

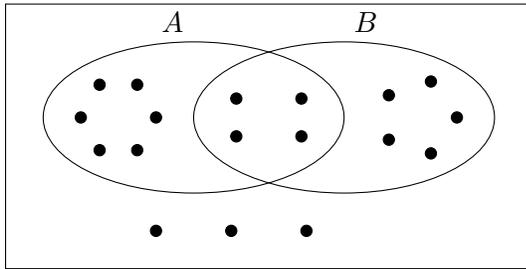
Test 2

Show all your work

Name: _____
 Number: _____
 Signature: _____
 Score: ____/44

A TI-83/84 calculator allowed. You must use proper notation.

Problem 1: Each dot in the Venn diagram represents an equally likely event in the sample space S . Suppose one of them is randomly selected. Find each probability below.



a. $P(\bar{B}) =$

b. $P(A \text{ and } B) =$

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

d. $P(A | B) =$

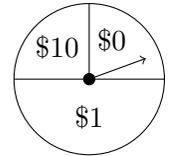
e. $P(A \text{ and } \bar{B}) =$

f. Are A and B independent? Explain.

Score: /6

Problem 2: The spinner shown is used to answer the following questions.

a. Draw a probability tree for two spins on the spinner. Clearly label the probability of each branch.



b. Find the probability for getting at least \$10 after 2 spins.

c. Find the probability that you win less than \$3 after 3 spins.

Score: /7

Problem 3: The table is taken from “Helmet Use and Risk of Head Injuries in Alpine Skiers and Snowboarders” by Sullheim, et al., Journal of the American Medical Association, Vol. 295, No. 8.

	Head injuries	Not injured	Total
Wore helmet	96	656	
No helmet	480	2330	
Total			

- If one of the subjects is randomly selected, find the probability of selecting someone with a head injury.
- Given that a subject wore a helmet, what is the probability that the subject received a head injury?
- If one of the subjects is randomly chosen, find the probability of choosing someone who did not wear a helmet, given that the subject had head injuries.

Score: /4

Problem 4: West Coast Seeds company has crossed two types of beans. It is known that each bean plant grown after this cross has a 65% probability of having marbled pods while the rest have green pods.

- Suppose 20 plants are grown from this cross. Find the probability that exactly half of them have marbled pods.
- Suppose 30 plants are grown from this cross. Find the probability that at least 10 of them have green pods.
- Suppose Farmer McDonald planted 2000 plants from this cross. Determine the mean and standard deviation of the random variable that counts the number of plants with marbled pods.
- If 2000 plants are grown from this cross, would it be unusual for 1200 of the plants to have green pods? Justify your answer.

Score: /8

Problem 5: In New Jersey's Pick 4 lottery game, you pay 50 cents to select a sequence of four digits from 0 to 9, like 1330. If you select the same sequence of four digits that is drawn, you win and collect \$2788.

- | | |
|---|------------------------------------|
| <p>a. How many different selections are possible?</p> <p>b. Find the probability of winning.</p> <p>c. If you win, what is your net profit?</p> | <p>d. Find the expected value.</p> |
|---|------------------------------------|

Score: /5

Problem 6: Suppose the table below gives the probability distribution for a random variable X . Find the missing entry under $x = 4$.

x	0	1	2	3	4
$P(x)$	0.02	0.15	0.49	0.23	<div style="border: 1px solid black; width: 40px; height: 30px; display: inline-block;"></div>

Then suppose the random variable X represents the number of cell phones a Capilano University student owns, and P is the probability distribution function for X .

- a. Find the probability that a randomly selected Cap student owns at least two cell phones.
- b. Find the mean and standard deviation of the number of cell phones a Cap student owns.

Score: /7

Problem 7: Suppose you observed a distracted-intoxicated driving checkpoint conducted by the RCMP in Burnaby and saw that 676 drivers were screened, and 57 were arrested for distracted driving (D), 11 were arrested for driving while intoxicated (I), and 5 were arrested for both.

Answer the following using a Venn diagram or probability formulas. Give your answers as %.

a. Find the % that did both.

b. For this example, what is $P(D \text{ or } I)$? Explain in plain English what this percentage of drivers did.

c. Given that a particular driver screened was distracted while driving, what is the probability that the driver was also intoxicated?

d. Determine $P(I \text{ and } \bar{D})$.

Score: /7