11^{th} BALKAN MATHEMATICAL OLYMPIAD
Novi Sad, Yugoslavia, 1994

1. Consider the angle XOY and P inside this angle. Construct the line *d* passing through P using the ruler and the compass such that the area of OAB is OP^2 where A and B are the intersections of OX and OY with *d*.

2. Prove that the polynomial $x^4 - 1993x^3 + (1993 + m)x^2 - 11x + m$ has at most one integer root.

3. If $(a_1, a_2, \ldots, a_n)$ is a permutation of the set $\{1, 2, \ldots n\}$ where *n* is a fixed positive integer, find the maximum value of the sum $|a_1 - a_2| + |a_2 - a_3| + \ldots + |a_{n-1} - a_n|$

4. Find the least integer $n > 4$ such that there exists a set of *n* persons with the following properties:
   - for any two persons that do not know each other there are no common acquaintances
   - any two persons that do not know each other have exactly two common friends.

   It is assumed that if A has B as his friend then also B has A as its friend.