

SEMINAR LESSON 7

Logic and Propositional calculus

- 1) I have apples, and you have apples. You say – give me two apples then we will have the same number of apples. To which I reply – you better give me two apples, then I will have two times more apples than you. How many apples we have?
- 2) At this moment Serik is 11 years old and Marat is 1 year old. How many years will be Serik and Marat, when Serik becomes three times older than Marat?
- 3) The clock shows one o'clock. Find the nearest point of time when the hour and minute hands coincide.
- 4) How to get exactly one liter via three-liter and five-liter bottles?
- 5) Aizhan brought to the market for sale a basket of apples. For the first buyer she sold half of her apples and gave a half-apple as a gift, for the second – half of the remaining apples and a half-apple as a gift again, and etc. For the latter – for the sixth buyer – she also sold half of the remaining apples and gave a half-apple as a gift, and it turned out that she had sold all her apples. How many apples did Aizhan bring for sale to the market?
- 6) Mother put on the table plums and said for her three sons that when they came home from school to divide plums equally. Medet came first, and he took one third of plums and left. Then Askar came back from school, and took one third of plums lying on the table and left, too. Then came Kayrat and also took one third of the plums that he saw. How many plums mother left for her sons if Kayrat took 4 plums?
- 7) Both of us together 63. Now I am two times older than you were when I was the same age as you are now. How many years are now me and you?
- 8) Three smart men came once to the Great Sage. And asked him to judge – who is the smartest one. The Great Sage gave them a match. He showed them three red caps and two blue caps. Then set them in a circle, close their eyes and put on each one of these five caps. After opening the eyes, each sees the other two, but cannot see own cap. They sit in silence, and thinking. Who first understand what color his cap – he will be the smartest man. If all three caps put on them by the Great Sage were red, how one of these smart man after a while was able to find the correct answer (the color of his cap)?
- 9) Askar, Kayrat, Maksat and Timur late for a business meeting. It is night, around dark. They have only one flashlight for all. This meeting should be held on the opposite bank of the river. Bridge is weak, and it can withstand maximum two people at the same time. They have only 17 minutes to cross over the bridge to the other side and not to be late. They cannot go without the flashlight. Speeds, crossing the bridge, are the following: Askar spends 1 minute, Kayrat – 2, Maksat – 5, Timur – 10. When two people cross the bridge, both speeds are equal to the speed of the slowest of the pair. How do they need to act?
- 10) There is a full deck of 52 cards on the table in a dark room. Exactly 10 of them – face-up, others – face-down. There is no chance to distinguish them in the darkness. It is necessary to divide these 52 cards into two groups (the number of cards in the groups are not necessarily equal), such that these groups have the same number of face-up cards. How to do it?