Math 101-02
Fall 2015
Dr. Lily Yen

Midterm 1

Show all your work

Name: _____

Score: ___/54

A TI-83/84 calculator allowed.

Problem 1: Identify the variable in each of the following as DISCRETE or CONTINUOUS.

a. The monthly water usage at Capilano University

b. The cost of lecture notes in the Bookstore.

c. The difference in the number handshakes made by Prime Minister Harper compared to those made by Mr. Trudeau on the election campaign trail today.

Score: /3

Problem 2: Use your calculator to evaluate the following. Round your answers to 4 decimal places.

a. $\dfrac{32.17 - 11.78}{12.39/\sqrt{27}} \approx$

b. $3 - \left(\dfrac{7}{15}\right)^3 \cdot \left(\dfrac{2}{11}\right)^4 \approx$

Score: /3

Problem 3: Define a STATISTIC.

Score: /1

Problem 4: Identify the type of sampling method used: random, simple random, systematic, stratified, cluster, or convenience.

a. Every 20th registered biker in Tour de France race is subjected to a drug test.

b. All students of our class in Capilano University are chosen to receive a sample cereal pack each.

c. Lily asks the first five students who arrive for today's test the number of hours they studied for this test.

d. A computer randomly generates 20 student numbers from registered students this semester for a survey.

e. Divide registered students at Cap by their programs. Ask 10 students in each program to organize fund raising for United Way Campaign.

Score: /5

Problem 5: For a given data set, all you know is that the minimum is 10, and the maximum is 46.

a. Which of the measures of centre could be determined exactly? Circle one(s) that apply.

MEAN, MEDIAN, MODE, MIDRANGE.

b. Which of the measures of spread (or dispersion) could NOT be approximated:

MEAN DEVIATION, STANDARD DEVIATION, VARIANCE

Score: /2

Problem 6: Given the table of the number of credit cards owned per person in a random sample of 50 shoppers, answer the following.

No. of credit cards owned	No. of shoppers
0	5
1	13
2	12
3	15
4	5
total	50

a. Find the average number of credit cards owned per person.

b. Find the median of the number of credit cards owned per person.

c. Find the mode of the number of credit cards owned per person.

d. Find the 10th percentile of the number of credit cards owned per person.

e. Find the standard deviation of the number of credit cards owned per person. Give 2-decimal place accuracy.

Score: /5

Problem 7: Philip Seymour Hoffman was 38 years old when he won a Best Actor Oscar for his role in *Capote*. The Oscar-winning Best Actors have a mean age of 43.8 years and a standard deviation of 8.9 years.

a. Convert Hoffman's age to a z score.

b. If we consider "usual" ages to be those that convert to z scores between -2 and 2, is Hoffman's age usual or unusual?

Score: /3

Problem 8: A study investigating the characteristics of cars used by commuters to Capilano University produced the following frequency tables:

Country	Freq
America	387
Japan	246
Germany	57
Other	110
total	800

Table 1: Origin

Size	Freq
Sub-compact	213
Compact	376
Mid-size	197
Full-size	14
total	800

Table 2: Size

Year	Freq
2015	68
2014	59
2013	101
2012	159
2011	207
2010	99
2009–	107
total	800

Table 3: Year

No. Seats	Freq
2	37
3	0
4	282
5	297
6	123
7	52
8	9
total	800

Table 4: Capacity

L/100km	Freq
5.0–6.4	100
6.5–7.9	170
8.0–9.4	280
9.5–10.9	150
11.0–12.4	60
12.5–13.9	20
14+	20
total	800

Table 5: Efficiency

a. Regarding Frequency Table 2 on Car Size:

- Identify the variable: ; • its data type: ,

and • its level of measurement:

b. Identify the level of measurement for the values of the variable in the following Frequency Tables: • Table 1 ; • Table 3 ,

and • Table 4

c. Select a table for which a Pareto graph would be appropriate. Explain.

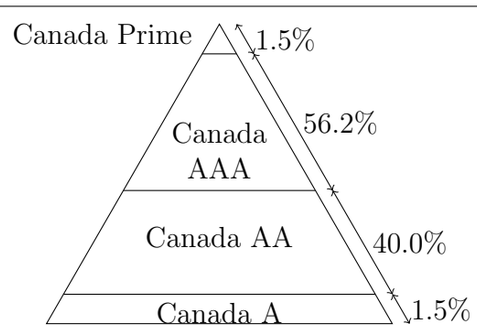
d. For Frequency Table 5,

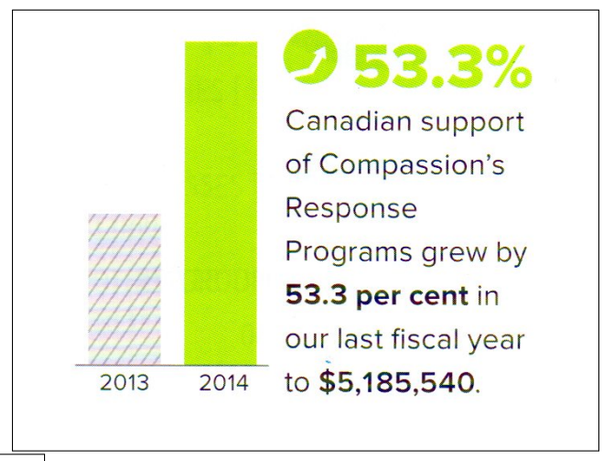
- what are the lower and upper boundaries of the first class?
- Find the class mark of the "12.5–13.9" class.
- Find the relative frequency of the first class.
- Identify the most appropriate type of graph for the data.
- Identify the class width used for all except the last class.

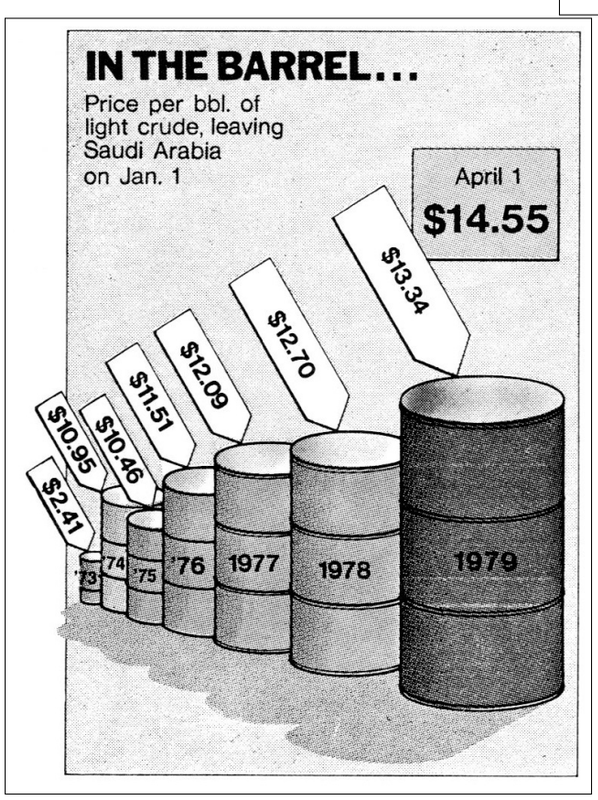
Score: /12

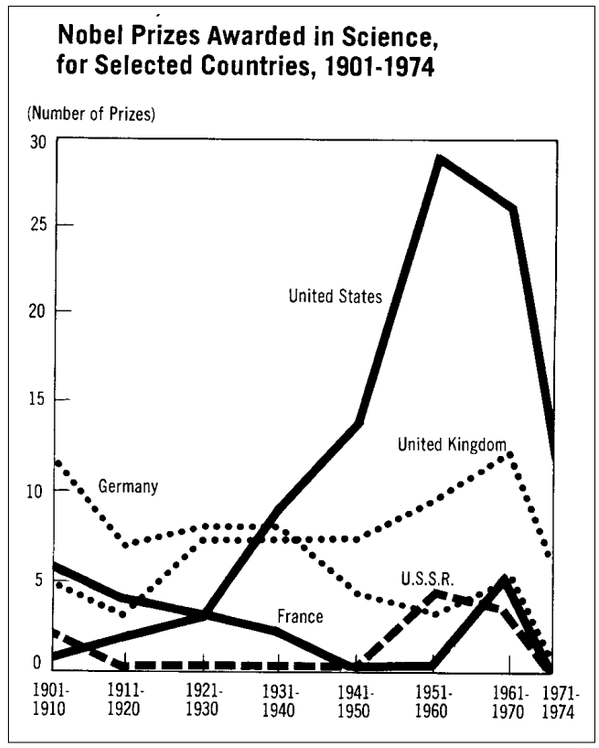
Problem 9: Comment on each of the following graphs regarding communication of information. If miscommunication happened, recommend alternatives to fix it. Nor more than two sentences per questions; two marks per diagram.

Grading is a quality designation based on several characteristics, including marbling. Marbling refers to the fine white flecks of fat that you see running through lean beef and that's a good thing. Marbling contributes to flavour and juiciness.









Score: /8

Problem 10: In a sample of 5 measurements, 4 deviations from the mean are known: $x - \overline{x}$ for the first four deviations is -2, 5, -7, and -4. Find the last deviation. Also find the variance of this sample.

Score: /3

Problem 11: On a calculus midterm, a student received a mark of 68.3 % which translated to a z score of 1.75. If the standard deviation for the midterm was 9.5 %, find the mean, $\boxed{}$. Also find the highest score that would be considered to be in the *usual* range, $\boxed{}$.

Score: /3

Problem 12: The following data show weights (masses) of pets owned by members of our class.

$$1.3, 2.1, 3.2, 4.4, 5.8, 11.6, 10.0, 7.9, 1.6, 1.9, 11.1, 7.5, 1.8, 1.9, 6.2, 4.5, 1.8, 4.7, 6.7, 3.5$$

a. Construct a stem-and-leaf plot to organize the data.

b. Construct a box plot with a clearly labelled numberline below it. Explain how you obtain each of the five summary numbers. Use classroom method.

Score: /6