

## PRACTICE AND PROBLEM SOLVING

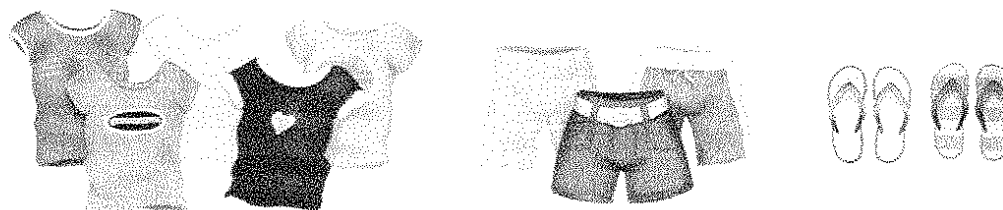
For Exercises	See Example
12–13	1
14–15	2
16–17	3
18–19	4

### Extra Practice

Practice p. 523

Lesson Practice p. 537

12. Maria looks in her closet and exclaims, “I have nothing to wear!” How many different outfits of one shirt, one pair of shorts, and one pair of sandals are possible using the items shown?



13. When a customer buys tickets for a concert, the ticket office assigns a confirmation code that is made up of 2 lowercase consonants, followed by a 3-digit number from 000 to 999. A letter or digit may be repeated. How many different confirmation codes are possible?

For Exercises 14 and 15, tell whether each situation involves combinations or permutations. Then give the number of possible outcomes.

14. A team of archeologists divides a dig site into 3 areas. They dig one area at a time. How many different ways can they order the 3 areas?

15. To decide which team will lead the class discussion, a teacher writes the names of 5 students on slips of paper and puts them in a hat. Then she draws 2 names. How many teams of two are possible?

16. The code for a bicycle lock is made up of 4 digits from 0 through 9. How many different codes are possible?

17. A television station has 5 different commercials to play during the news. In how many different ways can they order the commercials?

18. David's summer reading list has 9 books. How many different ways can David select 3 books to read?

19. Steve draws a hand of 7 cards from a deck of 52 different cards. How many different hands are possible?

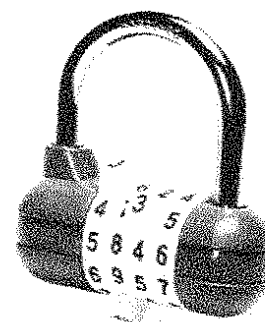
20. **History** The North American Numbering Plan (NANP) was first used in 1947. It is a system for assigning telephone numbers and area codes.

- Originally, the NANP allowed only 3-digit area codes whose first digit was not 0 or 1, and whose second digit was always 0 or 1. How many different area codes were possible under this system?
- In 1995, because of increased demand, the NANP removed the restriction that the second digit of the area code must be 0 or 1. How many more area codes did this make possible?

21. **Critical Thinking** For  $n = 6$  and  $r = 2$ , which is larger:  ${}_nP_r$  or  ${}_nC_r$ ? Explain why this is true.

22. **Write About It** Explain why a “combination lock” should be called a “permutation lock.”

23. **Write About It** You roll a number cube 6 times. Explain how to determine the number of possible outcomes. Would a tree diagram be useful in solving this problem? Explain why or why not.



LINK

tory

phone “numbers” can be made up of letters and several digits. Calls were made by speaking the phone number to a central operator, who then connected the call.