



Student No.:	Date: / /	Score:
Student Name:		/36

Revision of Permutation and Combination (I)

Exercises

1. Evaluate each of the following expression.

(a) $10! - 9!$

(b) $\frac{P_3^9}{9!}$

(c) $\frac{C_2^{12}}{C_2^8 \times C_3^4}$

(d) $\frac{C_2^7 + C_3^7}{P_4^7}$

2. Thomas is going to choose a bottle of juice at a supermarket. The number of brands of different kinds of juice are shown below. How many different choices does she have?

Juice	Number of brands
Kiwi juice	8
Melon juice	2
Strawberry juice	5

3. The letters and digits in the word 'NODE32' are arranged to form the security code of a door. How many different security codes can be formed?

4. In a Mathematics competition, each candidate is required to solve 2 out of 6 questions. How many ways can a candidate choose for his/her questions?

5. There are 5 symbol cards. To give out a message, all the cards should be used in order. Find the number of all possible messages that can be given out.

S5E-18A

6. In each of the following cases, how many numbers can be formed from the integers 2 to 7?
- (a) 3 different integers are taken to form a 3-digit number each time.
 - (b) 4 different integers are taken to form a 4-digit number each time.
 - (c) All the integers are taken to form a 6-digit number each time.
7. There are 16 kinds of toppings from which a cook can choose when making a hamburger. In each of the following cases, find the number of all possible combinations of toppings.
- (a) The cook chooses 7 kinds of topping for a hamburger.
 - (b) The cook chooses 10 kinds of topping for a hamburger.
8. Suppose each electronic lock requires a password of 6 characters. Each character can be a lower-case letter or a digit. If the password must contain at least one digit, find the number of possible passwords.
9. 7 students are invited to a tea party. In how many ways can they be seated in a row if
- (a) there are no restrictions?
 - (b) the prefect must be in the middle of the row?
10. In a competition, 8 students need to lift a sedan chair for 100 m. Each side of the sedan chair requires 4 students. Suppose 1 student can only lift on the left side, 2 students can only lift on the right side and the remaining 5 students can lift on both sides. Find the number of ways that the teacher can arrange the students.
11. In a regular 12-sided polygon, how many triangles can be formed by any three vertices?

12. The table shows the distribution of students performing in a drama. According to each of the following conditions, find the number of ways of forming a group.

- (a) A group is formed by a boy and a girl.
 (b) A group is formed by a boy and a girl from S4.
 (c) A group is formed by a boy and a girl from the same form.
 (d) A group is formed by 4 students from 4 different forms.

	Boy	Girl
S3	12	9
S4	10	15
S5	11	11
S6	14	17

13. The table shows the number of seats on a plane reserves in different districts. Now the company plans to select 6 of the seats for private usage. According to each of the following conditions, find the number of combinations of seats of choosing.

- (a) 6 seats from districts A are selected.
 (b) 6 seats of economic class are selected.
 (c) 3 seats from districts A, 2 from districts B and 1 from districts C are selected.
 (d) 2 seats of economic class from districts A and 4 from the districts C are selected.
 (e) 6 seats from the same districts are selected.

District	A	B	C
Business Class	2	2	10
Economic Class	7	4	1

14. It is given that Sam has 5 cats, answer the following questions.

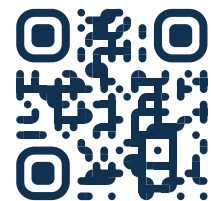
- (a) In how many ways can he arrange them in a row?
 (b) In how many ways can he choose 4 of them if there are no restrictions?
 (c) In how many ways can he choose 4 of them if 2 particular cats must be included?

S5E-18A

15. Find the number of ways that a group of 4 teammates can be chosen from 5 boys and 8 girls when it contains
- (a) people of the same gender.
 - (b) at least one girl.

M.C.

1. If $C_2^n = 15$, find the value of n .
- A. 5
 - B. 6
 - C. 30
 - D. 5 or 6
2. In how many ways can 4 subject prizes be awarded to 10 students, if any student is allowed to win them all?
- A. 10^4
 - B. $10 \times 9 \times 8$
 - C. 4^{10}
 - D. 4×10
3. Sam takes 13 cards from a deck of 52 playing cards. How many different combinations are there for getting the cards with 4 Kings and 4 Queens?
- A. $13! \times 4! \times 4!$
 - B. $4! \times 4!$
 - C. C_5^{44}
 - D. $(4 + 4)!$
4. In how many ways can 4 students queue up in a row if 2 of them cannot stand together?
- A. 6
 - B. 12
 - C. 18
 - D. 24



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