

**Problem 1.**  
For these data

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7 6 6 11 8 9 11 9 10 8 7 7 5  
9 10 7 7 7 7 9 12 10 10 8 6

- (a) Compute the mean (1/4)
  
- (b) Compute the median (1/4)
  
- (c) Compute the mode (1/4)
  
- (d) The range (1/4)
  
- (e) The variance (1/4)
  
- (f) Compute the standard deviation (1/4)
  
- (g) Compute the interquartile range (1/4)
  
- (h) Count the number of measurements in the intervals  $\bar{x} \pm s$ ,  $\bar{x} \pm 2s$ , and  $\bar{x} \pm 3s$ . Express each count as a percentage of the total number of measurements. (3/4)

- (k) Compare the percentage found in part (h) with the percentage given by the empirical rule and Chebyshev's rule (1/2)
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- (l) Draw a Box plot of the data and find if there are any outliers (3/2)
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**Problem 2**

4 points

A car dealership has collected data by gender on the type of cars students want to buy. The data is given in the table below:

	Jeep	Sedan	No car preference	Total
Female	26	23	15	
Male	80	12	11	
Total				

Use this information to find

1. the proportion of students who want to buy a sedan. (1/4)

2. the proportion of students that are females. (1/4)

3. the proportion of students who want to buy a jeep and are male. (1/4)
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4. the proportion of students that are female or want to buy a sedan. (1/4)
5. the proportion of students who do not want to buy a jeep. (1/4)
6. the proportion of students who want to buy a jeep given that the student is male. (1/4)
7. Are the events Female and Jeep independent? (1/4)
8. Are the events Male and No car preference mutually exclusive? (1/4)





5. Suppose that a sample of 300 children is taken. Find

(a) the probability that more than 250 children will begin to walk before one and a half years of age. (1/2)

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(b) the probability that between 220 to 240 children will begin to walk before one and a half years of age. (1/2)

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**Problem 5.**

**4 points**

Suppose that the amount of time in minutes a student spends on their blackberry per day is Normally distributed with mean 30 and standard deviation of 8. Find

1. the probability that a student spends less than 40 minutes per day on his/her blackberry. (1/2)

2. the probability that a student spends more than 35 minutes per day on his/her blackberry.

(1/2)

3. the probability that a student spends less than 20 minutes per day on his/her blackberry.  $(1/2)$

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4. the probability that a student spends exactly 25 minutes per day on his/her blackberry.  $(1/2)$

5. the probability that a student spends between 20 to 35 minutes per day on his/her blackberry.  
 $(1/2)$

6. Suppose that a sample of 50 students is selected, what is the probability that these students spend an average between 28.5 and 31.5 minutes per day on the blackberries.  $(3/2)$

Problem 6.

5 points

1. A biologist has found that the average weight of 12 randomly selected mud turtles to be 8.7 lb with standard deviation 3.6 lb. Find a 90% confidence interval for the population mean weight of all such turtles. Assume that weight of such turtles is normally distributed. (5/2)

2. The average cholesterol level for a sample of 35 adults women from Kuwait is 236 units . The sample standard deviation is 43 units. Find a 99% confidence interval for the mean cholesterol level of all adult women in Kuwait. (5/2)



3 points

**Problem 7.**

A random sample of teachers in Kuwait showed the standard deviation of teaching experience to be 5.3 years. How many more teachers should be included in the sample to have a 95% confidence that the sample mean number of years of teaching experience is within six months of the population mean?

(3)

5 points

**Problem 8.**

1. A washing machine manufacturer says that 85% of its washers last five 5 years before repairs are necessary. A random sample of 100 washers showed that 73 of them lasted five years before they needed repair. Does this data indicate that the manufacturer claim is too high? Use a 1% significance level.

(5/2)

2. A statistics report published recently reported that the average amount a household spends annually on housing is 5000 KD. A random sample of 20 households in Al-Farwaniya had a sample mean of 4800 KD with sample standard deviation of 200 KD. Test to see if the mean expenditures in Al-Farwaniya is different from the national average. Use a 5% significance level.

(5/2)

7 points

**Problem 9.**

A study is carried out to determine if there is a relationship between the number of headaches of an individual per month is determined by the number of cups of coffee consumed per month. Data is collected on 6 individuals and is summarized in the table below.

Number of Headaches	Number of Cups of Coffee
11	18
13	36
15	40
18	50
21	58
24	74

Use this information to answer the following:

- (a) Draw a scatter plot for the data, and comment on it.

(3/2)

- (b) Find a measure for the strength and direction of the linear relationship between coffee and headaches.

(1)

- (c) Find the fitted least squares regression line for this data.

(3/2)

(d) Find the predicted number of headaches per month when the number of cups of coffee consumed is 18. (1)

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(e) Find the error of the above value. (1)

(f) Find the coefficient of determination and comment on it. (1)