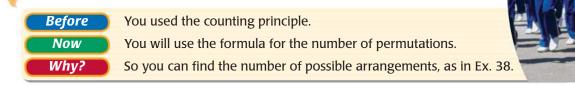
13.2 Find Probabilities Using Permutations



Key Vocabulary

• permutation

• n factorial

A **permutation** is an arrangement of objects in which order is important. For instance, the 6 possible permutations of the letters A, B, and C are shown.

ABC ACB BAC BCA CAB CBA

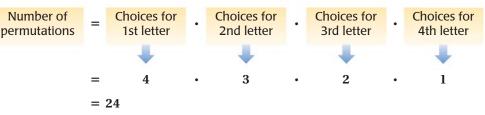
EXAMPLE 1 Count permutations

Consider the number of permutations of the letters in the word JULY.

- a. In how many ways can you arrange all of the letters?
- **b.** In how many ways can you arrange 2 of the letters?

Solution

a. Use the counting principle to find the number of permutations of the letters in the word JULY.



- There are 24 ways you can arrange all of the letters in the word JULY.
- **b.** When arranging 2 letters of the word JULY, you have 4 choices for the first letter and 3 choices for the second letter.

Number of permutations = Choices for 1st letter • Choices for 2nd letter = $4 \cdot 3$ = 12

There are 12 ways you can arrange 2 of the letters in the word JULY.

 \checkmark

GUIDED PRACTICE for Example 1

- 1. In how many ways can you arrange the letters in the word MOUSE?
- 2. In how many ways can you arrange 3 of the letters in the word ORANGE?

REVIEW COUNTING PRINCIPLE

For help with using the counting principle, see p. 931.