Problem 1. Find out the remainder when the number

$$1^{37} + 2^{37} + \cdots + 2024^{37}$$

is divided by 2025.

Problem 2. The YumYum language is written in a mixture of Russian and English characters. Here is a little poem in YumYum with the translatio

Ам ту му ям.	=	Giant cat was scary.
Ту ля бу ам.	=	Mouse saw giant cat.
Гу ля ту ям.	=	Scary cat ate mouse.

Based on this, construct a fragment of a YumYum-English dictionary.

Problem 3. At a party, everyone shakes hands with everyone else. If there were 45 handshakes, how many people were at the party?

Problem 4. From the set of numbers $1, 2, \ldots, 50$, twenty-six numbers are chosen. Can there exist a pair (a, b) such that a divides b or b divides a?

Problem 5. Two towns are near a straight highway. Where on the highway should a joint bus stop be located so that the sum of the distances from it to the towns will be the least if the towns are:

(a) on opposite sides of the highways;

(b) on the same side of the highways.

Problem 6. Twenty points are placed on a sheet of paper and a line is drawn through every two points. What is the least and what is the greatest number of different lines that might be formed?

Problem 7. Suppose that integers a, b and c are such that $ax^2 + bx + c$ is divisible by 5 for any integer x. Prove that each of a, b and c is divisible by 5.