Bayview Secondary School
Mathematics Department: Course Code: MDM4U1-01
Unit 4 - Assessment FOR Probability Theory PART 1

Name: _____

K-16	T-3

Instructions:

1) Scientific calculators are allowed but cannot be shared.
2) Duration of the assessment: 40 minutes
3) Show all work to obtain full marks for questions.
4) The use of cellphones, audio- or video-recording devices, digital music players or email or text-messaging devices during the assessment is prohibited.
5) **Final answers must be in either improper faction to the lowest term or round to 3 decimal places.**

Knowledge and Understanding

1. Identify the sample space for each event. [1 mark each]

a) Drawing a card from a standard deck of cards.	
b) Rolling a ten-sided die.	

2. Determine whether each probability is subjective, experimental, or theoretical. [1 mark each]

a) The probability of rolling an even number with a standard die is 50%.	
b) The probability that your teacher will give a surprise quiz today is 75%.	
c) The probability that a baseball player will get a hit the next time at bat is 0.325 based on his past season's record.	

3. Determine the probability of each outcome. [1 mark each]

a) $P(red\ card)$ from a standard deck of cards	
b) $P(green\ marble)$ from a bag of marbles consisting of four green, ten red and six yellow	
c) $P(number\ divisible\ by\ 3)$ with a standard die	

4. Suppose your school has the following numbers of students:

Grade	Male	Female	Totals
9	113	128	241
10	109	92	201
11	85	121	206
12	115	98	213
Totals	422	439	861

Determine the probability of each of the following event using the table above. [1 mark each]

a) For a prize draw, the name of every student is placed in a hat. What is the probability that the name of a male student in grade 11 will be chosen?	
b) The grade 12 students are choosing a representative to sit on the Parent Council. What is the probability that the representative will be female?	
5. A section of a test consists of four true-or-false questions. What is the probability that all the answers are the same? [1 mark]	
6. If you choose one card from a standard deck, what are the odds in favour of getting a spade? [1 mark]	
7. What is the probability that four cards in your hand from a standard deck of cards will be all spades? [2 marks]	
8. There are 20 people in your Data Management class, each of whom has to make a presentation. What is the probability that you will go first? [2 marks]	

Thinking

Name: _____

1. A basketball player has a basket-to-shot ratio of 40%, but after scoring two baskets in a row, her shooting percentage increases to 70%. This represents what many players perceived as a “hot hand” effect. A phenomenon such that when you have scored two or more shots in a row, you are more likely to continue to sink baskets.

   Create a tree diagram to represent the probability of all the possible outcomes of four shots. [3 marks]

--- End of Part 1 Assessment ---

Bayview Secondary School
Mathematics Department: Course Code: MDM4U1-01
Unit 4 - Assessment FOR Probability Theory PART 2

Name: _____

A-18	T-3

Instructions:

1) Scientific calculators are allowed but cannot be shared.
2) Duration of the assessment: 40 minutes
3) Show all work to obtain full marks for questions.
4) The use of cellphones, audio- or video-recording devices, digital music players or email or text-messaging devices during the assessment is prohibited.
5) **Final answers must be in either improper faction to the lowest term or round to 3 decimal places.**

Application

1. A survey of television viewers at A Child's Place Preschool produces the following data:
   60% watch Sesame Street
   50% watch DC Super Heroes
   50% watch Paw Patrol
   30% watch Sesame Street and DC Super Heroes
   20% DC Super Heroes and Paw Patrol
   30% Sesame Street and Paw Patrol
   10% watch all three

   a) Draw a Venn diagram to support your solution in order to obtain full marks. [2 marks]

   b) What is the percentage view exactly two of these programs? [2 mark]

2. Your friend has a five-letter password for her e-mail account. If you need to guess her password, mathematically prove which of the following methods will have a higher probability to guess correctly? [2 marks]

   Method 1: There are approximately 1500 five-letter words in the English language. Your friend is definitely using a word for her password.

   Method 2: You don't care if that is a word or not. It is just a five-letter password and letters cannot be repeated.

3. A sample of 23 students, what is the probability that 2 or more students will have the same birthday date? [2 marks]

4. A section of a test consists of four true-or-false questions. What is the probability that there are at least two answers that are true? [2 marks]

5. The odds in favour of Liverpool winning the World Cup are 10 to 7. What would be the winnings if a $2.00 bet is placed and Liverpool win? [2 marks]

6. A newspaper surveyed 150 people about a change in its format. Of the people surveyed, 87 people like the change, 81 men participated in the survey, and 24 of those men like the change. One of the people who took the survey will win a year's subscription to the paper. What is the probability that the winner will be:

   a) Someone who likes the change in format? [2 marks]

   b) A man who does not like the change? [2 marks]

   c) A woman who likes the change? [2 marks]

Thinking

2. A television game show allows contestants to choose one of three doors and keep whatever prize is behind the door. Usually, a valuable prize is behind only one of the doors, with token prizes behind the other two. When a contestant makes a selection and before that door is opened, the host shows that a token prize is behind one of the other two doors and offers the contestant the opportunity to switch to the remaining door.
   a) Create a tree diagram to represent all of the possible different outcomes of the two choices (the original choice and the decision to switch or not) [2 marks]

   b) Determine whether switching or staying is the better strategy. [1 mark]

--- End of Part 2 Assessment ---