

Class Exercise 5

1. Search and Rescue Operations

A group of 56 volunteers has assembled to assist in a search and rescue operation in a national park. The incident coordinator needs to divide the volunteers into four field search parties:

- Team Alpha: 15 members
- Team Bravo: 12 members
- Team Charlie: 11 members
- Team Delta: 10 members

The remaining volunteers will stay behind at Headquarters (HQ) to coordinate communications and logistics.

- a. In how many ways can the 56 volunteers be assigned to the four search parties and the headquarters team? (You may leave your answer in factorial or combination notation.)
- b. Two of the volunteers, Maria and David, are experienced radio dispatchers and must both be assigned to the headquarters team. In how many ways can the assignments now be made?
- c. If assignments are made completely at random, what is the probability that both Maria and David end up assigned to the headquarters team?

2. The Birthday Problem

Assume there are 365 days in a year and all birthdays are equally likely.

- a. In a group of 60 randomly selected people, what is the probability that at least two people share the same birthday?
- b. You are in a group of 60 randomly selected people. What is the probability that no one else in the group shares your birthday?