



Combinatorics



1. A box contains 4 red discs and three blue discs. Two discs are taken out, without replacement. What is the probability that one is red and the other is blue?
2. A bag contains seven red marbles and three blue marbles. Sam takes three marbles out.
What is the probability that:
 - i. All three are red.
 - ii. One is red and two are blue.
3. A bag contains six red sweets, three green sweets and five blue sweets. Aaron takes out three sweets.
Find the probability of getting:
 - i. Two green sweets and one red sweet.
 - ii. Three blue sweets.
 - iii. All three sweets being the same colour.
 - iv. All three sweets being different colours.
 - v. At least two sweets are the same colour.
4. For a lottery, 35 cards numbered 1 to 35 are placed in a drum. Five cards will be chosen at random from the drum as the winning combination.
 - i. How many different combinations are possible?
 - ii. How many of all the possible combinations will match exactly four numbers with the winning combination?
 - iii. How many of all the possible combinations will match exactly three numbers with the winning combination?
 - iv. Show that the probability of matching at least three numbers with the winning combination is approximately 0.014.
5. A team of four students is to be chosen at random to represent their school in a table quiz. The team is to be chosen from the ten students with top exam results, which include 6 girls and 4 boys. Find the probability that the team consists of:
 - i. Only girls.
 - ii. Only boys
 - iii. More girls than boys.





6. Ten balls, numbered 1 to 10 are placed in a drum. Two balls are taken out. Find the probability that :
- Both are prime numbers (1 is not a prime number.)
 - Both are even or both are odd.
 - One is prime but the other is not.
7. A deck contains ten cards, each marked with a different whole number from 11 to 20. Three of the cards are drawn at random from the deck. Find the probability that:
- A card with the number 15 is drawn?
 - The three cards are odd?
 - The product of the numbers on the three cards is odd?

