

MATH 5: HOMEWORK 18
CHOOSINGS AND PERMUTATIONS.

1. In a certain club of 30 people, they are selecting a president, vice-president, and a treasurer (they all must be different people: no one is allowed to take two posts at once). How many ways are there to do this?

2. A group of 6 club members always dine at the same table in the club; there are exactly 6 chairs at the table. They decided that each day, they want to seat in a different order. Can they keep this for a year? Two years?

3. How many ways are there to seat 15 students in a classroom which has 15 chairs? If the room has 25 chairs?

4. A small theater has 50 seats. One day, all 50 seats were taken – but the people took seats at random, paying no attention to what was written on their ticket.
 - (a) What is the probability that everyone was sitting in the right seat (i.e., the one written in his ticket)?

 - *(b) What is the probability that no person was sitting in the right seat?

5. A puzzle consists of 9 small square pieces which must be put together to form a 3×3 square so the pattern matches (this kind of puzzles is actually quite hard to solve!). It is known that there is only one correct solution. If you started trying all possible combinations at random, doing one new combination a second, how long will it take you to try them all?

6. (a) How many 5s are there in the prime factorization of the number $100!$? How many 2s?

(b) In how many zeroes does the number $100!$ end?

7. 10 people must form a circle for some dance. In how many ways can they do this?