Mthsc 302 Test 1

1. The lifelengths of eight hydraulic pressure systems were measured (in thousands of hours) as 3.2,2.8,5.1,4.9,3.6,2.9,4.8 and 4.0.

   (a) Find s for these data

   (b) Find $q(0.25)$ and $q(0.75)$

   (c) Draw a box plot for these data

2. A study was conducted to investigate the yield of a chemical process at two different temperatures and three different mixing types. At each temperature/mixing type combination 3 replicate observations were obtained. Tables of sample means is given below.

   Sample Means

		Mixing Type			
		1	2	3	
Temperature	300° C	30	32	28	30
	400° C	40	35	30	35
		35	33.5	29	32.5

   (a) Write an appropriate model for these data assuming no interaction

   (b) Estimate the parameters of the model.

3. At a small college students are given an entrance exam. The administration is interested in whether a student's GPA can be predicted from their test score. Below are data from 10 students.

student:	1	2	3	4	5	6	7	8	9	10
Score:	5.5	4.8	4.7	3.9	4.5	6.2	6.0	5.2	4.7	4.3
GPA	3.1	2.3	3.0	1.9	2.5	3.7	3.4	2.6	2.8	1.6

   The summary statistics are:

   $\Sigma x = 49.8 \quad \Sigma Y = 26.9 \quad \Sigma(x-\bar{x})^2 = 4.896 \quad \Sigma(x-\bar{x})(Y-\bar{Y}) = 3.788 \quad \Sigma(Y-\bar{Y})^2 = 3.809$

   (a) Find the equation of the least squares regression line.

   (b) Calculate R^2 and explain what it indicates.

   (c) Predict the GPA for a test score 6.1.

4. 5% of all items produced by a production line are defective. If 5 randomly selected items are inspected, what is the probability that

   (a) exactly one is defective

   (b) at most four are defective