

Assignment 5

Show all your work

Name: _____
 Number: _____
 Signature: _____
 Score: ____/20

Problem 1: Answer each question to two decimal place accuracy when appropriate. If an exact answer is possible expressed as a fraction, you may leave your answer as a fraction.

- a. If James draws a single card from a deck of 52 cards, what is $P(X \geq 10)$?

$$\frac{4}{13}$$

- b. Suppose a blue cubic die and a green cubic die are rolled, find $P(X_b + X_g \leq 4)$.

$$\frac{1}{6}$$

- c. When you flip a fair coin three times, what is the probability of getting only heads?

$$\frac{1}{8}$$

- d. If the chance of winning a Student Union Lottery Jackpot is 0.01%, find the chance of not winning the jackpot.

$$99.99\%$$

- e. A survey is conducted among students and faculty at Capilano University regarding the use of artificial intelligence for students. If a student is randomly selected, what is the probability that the student is for the use of artificial intelligence for students?

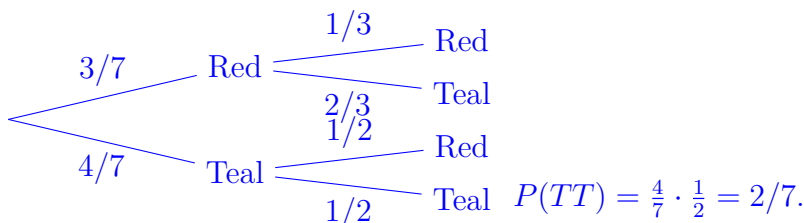
$$437/548$$

Capilano University Survey			
	For A1	Against A1	Total
Students	437	111	548
Faculty	52	107	159
Total	489	218	707

Score: /5

Problem 2: A pot contains 3 red balls and 4 teal balls. Hamlet draws two balls out of the pot without replacement. Draw a probability tree for drawing two balls without replacement. (2 points)

- a. Find the probability of getting 2 teal balls.



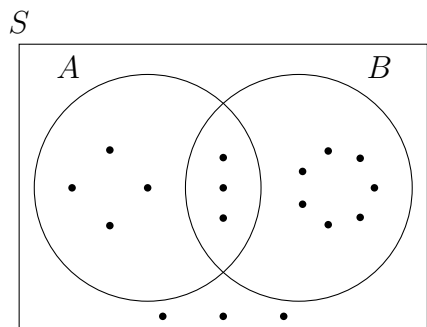
- b. Find the probability of getting no teal balls.

$$P(RR) = \frac{3}{7} \cdot \frac{1}{3} = \frac{1}{7}$$

Score: /5

$$/10$$

Problem 3: Dad drew a big rectangle representing a sample space containing Event A and Event B. Assume that the outcomes (as dots) were all equally likely, give a fraction for each probability question.



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

7/17

b. $P(A \cap B)$

3/17

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

13/17

d. $P(B | A)$

3/7

e. Are A and B disjoint?

No

Score: /5

Problem 4: Assume that 10% of international visitors arriving at the Vancouver International Airport are sick with ARI (Acute respiratory infections). Suppose a test correctly identifies a visitor sick with ARI 96% of the time. Also assume that the test falsely identifies a healthy visitor as sick with ARI 9% of the time. If an international visitor tests positive, what is the probability that the visitor is not sick with ARI?

Draw a probability tree as part of your steps.

$$P(\overline{\text{ARI}} | +) = \frac{P(\overline{\text{ARI}} \cap +)}{P(+)} = \frac{0.90 \times 0.09}{0.90 \times 0.09 + 0.10 \times 0.96} = 0.4576 = 45.76\%$$

Score: /5