

International Institute for
Technology and Management



Tutoring Sheet # 1a

Unit 04b : Statistics 2

1. In a group of 20 Adults , 4 out of the seven women and 2 out of 13 men wear glasses. What is the probability that a person chosen at random is a woman or wear glasses?
2. A fair die is thrown twice. Find the probability that:
 - a. Neither throw result in a 4.
 - b. At least one throw results in a 4.
3. The probability that a certain machine breaks down in the first month of operation is 0.1. If a firm has two machines installed at the same time, find the probability that at the end of the first month, just one machine has broken.
4. For any two general events A and B :
 - a. Show that : $P(B) = P(B \cap A) + P(B \cap A^c)$
 - b. Deduce that : $P(B) = P(B|A) \times P(A) + P(B|A^c) \times P(A^c)$
 - c. Use part (a) to show that , If A and B are independent events, then A^c and B are independent.
5. A card is picked from a pack of 20 cards numbered 1,2,.....,20 Given that it shows an even number, find the probability it is multiple of 4.
6. Two digits are drawn at random from a table of random numbers containing the digits 0 ,1,2,.....,9. Find the probability that:
 - a. The sum of the two numbers is greater than 9, given that the first number is 3.
 - b. The second number is 2, given that the sum of the two numbers is greater than 7.
 - c. The first number is 4, given that the difference of the two numbers is 4.

7. Two cards are drawn successively from an ordinary pack of 52 playing cards and kept out of the pack. Find the probability that:
- Both cards are Hearts.
 - The first card is a Heart and the second card is a spade.
 - The second card is a diamond, given that the first card is a club.
8. A bag contains 4 red counters and 6 black counters. A counter is picked at random from the bag and not replaced. A second counter is then picked. Find the probability that:
- The second counter is red ,given that the first counter is red.
 - Both counters are red.
 - The second counter is red.
 - The counters are of different colors.
9. Events A and B are such that $P(A) = 4/7$, $P(A \cap B) = 1/3$
 $P(A|B) = 5/14$. Find
- $P(A \cap B)$
 - $P(B)$
 - $P(B|A)$
10. Bag A contains 5 red and 4 white counters. Bag B contains 6 red and 3 white counters. A counter is picked at random from bag A and placed in Bag B. A counter is now picked from bag B , find the probability that this counter is white.
11. Of group of students, 56% are boys and the rest are girls. The probability that a boy is studying chemistry is $1/5$ and the probability that a girl is studying chemistry is $1/11$. Find the probability that a student selected at random from this group is:
- A girl studying chemistry.
 - A student not studying chemistry.
 - A chemistry student who is male.
12. Three people decide to enter a marathon race. The respective probabilities that they will complete the race are 0.9,0.7 and 0.6 Find the probability that at least two will complete the race. Assume that the performance of each is independent of the performances of the others.