Fall 04 Name: _____

Math 3770 Test 1 Bonetto

1) The following number represent a sample of size $n = 19$ form a given population.

0.985	0.645	0.118	0.894	0.784	0.101	
0.253	−0.321	1.832	0.378	0.679	0.681	
0.753	0.006	0.624	−1.104	0.273	0.126	0.618

a) Compute the sample median and fourth spread.

b) Knowing that $\sum_{i=1} x_i = 8.325$ and $\sum_{i=1} x_i^2 = 10.063$, compute the sample mean and variance.

c) Are there outlier? Extreme outlier?

d) Draw a box plot of the data.

e) You want to draw an histogram of the above data. How many calsses would you use?

2) In a university every semester 20 students enroll for the honour calculus class for the first time. Each of them as a probability $p = 0.9$ to pass the exam. If they do not pass the exam, they will enroll again in the same class the following semester. In this case it is observed that the probability of passing the exam is $q = 0.6$, i.e. 60% of the students that fail the exam the first time they try will pass it at the second time. If they fails the exam for the second time, they have to drop the class.
   a) What is the probability that among the students that enroll for the first time in a given year exactly 4 fail the exam the first time they try it?

   b) What is the average number of students that fail the exam the first time they try it?

   c) What is the probability that among the students that enroll for the first time in a given year exactly 4 will fail the exam twice?

   d) What is the average number of students that fail the exam twice?

Every semester the student attending the class will be formed by the 20 students that just enrolled plus the students that failed the exam the previous semester. Suppose that 3 students failed the exam the previous semester.

e) Choosing at random a student in the class, what is the probability that he already tried the exam once?

f) You chose one of the 23 student in the class and observe that he passes the exam, what is the probability that he already tried the exam once?

3) In a bowl there are 10 red balls, 20 green and 30 blue. You randomly chose 9 out of them without reinsertion.
   a) find the probability that 4 of the 9 chosen balls are red.

   b) find the probability that 6 of the 9 chosen balls are red or green.

   c) find the probability that 3 of the 9 chosen balls are red, 3 are blue and 3 are green.