Introduction to Statistics | REVIEW Assignment #1

You and your partner are required to complete the following worksheet. Show necessary work in order to earn full credit for this assignment.

1. Determine the mean and median of the following data sets:

(a) Set of Raw Data for Leila's discus throws in training

(2 marks)

22.45 m, 23.47 m, 19.58 m, 21.40 m, 22.49 m, 21.75 m, 27.03 m, 26.00 m, 24. 73 m, 24.00 m

(b) Frequency Table for Mostafa's Homework Grades this year

(3 marks)

Score on 5	Frequency
0	6
1	2
2	1
3	7
4	2
5	4

(c) Grouped Data Set for Kholood's 200m sprint training times

(3 marks)

Time Intervals	Frequency
$28 \leq t < 30$	2
$30 \leq t < 32$	5
$32 \leq t < 34$	4
$34 \leq t < 36$	8
$36 \leq t < 38$	9
$38 \leq t < 40$	2

2. Here are Joud's results from last 5 tests in Math class: 76%, 65%, 82%, 91%, and 80%.

   a. Joud has one more test to write and she would like to have a test average of 80% over her 6 tests. What should her test score be on her 6th test in order to get her test average to be 80%?

   (3)

   b. From her 6 class tests, what is the maximum test average she could get?

   (1)

3. Aly is preparing for the math Semester Exam and is worried about his math grade. His current grade in Math is 76.3% and he would like to get a B- in Math this year, so he wants at least an 80% average in Math this year. If the score on the Final Exam is weighted as 20% of the final course grade, what does Aly need to score on his Final Exam to finish with an 80% as his course grade?

   (3)

4. A random sample of 167 people who own mobile phones was used to collect data on the amount of time they spent per day using their phones. The results are displayed in the table below.

Time spent per day (t minutes)	$0 \leq t < 15$	$15 \leq t < 30$	$30 \leq t < 45$	$45 \leq t < 60$	$60 \leq t < 75$	$75 \leq t < 90$
Number of people	21	32	35	41	27	11

(a) State the modal group.

(1)

(b) Calculate approximate value of the mean of the time spent per day on these mobile phones.

(3)

(c) On graph paper, draw a fully labeled histogram to represent the data.

(4)

(d) On graph paper, draw a fully labeled cumulative frequency graph to represent the data.

(4)

(e) Using your cumulative frequency graph, determine the median of the amount of time they spent per day using their phones.

(1)

(f) Using your cumulative frequency graph, calculate the interquartile range of the amount of time they spent per day using their phones.

(2)

(g) Draw the box and whisker plot on the grid below that shows the distribution of the amount of time they spent per day using their phones.

0   30   60   90

Amount of time spent on phone

(3)
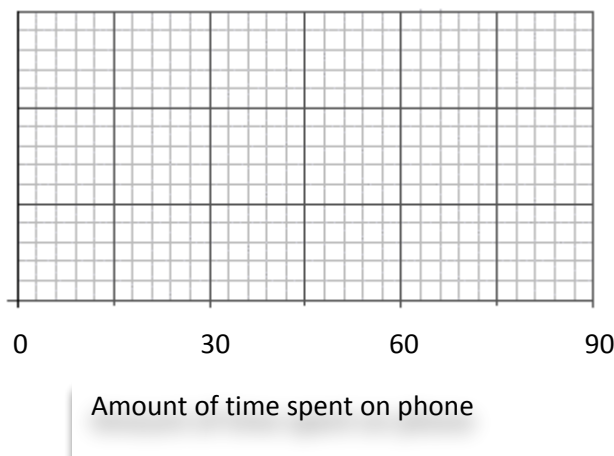
(Total 18 marks)

5. The amount of money spent by men and women at a shopping centre is shown in the tables below.

MEN:

Money spent, m (£)	Frequency	
0 < m ≤ 25	5	
25 < m ≤ 50	18	
50 < m ≤ 75	17	
75 < m ≤ 100	11	
100 < m ≤ 125	9	

WOMEN:

Money spent, m (£)	Frequency	
0 < m ≤ 25	2	
25 < m ≤ 50	13	
50 < m ≤ 75	14	
75 < m ≤ 100	19	
100 < m ≤ 125	12	

a) Calculate the cumulative frequencies   (4)

b) Draw properly labelled cumulative frequency curves for the men and women on the same axes. (4)

c) Use your curve to estimate the median, quartiles and IQR for the men and women.   (6)

d) Draw 2 box & whisker plots (one for men and one for women) on the same axes.   (4)

e) Make 4 observations/comparisons about the amount of money spent by the men and women at the shopping centre.   (4)

f) Estimate the number of men and women who spent **over** £80.   (3)

6. Draw 2 box plots on the same diagram, using the information on the length of time for 2 different types of light bulbs.   (4)

Speedy Light:
Lowest Value – 1200 hours
Lower Quartile – 1500 hours
Median – 1700 hours
Upper Quartile – 1800 hours
Range – 1600 hours

Ultrabulb:
Lowest Value – 1050 hours
Median – 1400 hours
Upper Quartile – 1900 hours
Range – 1100 hours
Interquartile range – 750 hours

a) Look at the medians and interquartile ranges as illustrated in your B/W plot. Use these to compare the different types of bulb. Which would you be most likely to use and why?   (4)

b) What is the probability of a random Speedy Light bulb lasting more than 1800 hours?   (2)

7. Working with Misrepresentations. Answer the following questions on a separate paper.

3. Median Earnings The following graph shows the median
NW earnings for females from 2002 to 2006 in constant 2006
dollars.

Source: U.S. Census Bureau, Income, Poverty, and Health
Insurance Coverage in the United States, 2006

Median Earnings for Females
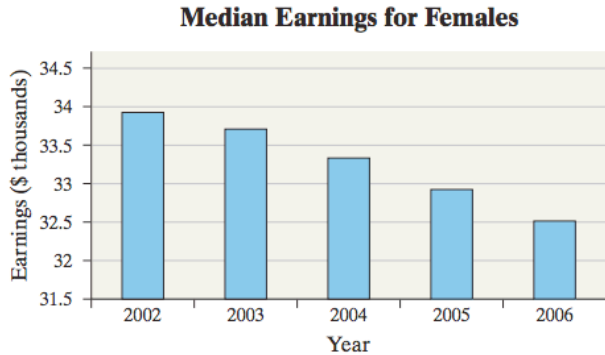
(a) How is the bar graph misleading? What does the graph
seem to convey?
(b) Redraw the graph so that it is not misleading. What does
the new graph seem to convey?

8. New Homes The following time-series plot shows the num-
ber of new homes built in the Midwest from 2000 to 2006.
Source: U.S. Statistical Abstract, 2008

New Homes in Midwest
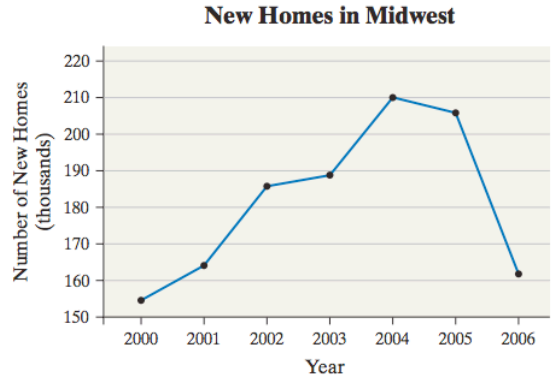
(a) Describe how this graph is misleading.
(b) What is the graph trying to convey?
(c) In January 2006, the National Association of Realtors
reported, "*A lot of demand has been met over the last five
years, and a modest rise in mortgage interest rates is caus-
ing some market cooling. Along with regulatory tighten-
ing on nontraditional mortgages, there will be fewer
investors in the market this year.*" Does the graph support
this view? Explain why or why not.

9. Median Income The following time-series plot shows the
median household income for the years 2001 to 2006 in con-
stant 2006 dollars.
Source: U.S. Census Bureau

U.S. Median Household Income
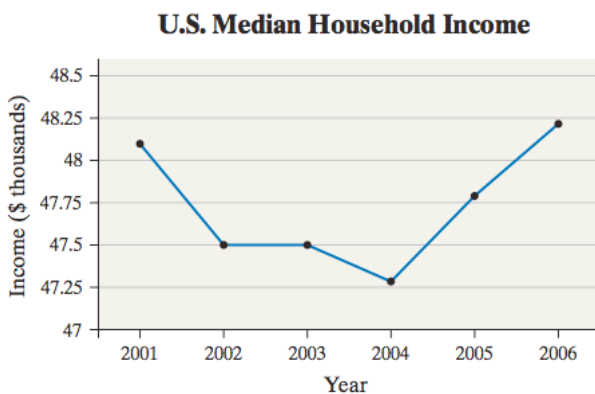
(a) Describe how the graph is misleading.
(b) What is the graph trying to convey?
(c) Redraw the graph so that Median Household Income
appears to be relatively stable for the years shown.

12. Electricity The following table gives the average per kilowatt-
hour prices of electricity in the United States for the years
2001 to 2007.
Source: U.S. Energy Information Administration

Year	2001	2002	2003	2004	2005	2006	2007
Price per kWh (cents)	8.58	8.44	8.72	8.95	9.45	10.40	10.65

(a) Construct a misleading graph indicating that the price
per kilowatt-hour has more than tripled since 2001.
(b) Construct a graph that is not misleading.