

**Aim:** How do we use permutation and combination to evaluate probability?

**Do Now:** Your investment counselor has placed before you a portfolio of 6 stocks and 4 bonds. Following her advice, you have decided to invest in 4 of the ten choices. In how many ways can you

- a. select any 4?
- b. select two stocks and two bonds?
- c. select 3 stocks and 1 bond?

1. Your investment counselor has placed before you a portfolio of 6 stocks and 4 bonds.

From 4 investments selected at random from 10 choices find the probability of

- a) selecting 2 stocks and 2 bonds.
- b) selecting 3 stocks and 1 bond.

$$P(E) = \frac{n(E)}{n(S)}$$

2. A homeowner plants 6 bulbs selected at random from a box containing 5 tulip bulbs and 4 lilac bulbs. What is the probability that he planted 4 tulip bulbs and 2 lilac bulbs?



$$P(E) = n(E)/n(S) = \frac{{}_5C_4 \cdot {}_4C_2}{{}_9C_6} = \frac{5 \cdot 6}{84} = \frac{30}{84} = \frac{5}{14}$$

3. An urn contains 4 white marbles and 5 blue marbles. If 3 marbles are drawn at random with no replacement, what is the probability that at least 2 marbles drawn are blue?

$$P(E) = \frac{n(A) + n(B)}{n(S)}$$

4. The letters of the word **CABIN** are arranged at random. What is the probability that one arrangement chosen at random will begin and end with a vowel?

5. The letters of TOMATO are arranged at random. What is the probability that an arrangement begins and ends with a T?

