Mthsc 301: Statistical Methods
Test 1
Closed Book/Notes

September 21, 1999

Each question is worth 20 pts.

1. The following is a data set obtained in a study of recovery times after a surgery (in hours).

   53, 54, 60, 59, 53,
   53, 52, 56, 55, 52,
   57, 51, 46, 53, 59,
   58, 63, 49, 63, 47,
   50, 53, 55, 53, 52.

   (a) Using 5 classes draw a relative frequency histogram for this data

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(b) Approximately what % of patients have recovery times less than 45 hours?

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(c) Monthly gas bills for a few families were collected and the following numbers were reported. Find the mean, standard deviation, median, quartiles and draw a box plot. Determine whether there were any outliers. 114, 13, 107, 108, 66//

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(d) The attached figure gives side by side box plots for the % of Nitrogen Dioxide (a lethal air pollutant) discharge (per liter) for two types of engines, A and B. Based on these plots

i. Type A engines would generally have less pollution compared with type B. Would you agree? Why?

ii. About 50% of type A engines would discharge less than 2% of Nitrogen Dioxide.Would you agree? Why?

iii. The distribution of the % of discharge in type B is skewed to the right. True or False?

(e) Find the following:

i. $P[1.22 < Z]$

ii. $P[1.35 < Z < 1.48]$

iii. $P[Z < -1.18]$

iv. Find c such that $P[Z > c] = 0.025$

(f) The birth weights of children are normally distributed with a mean of 8 pounds and a standard deviation of 1.15 pounds.

i. What is the probability that a newborn would weigh more than 9 pounds?

ii. What is the probability that a newborn would weigh less than 7.5 pounds?

iii. What is the probability that a newborn would weigh between 6 and 9 pounds?

iv. Find the number c such that top 30% of the birth weights would be above it.