1. (50 points) Check all the correct statements.

□ The number of different strings you can get by reordering letters in the word aabbc is 30.
□ There are 25 different strings of length 5 over the alphabet with two letters.
□ If you have 26 balls in 5 boxes, then there is a box with at least 6 balls.
□ There are 6 different surjective functions from \([3]\) to \([2]\).
□ There are 15 variants to put 4 identical balls into 3 different boxes.

2. (10 points) Let us assume that we are given \(\ell\) lines that are not parallel to each other. Prove that there are at least two of them such that angle between them is at most \(\pi/\ell\).
3. (10 points) Prove that for all integers $n > 0$, the sum $\frac{1}{1^2} + \frac{1}{2^2} + \cdots + \frac{1}{n^2}$ is at most 2.
4. (10 points) Find a closed formula (no summation signs) for the expression $\sum_{i=1}^{n} i^2 \binom{n}{i} (-1)^i$. 
5. (10 points) Find a closed formula (no summation signs) for the expression $S(n, n - 2)$. 