MAT 1272 Exam I (Takehome) Spring 1272: Descriptive statistics

You **MUST** use complete sentences for all parts in **bold**. This is an individual exam. You **MUST** not get anyone to show you how to do a problem. However, if you get stuck, a tutor from the learning center or the instructor may give you a hint to help you get unstuck. If you do get help from the learning center, you **MUST** show your tutor this statement. Each question is worth 5 points unless indicated otherwise.

1. Explain the two meanings of the word "statistics."

2. Briefly describe the areas of statistics.

3. Circle any of the following which constitutes a population (as opposed to a sample).
   a. Incomes of 500 families selected from New York
   b. Salaries of all employees of a company
   c. Number of absences during the semester for each of the students in a class
   d. Number of cars owned by each of the 100 families selected from a city
   e. Color of hair of 25 girls

4. List 3 reasons why a sample survey is often preferable to conducting a census.

5. The following table gives the names and ages of five persons.

Name	Age
Bill	39
Dawn	27
Sharmon	23
Joe	31
Connie	21

Circle and label a member, variable, measurement, and data set in this table. Use different colored pens or pencils

6. Circle any variable which is quantitative and classify it as discrete or continuous.
   a. Weight of a package
   b. Color of eyes of people
   c. Price of a concert ticket
   d. Number of televisions owned by families
   e. Number of births on a day in a hospital
   f. Model of a car
   g. Food expenditure per month for families
   h. Number of children per family
   i. Commuting time from home to work for a person
   j. Number of houses on a block

7. (10 pts) The ages of five employees of a company are 47, 28, 55, 41, and 52 years. Find:

a. Σx
b. $\Sigma(x - 6)$
c. $(\Sigma x)^2$
d. Σx^2
e. mean
f. median
g. sample standard deviation (Use formula from your formula sheet.)

8. A researcher asks 24 primary caregivers, who work outside their homes, whether or not they would work outside their homes if without working they had enough money to live comfortably. The following are the responses of these 24 caregivers. (N stands for no, Y represents yes, and D means does not know.)

N	D	Y	D	N	Y	N	N	D	N	N	Y
N	N	D	Y	Y	Y	N	N	N	D	Y	D

a. Construct a frequency distribution table.
b. Calculate the relative frequencies and percentages for all categories.
c. Draw a bar graph for the frequency distribution.
d. Draw a pie chart for the percentage distribution.

9. The following table gives the frequency distribution of the weights (in pounds) of 100 persons.

Weight (in pounds)	***f***		
90 to less than 110	8		
110 to less than 130	17		
130 to less than 150	21		
150 to less than 170	24		
170 to less than 190	19		
190 to less than 210	11		

a. List the class midpoints.
b. Do all classes have the same width? If yes, what is that width?
c. Prepare the relative frequency and percentage distribution columns.

10. (10 pts) The following data give the annual earnings (in thousands of dollars) of 20 low to moderate income families.

32.5	29.7	49.0	17.4	31.7	67.9	27.4
43.7	53.4	59.5	37.0	22.7	15.8	43.2
19.5	24.0	44.5	62.7	47.5	54.7	

a. Construct a frequency distribution table. Take the classes as 10 to less than 20, 20 to less than 30, ... , and 60 to less than 70.
b. Calculate the relative frequencies and percentages for all classes.
c. What percentage of the families have an annual income of $50,000 or higher?
d. What percentage of the families have an annual income of $40,000 to less than $60,000?
e. Draw a histogram and a polygon for the relative frequency distribution.

11. (10 pts) The following data give the number of cell phones owned over the past 3 years by a sample of 30 first year students in college.

2	4	3	1	1	5	4	2	2	3
1	1	2	2	4	3	3	1	5	2
3	3	2	1	3	1	4	2	3	1

a. Construct a frequency distribution table using single-valued classes.
b. Calculate the relative frequencies and percentages for all classes.
c. What percentage of the students own two or three telephones?
d. What percentage of the students own three or more telephones?
e. Draw a bar graph for the frequency distribution.
f. Is the data set symmetric, skewed to the right or skewed to the left?

12. (10 pts) The following table gives the frequency distribution of the number of hours each of the 200 students selected from a college studies per week.

Hours Studied	***f***
0 to less than 4	12
4 to less than 8	29
8 to less than 12	48
12 to less than 16	62
16 to less than 20	34
20 to less than 24	15

a. Construct a cumulative frequency distribution table.
b. Calculate the cumulative relative frequencies and cumulative percentages for all classes.
c. What percentage of the students study for less than 16 hours a week?
d. Draw an ogive for the cumulative percentage.
e. Use the ogive to estimate the percentage of students who study less 14 hours.

13. The following data give the commuting time (in minutes) from home to school for 30 high school students.

22	16	11	12	23	51	42	6	31	10
19	8	21	28	15	43	5	19	7	14
36	27	8	23	37	18	13	29	17	9

a. Prepare a stem-and-leaf display. Arrange the leaves for each stem in increasing order.

b. Is the data set symmetric, skewed to the right or skewed to the left?

14. Consider the following stem-and-leaf display.

1	29 45
2	34 65 74 98
3	25 46 59 73 82
4	01 36 68 88

a. Write the data set that corresponds to this stem-and-leaf display.

b. Think of a situation that could produce such a sample and write it down.

15. (10 pts) The following data give the speeds (in miles per hour) of 12 cars traveling on a highway.

67 71 57 54 69 74 77 62 61 59 58 63

a. Calculate the values of three quartiles.
b. Find the (approximate) value of the 40th percentile.
c. Find the percentile rank of 62.
d. Construct a box-and-whisker plot.
e. Is the data set symmetric, skewed to the right or skewed to the left?