3. Reasoning and graphs. 30.03.2020

13. In the small county of Lipshire, there are only 5 estates, some of them are connected by roads. It is known that any two roads have a common end. Prove that there are three estates, which are not connected with each other by road.

14. 60 people came to the party. It is known that among any three of them, there is one familiar with the two remainings. What is the smallest number of pairs of acquaintances among these 60 people?

15. 10 volleyball teams held the tournament in one round. It turned out that among any three of these teams, there is a team that won the other two. Prove that among these teams, there is one that lost to everyone.

16. 78 people of different ages played tennis. 310 games were played. (Each has played at most one game with each other, there are no draws in tennis.) Prove that there are 4 people, among whom the oldest or the youngest won the remaining three.