TB(3B) Ch. 11 Introduction to Probability

Conventional Questions

1. [13-14 S.3 Final Exam #6]

There are 6 cards in a bag marked with numbers 1, 2, 3, 3, 4 and 5 respectively.

(a) If a card is drawn at random from the bag, find the probability that the number on the card is an odd number. **(1 mark)**

(b) If 2 cards are drawn together at random, find the probability that the sum of the numbers on the cards is a multiple of 4. **(1 mark)**

(c) Now, 10 more cards are put into the bag. If a card is drawn at random and the probability of getting an even number is $\frac{3}{8}$, find the number of even number cards added to the bag. **(2 marks)**

2. [14-15 S.6 Mock Exam #9]

Figure 2 shows a lucky draw spinner consisting of 5 parts which are marked with amounts \$1, \$3, \$5, \$10 and \$20. The prize of the lucky draw is the amount of the part on which the pointer rests. Assume that the pointer will not rest on the boundaries of any two adjacent parts.

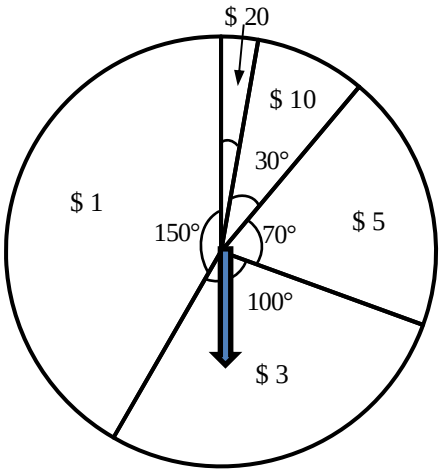

Figure 2

(a) Find the probability of getting \$20 in one spin.

(b) If a player has to pay \$4 for one spin, is it worth playing the game? Explain your answer. **(3 marks)**

3. [14-15 S.3 Final Exam #8]

There are two boxes A and B. Box A contains one green ball and two red balls, box B contains one green ball, one blue ball and one red ball. John draws one ball from each box.

(a) Let *G*, *B* and *R* be the labels of the green ball, blue ball and red ball respectively. Complete a tree diagram in the space below to list all the possible outcomes using the labels.

(1 mark)

Box A **Box B** **Possible Outcomes**

(b) Find the probability that two balls are of the same color. **(1 mark)**

(c) If John gets two balls of the same color, he can draw for either \$50 or \$100 cash prize with equal chance. If he gets two balls of different colors, he can draw for either \$10 or \$5 cash prize with equal chance. Write down the probability that John will receive a \$100 cash prize.

(2 marks)

4. [15-16 S.3 Final Exam #5]

A pair of red socks, a pair of yellow socks and a pair of green socks are put in a drawer. Peter draws two socks one by one from the drawer at random.

(a) Let R, Y and G represent a red sock, yellow sock and green sock respectively. List all the possible outcomes in the table. For example, if the first sock is green and the second sock is yellow, write GY. **(1 mark)**

		Second sock					
		R	R	Y	Y	G	G
First sock	R						
	R						
	Y						
	Y						
	G						
	G						

(b) Find the probabilities of getting

(i) one red sock and one green sock.

(ii) two socks with same colour.

(i) at least one yellow sock. (3 marks)

5. [16-17 S.3 Final Exam #7]

A fair coin is tossed once and a fair dice is thrown once.

(a) Let H stand for a head and T stand for a tail. List all the possible outcomes in the table. For example, if the result is head and 1, write H1. **(1 mark)**

		dice					
		1	2	3	4	5	6
coin	H	H1					
	T						

(b) Write down the probability that the result is a head and an even number. **(1 mark)**

6. [16-17 S.3 Final Exam #11]

There are 4 houses in a school: G, H, R and S house. Students would be assigned to one of them with equal chance when they were admitted to the school.

(a) A student is randomly selected. Find the probability that the student is in H house.**(1 mark)**

(b) 50 students are randomly selected to form a group and the information is shown below.

House	G House	H House	R House	S House
Number of students	10	14	11	15

(i) Write down the experimental probability that the student is in H House. **(1 mark)**

(ii) In a school event, this group of 50 students are getting different numbers of gifts according to their houses: students from G, H, R and S house are getting 10, 5, 2 and 1 gifts respectively. If one student is selected from these 50 students randomly, find the expected value of the number of gifts with the use of experimental probability. **(2 marks)**

7. [17-18 S.3 Final Exam #7]

Figure 3 shows a triangular dartboard *ADE*. A dart is thrown to hit the dartboard. Suppose $AB : BD = 3 : 2$.

(a) Find the probability that the dart hits ΔABC. **(2 marks)**

(b) 10 marks will be awarded for hitting ΔABC and 6 marks will be awarded for hitting quadrilateral $BCED$. Jason throws a dart at random and the dart hits the dartboard. Find the expected value of the marks Jason will get in one throw. **(2 marks)**

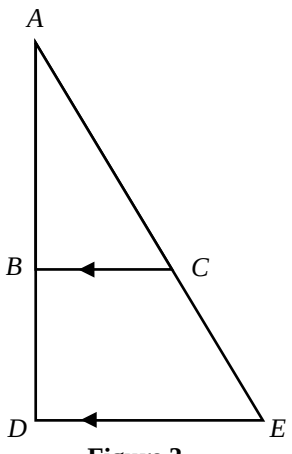

Figure 3

8. [17-18 S.3 Final Exam #8]

A bag contains chocolate beans in three colours. There are 1 red bean, 2 green beans and 3 yellow beans. Sara draws one bean at random each time.

(a) Using 'R', 'G_1', 'G_2', 'Y_1', 'Y_2' and 'Y_3' to represent 1 red, 2 green and 3 yellow beans respectively, list all the possible outcomes in the first two draws without replacement by using the given table. **(2 marks)**

		2nd draw					
		R	G_1	G_2	Y_1	Y_2	Y_3
1st draw	R						
	G_1						
	G_2						
	Y_1						
	Y_2						
	Y_3						

(b) Find the probability of getting beans of the same colour in the first 2 draws without replacement. **(1 mark)**

(c) Find the probability of getting beans of the different colours in the first 3 draws without replacement. **(1 mark)**

~ End ~