

Math 123-02
Spring 2026
Dr. Lily Yen

Midterm Two

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ____/30

Problem 1: Answer each question to two decimal places when appropriate. Steps may help you receive part marks.

a. Find 60% of 8000.

b. Convert the fraction $5\frac{2}{3}$ into a percent.

c. When Brian buys a 300-dollar (ticket price) tent, how much does the store charge Brian in taxes? Hint: Stores need to charge a 5% GST and a 7% PST.

d. David treated his mother and grandmother to a Mother's Day Brunch at Queen Elizabeth's Theatre's Browns Social House. He saved \$180 for this occasion to cover a 15% tip and a 12% service tax. What was the maximum they could order to stay within his budget of \$180?

e. 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.

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

Score: /5

Problem 2: Solve for the indicated variable.

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

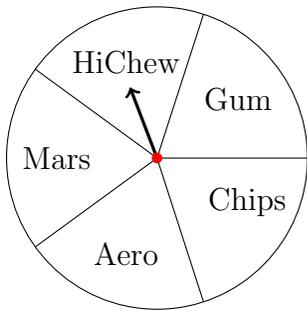
b. Solve for x in $(3.5)^x = 42$.

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

Score: /5

/10

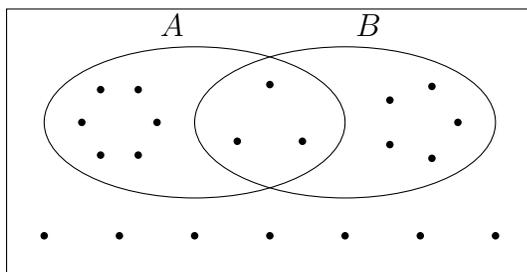
Problem 3: You are participating in an experiment to spin a spinner with five equal sectors and to roll a cubic die (D6) at the same time. Assume that the pointer never lies on a border line and the die is fair, answer the following questions.



- Next to the spinner above, construct a table for the sample space of the experiment.
- Let X_1 be the random variable for spinning the spinner once. Let X_2 be the random variable for rolling the cubic die once. Find $P((X_1 = \text{Gum}) \cap (X_2 < 2))$.

Score: /3

Problem 4: Dad drew a big rectangle representing a sample space containing two events, A and B . Assume that the outcomes (as dots) were all equally likely, answer the following questions.



a. $P(A \cap B)$

b. $P(\bar{A})$

c. $P(B \cup \bar{A})$

d. $P(B | A)$

e. Are A and B mutually exclusive?

f. Are A and B independent?

Score: /7

Problem 5: Hamlet woke up with a high fever and a bad cough. When Sam brought him to the doctor, a rapid antigen test from a throat swab sample was performed. From the table below, draw a probability tree with probabilities assigned on the branches. Also find the probability of HAVING no strep throat given a positive test result.

		Streptococcus	
		Have Strep A	No Strep A
Test	+	240	35
Results	–	60	4565

Score: /4

Problem 6: Suppose Brian's brother purchased a used car for \$10 000 and agreed to pay off the car in 6 monthly instalments of \$2000 each.

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

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

Score: /3

Problem 7: David's grandparents want to establish a fund for their grandchildren's university education. What lump sum must they deposit at a 2.75% annual interest rate, compounded semi-annually, in order to have \$30 000 in the fund at the end of 18 years?

Score: /3