

4. Two (or more) indistinguishable situations. 04.04.2020

Example. It's impossible to determine numbers a , b and c when we know ab , bc , ca .

17. Each of the 5 numbers is 0 or 1. For any two you can find out their product. Using this operation you can determine all numbers. What is the largest possible number of zeros among the original numbers can be?

18. In each cell of the table 5×5 a real number is written. You can find out the sum of numbers in any rectangular 1×2 . Prove that initially the numbers could be arranged in such a way that the sum of all numbers in the table cannot be found from the answers received.

19. The teacher wrote a two-digit number on the board and asked Dima in is it divisible by 2? by 3? ... by 9? Dima answered all eight questions correctly, and the answers were "yes" and "no" equally (four "yes" and four "no").

a) Can you answer at least one of the teachers questions, not knowing the number itself?

b) Can you answer at least two of the teachers questions, not knowing the number itself?

20. a) All plant species of one country were numbered in a row by integers from 2 to 2018 (each number appears exactly one time). For each pair of plant species, they remembered the greatest common divisor of their numbers, and the numbers themselves were forgotten. Is it possible to restore its number for each type of plant?

b) The same problem but with 2018 replaced by 10^{10000} .