast-feeding women? Why or why not? Note that a negative percent change corresponds to bone calcium loss. (3 points)

Yes. The vast majority of the breast feeding women had a loss of 2% or greater whereas the non-breast feeding women generally showed little to no loss or a small gain.
Breast Feeding: Centered around loss of 4%
Non Breast Feeding: Centered around loss of 0%
loss of 2% or greater



Note: Since these data are sorted you do not need a calculator to find these numbers!

