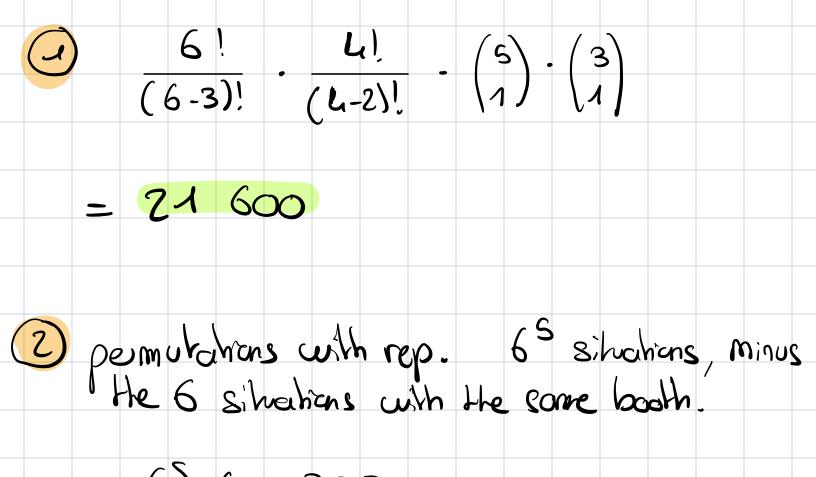


Exerc	cise 1. H	low man	y differe	ent word	ds can w	e make l	by rearra	anging t	he lette	ers in the	e word F	PASSWO	ORD?		
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Exerc	cise 2. A	An exan	n has 12	questic	ons, with	n 4 poss	sible ans	swers for	r each o	question	. How	many st	udents		
shoul	d compl	lete the	exam to	ensure	that at	least 3	student	s will su	ıbmit tl	ne exact	same a	nswers?			
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**Exercise 3.** You are leading the organization of a complex school event, which includes multiple activities like setting up booths, managing teams, and sending invitations.

- 1. The event invitations include a unique identifier consisting of 3 distinct letters from a to f included, and 2 distinct digits from 0 to 3 included. Additionally, each invitation has one of five different colors and can be printed in one of three different fonts. How many unique invitations can be created?
- 2. You have an unlimited supply of 6 different types of booths to choose from. You need to arrange five booths in a row, but at least two of them must have a different type. In how many different ways can you arrange the 5 booths in a row?
- 3. You need to form a team of 4 volunteers from a group of 6 bachelor students and 5 master students. The team must have at least one master student. The team will be given 4 hats: 2 red, one blue, and one green. How many different team compositions and hats assignments are possible?
- 4. You have an unlimited supply of 12 different gift types:  $\{G_1, G_2, \cdots G_{12}\}$ , and you need to create gift packages containing exactly 5 gifts. Each package must include a gift of type  $G_5$ . How many different gift packages can be prepared?
- 5. Finally, you're tasked with designing unique name badges. Due to a unique design theme, each badge name must include all vowels ('A', 'E', 'I', 'O') exactly once, and all consonants ('C', 'L', 'B') exactly twice. How many different badge names can be designed under these conditions?



$$3(5)+(6)+(5)+(6)+(6)+(6)+(6)+(6)+(6)+(1)$$

$$\begin{pmatrix} 4+12-1\\ 12-1 \end{pmatrix} = 1365$$

separators for the M2

types of gifts

<b>Exercise 5.</b> The number of distinct <i>n</i> -tuples $(x_0, x_1, x_2,, x_{n-1})$ of integers $x_0, x_1, x_2,, x_{n-1}$ such that $x_i \ge i$ for $0 \le i < n$ and $\sum_{i=0}^{n-1} x_i \le \frac{n(n+1)}{2}$ equals
$\bigcirc \binom{2n}{n}$ .
$\bigcirc \binom{2n+1}{n}$ .
$\bigcirc \binom{2n-1}{n}$ .
$\bigcirc \binom{2n-1}{n-1}$ .
we first place all the regursed no in each
Soc Just Park Au 116 1991 and 118 117 Car
That means we have already placed
(n-1)(n) elements (because ue startat 0)
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$\bigcap (\bigcap \leftarrow \land)$
$x_0 + x_1 + \dots + x_{n-1} + x_{traph} =$
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2 2 n+1 boxes.
Count - 1
(n+(n+1)-1)
(0+1)-1