9/12/2008 MATH 171 Name: Solution
Dr. Lunsford In-Class Quiz 1 40 Points Possible

Problem I. A sample of 25 employees from the local manufacturing plant was obtained and the length of time (in months) worked was recorded for each employee. Below are the data for the 25 employees. For your convenience the data have been sorted from largest to smallest. (17 points total)

52 59 59 60 61 62 63 65 66 67 67 68 69
72 73 73 74 74 75 79 79 80 83 86 94

(a) To your right is a frequency table for the data using 9 classes. I have given you the class boundaries using the convention we discussed in class. Note that the variable X is the length of time worked (in months). Please use the data above to complete the table. (5 points)

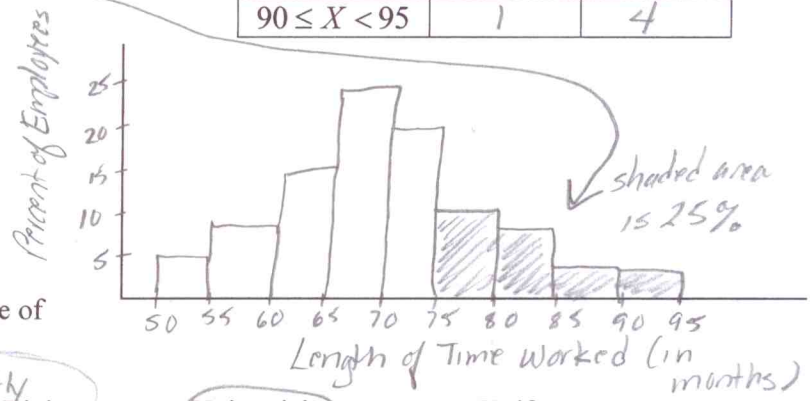
Class Limits For X	Number of Employees	Percent of Employees
$50 \le X < 55$	1	4
$55 \le X < 60$	2	8
$60 \le X < 65$	4	16
$65 \le X < 70$	6	24
$70 \le X < 75$	5	20
$75 \le X < 80$	3	12
$80 \le X < 85$	2	8
$85 \le X < 90$	1	4
$90 \le X < 95$	1	4

(b) Use the frequency table to graph a *percent* frequency histogram (i.e. graph the percent of employees on the vertical axis) on the axes provided below. Be sure to label your axes! (4 points)

(c) What percent of the employees have worked at the plant for at least 75 months? Shade the area on the histogram that corresponds to this percent. Clearly indicate this on the histogram. (3 points) $\frac{7}{25} = .28$ 28%

(d) Find the five number summary for this data. Clearly indicate your answers. (3 points)

min = 52
$Q_1 = 62.5$
med = 69
$Q_3 = 77$
max = 94



(e) Circle all words below that describe the shape of this distribution: (2 points)

Symmetric Skewed Left Skewed Right Unimodal Uniform

OR Slightly

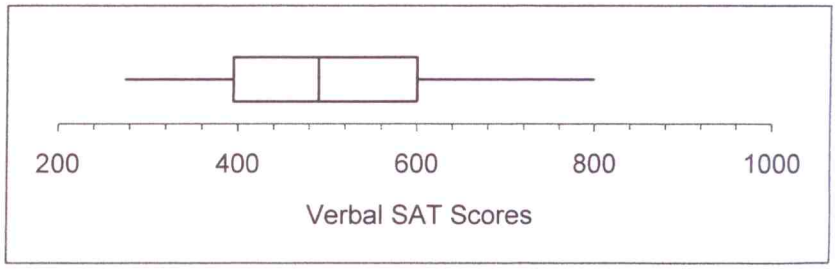
Problem II. A sample was taken of the verbal SAT scores of applicants to a California State College. Below is a boxplot of the scores. Use the boxplot the answer the following. (2 points each, 4 total)

1. Based on this boxplot, the interquartile range of the scores is closest to (circle one)

a. 200 b. 400 c. 500 d. 600.

2. About 25% of the applicants had SAT verbal scores exceeding what score?

600



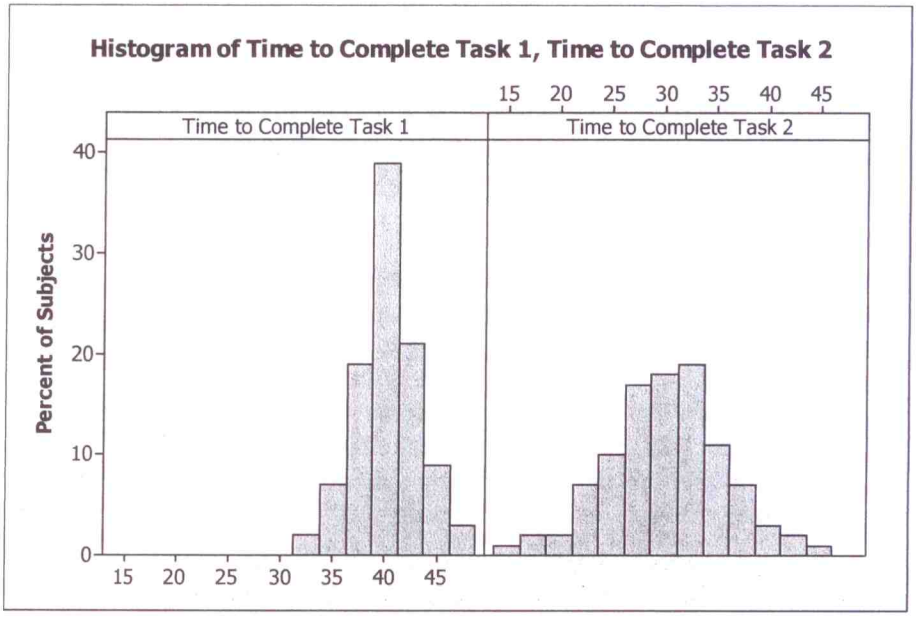
Problem III. One hundred subjects were timed (in minutes) as they completed two tasks, Task 1 and Task 2. Below are the histograms of the distributions of the times to complete each task. Notice that the histograms are graphed using the same horizontal and vertical scales. Please answer the following: (3 points each, 6 points total)

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

Task 1. The mean time is approx. 40 min.

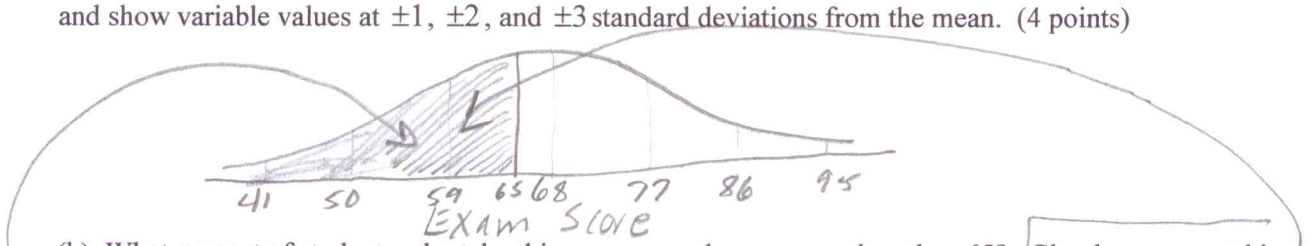
(b) Which task has the larger standard deviation? Why?

Task 2 has the larger standard deviation b/c it has more data further from the mean.



Problem IV. The distribution of scores on a University entrance exam can be modeled with a normal distribution with mean 68 and standard deviation 9. Please answer the following being sure to show all calculator input. (13 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. (4 points)



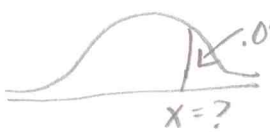
(b) What percent of students who take this exam score have a score less than 65? Clearly represent this percent graphically on the distribution drawn in part (a). (3 points)

normalcdf(-1E99, 65, 68, 9) = .369 → 37%

(c) What exam score corresponds to a z-score of -2.3? (3 points)

$-2.3 = \frac{x-68}{9} \Rightarrow x = 47.3$

(d) Suppose the university gives scholarships to those who score in the top 7%. What scores constitute this range? (3 points)



invNorm(.93, 68, 9) = 81.28

Scores of 81.28 or higher are in the top 7%.