Permutation or combination?

2024-10-04

Questions: Permutation or Combination?

Due October 4, 2024.

Go through the questions and write down whether the questions are permutations or combinations.

Choose 2 permutation and 2 combination problem to solve and show your work.

Bonus (Win a sticker): Write your own permutation and/or combination question (think about some of the use cases we brainstormed in class) and show the solutions.

1. **Student Club Officers:** A student club needs to elect a president, vice president, and secretary from a group of 7 members. In how many ways can these three officers be chosen?

2. **Selecting a Research Team:** A professor wants to choose 4 students out of 10 to join her research team. In how many ways can the students be selected?

3. **Forming a Study Group:** A group of 5 students wants to form a study group, but they will sit in a specific order around a round table. How many different seating arrangements are possible?

4. **Assigning Dorm Rooms:** 10 students are applying for 5 single rooms in a dormitory. The rooms are identical. In how many ways can 5 students be assigned a room?

5. **Choosing Books for a Course:** A literature professor needs to select 3 books out of 8 for a course syllabus. The order in which the books are read does not matter. How many different selections are possible?

6. **Organizing a Science Fair:** In a science fair, 6 projects are submitted. Three prizes will be awarded: first place, second place, and third place. In how many ways can the three prizes be awarded?

7. **Scheduling Speakers for a Conference:** A conference organizer needs to schedule 4 speakers for different time slots throughout the day. In how many ways can the organizer schedule the speakers?

8. **Forming a Mixed Committee:** A new committee is to be formed with 2 faculty members and 3 students from a pool of 6 faculty members and 8 students. How many different committees can be formed?

9. **Arranging Books on a Shelf:** A student has 7 different books and wants to arrange them on a shelf. In how many different ways can the books be arranged?