

Probability 1

chapter

1

Section 1.2 Combinations

(order doesn't matter)

$${}^n C_r = \binom{n}{r}$$

$${}^{42} C_6 = 5,245,786$$

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Example 1

- In how many ways can a team of 5 players be chosen from 9 players?
- In how many ways can this be done if a certain player must be selected in each team?

$$(i) \binom{9}{5} = 126$$

$$(ii) \underbrace{[1]}_{\text{one player}} \times \underbrace{\left[\binom{8}{4} \right]}_{\text{others}} = 70$$

Example 2

In how many ways can a group of five be selected from ten people?

How many groups can be selected if two particular people from the ten cannot be in the same group?

$$(i) \quad \binom{10}{5} = 252$$

$$(ii) \quad \left[\binom{2}{1} \right]_{\substack{\text{one of} \\ \text{the } 2}} \times \left[\binom{8}{4} \right]_{\substack{\text{4 of others}}} = 140$$

Example 3

Find the number of ways in which a panel of four men and three women can be chosen from seven men and five women.

$$\binom{7}{4} \times \binom{5}{3}$$

4 men x 3 women