DAY 6 – Theoretical Probability

1. The LA Lakers are favoured to win over the Toronto Raptors. Based on previous games, the Lakers have a $^{7}/_{9}$ chance of winning.
    a. How many games is each team expected to win if 18 games were played?

    b. What are the chances of each team winning a single game? Express your answers as percentages.

2. The probability of it raining today is 40%. What is the probability of it <u>not</u> raining today?

3. Two students invent a game. Two players race pieces around a game board. They roll a die to determine how many spaces to move. They use a spinner to determine whether the player moves her or his own piece, the opponent's piece, or both pieces.
    a. Make a tree diagram to show the possible outcomes when the die is rolled and the spinner spun.

    b. Suppose you are playing the game. You roll the die and spin the pointer. Determine the probability of each event.

    i. You move only your own piece 6 spaces.

    ii. You move either or both pieces 3 spaces.

    iii. You move only your opponent's piece any number of spaces.

4. The chances of you winning a prize in the Cash for Cancer Lottery is 1 in 7.
   a. Express your chances of winning a prize as a percent.

   b. The Lottery sells a limited number of tickets (120,000). What are your chances of winning the grand prize of $1,000,000 if you purchased
      i. only one ticket? ii. 4 tickets? iii. 10 tickets?

5. A group of people are standing around talking when the topic of birthdays comes up. They are quite surprised when it turns out that two share the same birth month.
   a. What is the probability of a random person sharing the same birth month as you?

   b. Based on theoretical probability, how many people in the class should share the same birth month as you?

6. For each game of chance described,

	i. state the probability of winning	ii. whether you think the game is worth while (give reasons)
a. Bet $1. Toss a coin. If it shows a head, you win $2.		
b. Bet $1. Draw a card from a well-shuffled deck. If it shows a spade, you win $5.		
c. Bet $1. Draw a card from a well-shuffled deck. If it shows an ace, you win $10.		
d. Bet $1. Toss two coins. If they show heads, you win $3.		