Stat 254 Assignment One

Name:_____

Assignments must be completed on this paper. Marks may be deducted for not showing all your work.

1. [3 marks] The data set below represents house prices in a certain city.

Price ($)	Relative Frequency
400,000	0.1
600,000	0.45
800,000	0.25
1,000,000	0.15
1,200,000	0.05

a) Calculate the mean and the median.

b) Based on the mean and the median, in which direction is the data skewed?

2. [4 marks] A data set has 1200 measurements, a mean of 65, and a standard deviation of 7. What can you say about the number of measurements that are less than 37?

3. [2 marks] Construct a data set with two measurements which has a mean of 83 and a population variance of 16. Show your work.

4. [3 marks] If the data has a linear relationship, find the equation of the least squares regression line. Round your values to one decimal place. If the data does not have a linear relationship, write *nonlinear*.

a)

x	1.1	1.6	0.8	0.7	1.9	1.2
y	-2.5	-2.7	-5.6	-5.1	-2.2	-4.9

b)

x	3.4	3.7	2.9	2.6	2.7	2.2
y	8.2	8.5	7.5	5.1	8.3	7.1

5. [4 marks] A lab has two smoke alarms. 98.8% of fires are detected by Alarm A; 98.4% of fires are detected by Alarm B; 0.7% of fires are detected by Alarm A but not Alarm B. Find the probability that a fire is detected by:

a) both alarms

b) at least one alarm

c) neither alarm

6. [3 marks] A coin is tossed eight times. Find the probability that the first three tosses are heads or the last toss is tails. Round your answer to two decimal places.

7. [3 marks] Ten percent of all cars are red. Of the red cars, 1.5% are convertibles. Of the non-red cars, 1.8% are convertibles. Find:

a) The probability that a red car is not a convertible

b) The probability that a convertible is not red

8. [3 marks] 12 deep-water and 18 shallow-water samples are drawn from the inner harbour. Four samples are randomly selected for further testing. Let X be the number of deep-water samples selected.

a) Find the probability distribution of X. Round the probabilities to two decimal places.

b) Find the expected value of X