CMPT 210: Probability & Computing
Practice Problems 2

(1) Among 100 lottery tickets there is 1 winning ticket. I buy 2 tickets (there is equal probability of buying any of the 100 tickets). Find the probability I win.

(2) You shuffle a deck of cards and deal your friend 5 cards.

- What is the probability that they have exactly one ace in their 5 cards?
- What is the probability that they have the ace of spades in their 5 cards?

(3) Suppose we made a loaded dice of 6 sides such that $\Pr[1] = \frac{1}{16}$, $\Pr[2] = \Pr[3] = \Pr[4] = \Pr[5] = \frac{1}{8}$. Calculate the probability of getting either a 1 or 3 or 6.

(4) An urn contains 10 white, 5 yellow, and 10 blue marbles. A marble is chosen at random. (i) What is the probability it is yellow? (ii) We are told that the chosen marble is not blue. What is the probability it is yellow?

(5) Two integers are simultaneously chosen at random from $\{1, 2, 3, \ldots, 100\}$. What is the probability that we chose $\{3, 5\}$?

(6) Two integers are chosen at random from $\{1, 2, 3, \ldots, 100\}$, one after the other without putting the first back. What is the probability that we chose $\{3, 5\}$?

(7) Two teams A and B are asked to separately design a new product within a month. From past experience we know that, (a) The probability that team A is successful is $2/3$, (b) The probability that team B is successful is $1/2$, (c) The probability that at least one team is successful is $3/4$. Assuming that exactly one successful design is produced, what is the probability that it was designed by team B.

(8) Two players take turns flipping a fair coin. Whoever flips heads first is declared the winner. What is the probability that the first player wins?