

Introduction

The topic of the day was **Permutations**. The learning objectives were to

- Learn to compute $P(n, k)$ for different values of n and k
- Solve simple word problems involving $P(n, k)$
- See the factorial formula for $P(n, k)$

Session 1

We introduced the idea of permutations with the problem of two friends choosing ice creams after the other from four different flavors. We listed the number of possible choices in a table. We looked at variations of the problem with different number of ice cream flavors and friends. That got us to the formula $P(n, k) = n \times (n - 1) \times \dots \times (n - k + 1)$. We then had the students compute $P(n, k)$ for a table of n and k pairs. We discussed answers for the $P(n, k)$ computation together.

Session 2

We had a whole set of simple word problems where we need to identify the values of n and k to compute $P(n, k)$ as answer to the problem. We did a few problems together and had the students solve the rest of the problems on their own. We discussed the answers together as a class. We had a few challenge problems on permutations with conditions at the end. The challenge problems were meant for upper class students. It turned out to be hard for the younger students.

Observations

Students participated well in the discussions. We did not expect the younger students (classes 4-6) to get to the challenge problems, but they did and they found it hard, which was expected. Overall, we are positive that the learning objectives were met.