

# Combinations

(pages 551–553)

An arrangement, or listing, of objects in which order is not important is called a **combination**. You can find the number of combinations of objects by dividing the number of permutations of the entire set by the number of ways each smaller set can be arranged.

## EXAMPLE

How many combinations of two menu items can be chosen from a menu of four items?

*There are  $4 \times 3$  permutations of two items chosen from the menu of four.*

*There are  $2!$  or  $2 \times 1$  ways to arrange the two items.*

$$\frac{4 \times 3}{2 \times 1} = \frac{12}{2} \text{ or } 6$$

*There are 6 combinations of two menu items that can be chosen from the menu of four items.*

## Try These Together

**Solve each problem.**

- How many ways can a three-topping pizza be made if the chef must choose from seven ingredients? Assume all three toppings are different.
- There are four computer-programming jobs to fill from a pool of six applicants. How many ways can four programmers be chosen?

## PRACTICE

**Solve each problem.**

- In how many ways can 2 flight attendants be selected from a group of 5 to work a flight?
- Any five Supreme Court justices comprise a majority for the group of nine justices. How many groups of five are there?



- Standardized Test Practice** How many ways can a four-member debate team be selected from a group of eight students?

**A** 60

**B** 70

**C** 80

**D** 90

Answers: 1. 35 2. 15 3. 10 4. 126 5. B