

Pledge:

9/18/2007
Dr. Lunsford

MATH 171
Quiz 2

Name: _____
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)

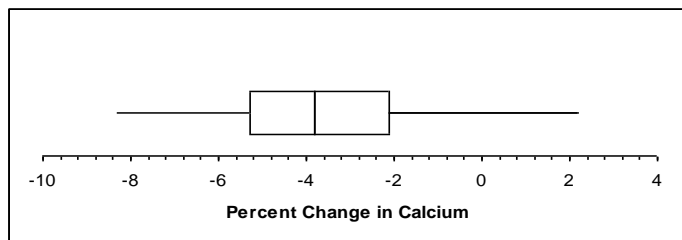
Class Limits For X	Number of Women	Percent of Women
$-3 \leq X < -2$		
$-2 \leq X < -1$		
$-1 \leq X < 0$		
$0 \leq X < 1$		
$1 \leq X < 2$		
$2 \leq X < 3$		

(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)

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

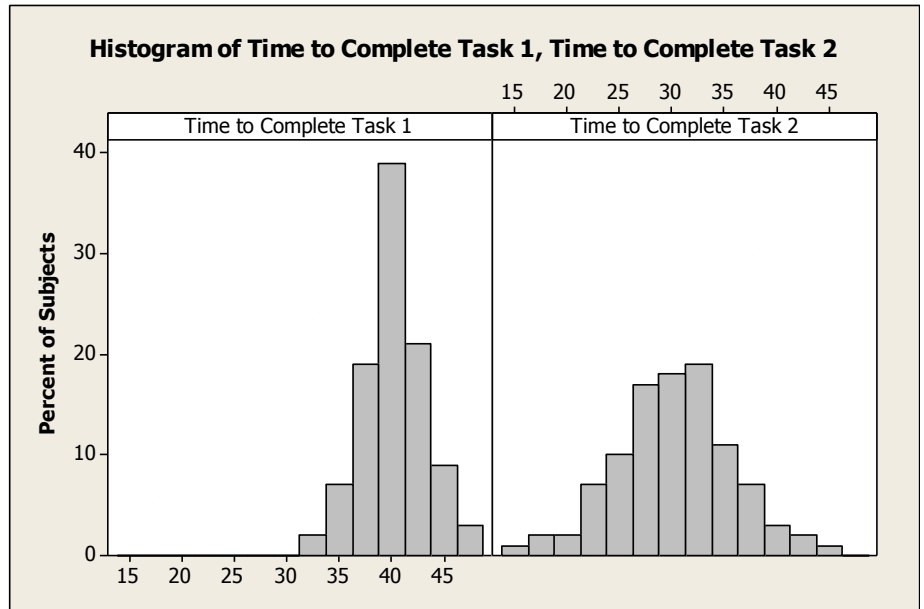
(e) Below is a box plot of the percent change in the calcium content in the spine for the 47 women who were breast feeding. Draw the boxplot for the the 22 women who were neither pregnant nor lactating on the same scale in the space provided above the given boxplot. Based on the boxplots, do you believe 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)



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Problem II. One hundred subjects were timed (in minutes) as they completed two tasks, Task 1 and Task 2. Below are the histograms of the distributions of the times to complete each task. Notice that the histograms are graphed using the same horizontal and vertical scales. Please answer the following: (2 points each, 4 points total)

(a) Which task has a shorter mean completion time? What is that mean time, approximately (i.e. estimate the mean time from the histogram)?



(b) Which task has the smaller standard deviation? Why?

Problem III. The distribution of scores on an IQ test can be modeled with a normal distribution with mean 100 and standard deviation 15. Please answer the following being sure to show all calculator input. (8 points)

(a) Draw a graph of the distribution. Be sure to draw the distribution with proper shape, label your axis, and show variable values at ± 1 , ± 2 , and ± 3 standard deviations from the mean. (3 points)

(b) Suppose the organization MENSA requires an IQ score of 132 or higher for membership. What percent of adults would qualify for membership via this IQ test? Clearly represent this percent graphically on the distribution drawn in part (a). (3 points)

(c) What IQ score corresponds to a z-score of -1.65? (2 points)