



Name: _____

Date: _____

First decide whether order matters, then count.

- ① A team of 3 is chosen from 7 students.
How many different teams are possible?

$$7 \times 6 \times 5 = 210$$

$$210 \div (3 \times 2 \times 1) = 35$$

- ② A reader takes 3 books from a pile of 10.
How many different sets of books are possible?
- _____

- ③ 10 runners race for 3 different medals. In how many ways can the medals be won?
- _____

- ④ 4 toppings are picked from a list of 6.
How many different pizzas are possible?
- _____

- ⑤ A team of 3 is chosen from 6 students.
How many different teams are possible?
- _____

- ⑥ 4 runners race for 3 different medals. In how many ways can the medals be won?
- _____

- ⑦ 5 runners race for 2 different medals. In how many ways can the medals be won?
- _____

- ⑧ 8 students take the 4 seats in the front row, one to a seat. In how many ways can they sit?
- _____



Permutations and combinations · Permutations and combinations

— Answer key



1. A team of 3 is chosen from 7 students. How many different teams are possible? $\rightarrow 7 \times 6 \times 5 = 210$, $210 \div (3 \times 2 \times 1) = 35$

2. A reader takes 3 books from a pile of 10. How many different sets of books are possible? $\rightarrow 10 \times 9 \times 8 = 720$, $720 \div (3 \times 2 \times 1) = 120$

3. 10 runners race for 3 different medals. In how many ways can the medals be won? $\rightarrow 10 \times 9 \times 8 = 720$

4. 4 toppings are picked from a list of 6. How many different pizzas are possible? $\rightarrow 6 \times 5 \times 4 \times 3 = 360$, $360 \div (4 \times 3 \times 2 \times 1) = 15$

5. A team of 3 is chosen from 6 students. How many different teams are possible? $\rightarrow 6 \times 5 \times 4 = 120$, $120 \div (3 \times 2 \times 1) = 20$

6. 4 runners race for 3 different medals. In how many ways can the medals be won? $\rightarrow 4 \times 3 \times 2 = 24$

7. 5 runners race for 2 different medals. In how many ways can the medals be won? $\rightarrow 5 \times 4 = 20$

8. 8 students take the 4 seats in the front row, one to a seat. In how many ways can they sit? $\rightarrow 8 \times 7 \times 6 \times 5 = 1680$