CS30 (Discrete Math in CS), Summer 2021 : More Combinatorics Practice

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Problem 1.
Suppose you have a jar with 15 marbles containing 5 each of 3 different colors : Red, Blue, Green. You remove all marbles one at a time. How many different sequences of removal are there?

Problem 2.
You are planning to take a fruit basket to a party. The basket you have can hold 7 fruits (irrespective of which fruit). At the supermarket you find 5 possibilities : apples, bananas, cantaloupes, pineapples, and watermelons. How many different fruit baskets are possible?

Problem 3.
Suppose 27 students get together to play soccer. There are three different fields to practice on. How many different ways are there to assign these 27 players to the 3 fields in teams of 9.

Problem 4.
In the word game Scrabble, players end their turns by picking letter tiles to replace ones just used. Suppose at some point the bag had 6 As, 6Bs, 6Cs, 6Ds, and 6Es. And you had to pick 4 tiles onto your rack. How many ways are there to do this?

Problem 5. ☯
Same question as above, except you had to pick 7 tiles onto your rack from a bag containing 6As, 6Bs, 6Cs, 6Ds, and 6Es. How many ways are there to do this?