

Problems, Session 2.

1. If two dice are rolled, what is the probability that the sum of the upturned faces will equal 7?
2. If 3 balls are “randomly drawn” from a bowl containing 6 white and 5 black balls, what is the probability that one of the balls is white and the other two black?
3. An urn contains n balls, one of which is special. If k of these balls are withdrawn one at a time, with each selection being equally likely to be any of the balls that remain at the time, what is the probability that the special ball is chosen?
4. In the game of bridge, the entire deck of 52 cards is dealt out to 4 players. What is the probability that: (a) one of the players receives all 13 spades; (b) each player receives 1 ace.
5. A total of 36 members of a club play tennis, 28 play squash, and 18 play badminton. Furthermore, 22 of the members play both tennis and squash, 12 play both tennis and badminton, 9 play both squash and badminton, and 4 play all three sports. How many members of this club play at least one of three sports?
6. Suppose that A and B are mutually exclusive events for which $P(A) = .3$ and $P(B) = .5$. What is the probability that: (a) either A or B occurs? ; (b) A occurs but B does not? ; (c) both A and B occur?
7. If it is assumed that all poker hands are equally likely (choosing 5 cards from 52 cards), what is the probability of being dealt (a) a flush? (A hand is said to be a flush if all 5 cards are of the same suit.) ; (b) one pair? (This occurs when the cards have denominations a, a, b, c, d , where a, b, c , and d are all distinct.)
8. An urn contains 3 red and 7 black balls. Players A and B withdraw balls from the urn consecutively until a red ball is selected. Find the probability that A selects the red ball. (A draws the first ball, then B , and so on. There is no replacement of the balls drawn.)
9. If a die is rolled 4 times, what is the probability that 6 comes up at least once?
10. If there are 12 strangers in a room, what is the probability that no two of them celebrate their birthday in the same month?