Math 123
Fall 2017
Dr. Lily Yen

Test 2

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ___/41

Problem 1: Answer each question to two decimal place accuracy when appropriate. Write out steps for each.

a. Convert the fraction $1\frac{3}{4}$ into a percent.

b. Find 4.5 % of 480.

c. What percent of 379 is 30?

d. 80 is 20 % of what number?

e. When you buy a 500-dollar futon, how much in total do you need to pay the store?

Hint: We have a 5 % GST and 7 % PST.

f. If there is a 1 in 2600 chance that you will pick the numbers correctly in tonight's lottery, what is the probability you will NOT pick the numbers correctly?

g. In a given year, 1 877 000 males and 1 737 000 females were born in a certain country.

Find the odds against having a female baby that year?

h. The residents of a small town and the surrounding area are divided over the proposed construction of a dog park in town, as shown in the table. A reporter randomly selects a person to interview from a group of residents. If the person selected lives in town, what is the probability that the person supports the dog park?

	Support dog park	Oppose dog park
Live in town	7252	6316
Live in surrounding area	518	461

i. When you flip two coins, what is the probability of getting at least one head?

j. When you draw a single card from a deck of 52 cards, what is the probability of getting a red queen?

k. Assume that A and B are events. If $P(A \cup B) = 0.70$, $P(A) = 0.30$, and $P(B) = 0.55$, find $P(A \cap B)$.

Score: /11

Problem 2: We are flipping three coins. Outcomes in the sample space are represented by strings of Hs and Ts such as TTH and HHT for tail, tail, head and head, head, tail, respectively.

a. How many elements are in the sample space?

b. Express the event: *there are more tails than heads* as a set.

c. Find the probability that there are more tails than heads.

d. Find the probability that there are an equal number of tails and heads.

Score: /5

Problem 3: Solve for the indicated variable.

a. Solve for r in $A = P(1 + rt)$

b. Solve for x in $(1.025)^x = 10$

c. Solve for n in $A = P(1 + r/m)^n$

Score: /7

Problem 4: The table shows the age distribution of those who earned less than minimum wage in a recent year. If a worker is randomly selected from those surveyed, find the probability that the person is older than 44.

Age	Working below minimum wage
16–19	337 000
20–24	417 000
25–34	331 000
35–44	168 000
45–54	113 000
55–64	80 000
65 and older	37 000

Score: /3

Problem 5: The table relates the amount of time consumers engage in online shopping per month with their annual income. Find the probability that a randomly selected consumer spends 0–2 hours per month shopping online AND has an annual income below $40 000.

Annual income	10 h or more	3 h–9 h	0 h–2 h	Total
Above $60 000	188	179	129	496
$40 000–$60 000	147	216	160	523
Below $40 000	129	188	253	570
Total	464	583	542	1589

Score: /2

Problem 6: A candy jar contains 50 green jelly beans, 35 pink jelly beans, and 15 white jelly beans. Two jelly beans are randomly selected without replacement. Let G be the event *you select a green jelly bean first*, and let N be the event *the second jelly bean is not green.* Find $P(N \mid G)$.

Score: /3

Problem 7: According to US government statistics, mononucleosis (mono) is four times more common among college students than the rest of the population. Blood tests for the disease are not 100 % accurate. Assume that the table was obtained regarding students who came to Capilano's health centre complaining of tiredness, a sore throat, and slight fever.

	Has Mono	No Mono	Total
Positive test	72	4	76
Negative test	8	56	64
Total	80	60	140

Find the probability the student does not have mono, given that the test is positive.

Score: /2

Problem 8: Suppose you purchase a used car for \$6000 and have agreed to pay off the car in 24 monthly payments of \$325 each.

a. Find the total amount of interest charged in this car loan.

b. Assume the payments are computed using the add-on interest method, find the annual interest rate applied.

Score: /3

Problem 9: Ann and Tom want to establish a fund for their grandchild's university education. What lump sum must they deposit at a 6 % annual interest rate, compounded monthly, in order to have \$20 000 in the fund at the end of 15 years?

Score: /3

Problem 10: Lily received an overdue notice dated October 18th from Diamond Parking Ltd. claiming that she did not pay her parking ticket of \$70 on September 14th. The service charges a 2 % monthly interest rate compounded daily. (Use 30 days per month for rate calculation.) Suppose the parking ticket was due immediately on the day it was issued, how much should the overdue notice charge Lily for October 18th?

Score: /2