

## Combinatorics - Exercises

1. In how many ways can you arrange 7 people in a row.=?
2. How many words (not necessarily meaningful) can you make from all the letters in the word COMBINATORICS?
3. In a qualification round of a sports event there are 20 competitors. The first free gain qualification to the next round. How many possible outcomes are there?
4. How many ways are there to fill a Duży Lotek lottery ticket?
5. How many 4 digit numbers have all different digits?
6. In a sports event there are 30 competitors and the best three are awarded the gold, silver and bronze medals. How many possible outcomes are there?
7. We throw a coin 10 times and we number individual throws (e.g. throw 1, throw 2,...). How many different outcomes are there?
8. In how many ways can you write all the digits in a row such that 4 and 5 are neighbouring?
9. In a group of 15 girls and 10 boys we choose a 5 children delegation, in which there must be exactly 3 girls. In how many ways can this be done?
10. On the shelf there are 2 novels, 4 textbooks and 3 albums. In how many ways can we arrange them in such way that the books of each kind are next to each other?
11. In how many ways can you put 5 letters into 8 mailboxes, if you can put only one letter in each mailbox?
12. 8 people want to register for 4 courses. How many possibilities are there?
13. In a hat there are 4 blue balls, 3 green balls and 2 white balls. In how many ways can we draw 3 balls (without putting them back into the hat, order of the draws matters) such that at least one ball is white? In how many ways can we draw 3 balls (without putting them back into the hat, order of the draws matters) such that every

ball is in a different color?

14. How many different registration plates can be issued, if first two characters are letters and next three are digits.
15. In a tennis tournament there are 32 competitors. In how many ways can we arrange them in first round pairs?
16. In how many ways can we deal 52 cards to 4 players?
17. In how many ways can we split a 17 people group into two 3-person groups, one 5-person group and three 2-person groups?