2. Reasoning. 30.03.2020

9. There are 40 balls in a basket. If we take any 17 balls from the basket, at least one of them will be red. If we take any 25 balls from the basket, at least one of them will be black. How many red balls can be in the basket? (Give all possible answers.)

11. The school has 298 children. All children have different weights as well as different height. It is known that no matter what 150 children you take, the tallest of them will turn out to be the heaviest of them at the same time. Prove that you can choose 150 children in such a way that the lowest of them will be at the same time the easiest of them.

10. In the cells of a 7×7 square there are 100 crosses. There are three horizontal lines, in the cells of which a total of at least 70 crosses were contained, and three such verticals. Prove that either there is a cell without a single cross in it, or there is a cell in which there are at least seven crosses. (Both situations are also acceptable.)

12. There is a set of $4n$ positive numbers. It is known that arithmetic progression can be made up of any four pairwise different numbers of this set. Prove that there are at least n identical numbers in the set.