



## Practice (Average)

### The Counting Principle

State whether the events are *independent* or *dependent*.

1. choosing an ice cream flavor and choosing a topping for the ice cream **independent**
2. choosing an offensive player of the game and a defensive player of the game in a professional football game **independent**
3. From 15 entries in an art contest, a camp counselor chooses first, second, and third place winners. **dependent**
4. Jillian is selecting two more courses for her block schedule next semester. She must select one of three morning history classes and one of two afternoon math classes. **independent**

Solve each problem.

5. A briefcase lock has 3 rotating cylinders, each containing 10 digits. How many numerical codes are possible? **1000**
6. A golf club manufacturer makes irons with 7 different shaft lengths, 3 different grips, 5 different lies, and 2 different club head materials. How many different combinations are offered? **210**
7. There are five different routes that a commuter can take from her home to the office. In how many ways can she make a round trip if she uses a different route coming than going? **20**
8. In how many ways can the four call letters of a radio station be arranged if the first letter must be W or K and no letters repeat? **27,600**
9. How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1, and any digit can be repeated? **8,000,000**
10. How many 7-digit phone numbers can be formed if the first digit cannot be 0, and any digit can be repeated? **9,000,000**
11. How many 7-digit phone numbers can be formed if the first digit cannot be 0 or 1, and if no digit can be repeated? **483,840**
12. How many 7-digit phone numbers can be formed if the first digit cannot be 0, and if no digit can be repeated? **544,320**
13. How many 6-character passwords can be formed if the first character is a digit and the remaining 5 characters are letters that can be repeated? **118,813,760**
14. How many 6-character passwords can be formed if the first and last characters are digits and the remaining characters are letters? Assume that any character can be repeated. **45,697,600**



## 6-2 Practice (Average)

### Permutations and Combinations

Evaluate each expression.

1.  $P(8, 6)$  **20,160**
2.  $P(9, 7)$  **181,440**
3.  $P(3, 3)$  **6**
4.  $P(4, 3)$  **24**
5.  $P(4, 1)$  **4**
6.  $P(7, 2)$  **42**
7.  $C(8, 2)$  **28**
8.  $C(11, 3)$  **165**
9.  $C(20, 18)$  **190**
10.  $C(9, 9)$  **1**
11.  $C(3, 1)$  **3**
12.  $C(9, 3) \cdot C(6, 2)$  **1260**

Determine whether each situation involves a *permutation* or a *combination*. Then find the number of possibilities.

13. selecting a 4-person bobsled team from a group of 9 athletes  
**combination; 126**
14. an arrangement of the letters in the word *Canada*  
**permutation; 120**
15. arranging 4 charms on a bracelet that has a clasp, a front, and a back  
**permutation; 24**
16. selecting 3 desserts from 10 desserts that are displayed on a dessert cart in a restaurant  
**combination; 120**
17. an arrangement of the letters in the word *annually*  
**permutation; 5040**
18. forming a 2-person sales team from a group of 12 salespeople  
**combination; 66**
19. making 5-sided polygons by choosing any 5 of 11 points located on a circle to be the vertices  
**combination; 462**
20. seating 5 men and 5 women alternately in a row, beginning with a woman  
**permutation; 14,400**
21. **STUDENT GROUPS** Farmington High is planning its academic festival. All math classes will send 2 representatives to compete in the math bowl. How many different groups of students can be chosen from a class of 16 students? **120**
22. **PHOTOGRAPHY** A photographer is taking pictures of a bride and groom and their 6 attendants. If she takes photographs of 3 people in a group, how many different groups can she photograph? **56**
23. **AIRLINES** An airline is hiring 5 flight attendants. If 8 people apply for the job, how many different groups of 5 attendants can the airline hire? **56**
24. **SUBSCRIPTIONS** A school librarian would like to buy subscriptions to 7 new magazines. Her budget, however, will allow her to buy only 4 new subscriptions. How many different groups of 4 magazines can she choose from the 7 magazines? **35**

# 6-3 Skills Practice

## Probability

Ahmed is posting 2 photographs on his website. He has narrowed his choices to 4 landscape photographs and 3 portraits. If he chooses the two photographs at random, find the probability of each selection.

1.  $P(2 \text{ portrait}) = \frac{1}{7}$

2.  $P(2 \text{ landscape}) = \frac{2}{7}$

3.  $P(1 \text{ of each}) = \frac{4}{7}$

The Carubas have a collection of 28 video movies, including 12 westerns and 16 science fiction. Elise selects 3 of the movies at random to bring to a sleep-over at her friend's house. Find the probability of each selection.

4.  $P(3 \text{ westerns}) = \frac{55}{819}$

5.  $P(3 \text{ science fiction}) = \frac{20}{117}$

6.  $P(1 \text{ western and } 2 \text{ science fiction}) = \frac{40}{91}$

7.  $P(2 \text{ westerns and } 1 \text{ science fiction}) = \frac{88}{273}$

8.  $P(3 \text{ comedy}) = 0$

9.  $P(2 \text{ science fiction and } 2 \text{ westerns}) = 0$

For Exercises 10–13, use the chart that shows the class and gender statistics for the students taking an Algebra 1 or Algebra 2 class at La Mesa High School.

If a student taking Algebra 1 or Algebra 2 is selected at random, find each probability. Express as decimals rounded to the nearest thousandth.

10.  $P(\text{sophomore/female}) = 0.208$

11.  $P(\text{junior/male}) = 0.143$

12.  $P(\text{freshman/male}) = 0.136$

13.  $P(\text{freshman/female}) = 0.145$

Class/Gender	Number
Freshman/Male	95
Freshman/Female	101
Sophomore/Male	154
Sophomore/Female	145
Junior/Male	100
Junior/Female	102

Find the odds of an event occurring, given the probability of the event.

14.  $\frac{5}{8}$  **5:3**

15.  $\frac{2}{7}$  **2:5**

16.  $\frac{3}{5}$  **3:2**

17.  $\frac{1}{10}$  **1:9**

18.  $\frac{5}{6}$  **5:1**

19.  $\frac{5}{12}$  **5:7**

Find the probability of an event occurring, given the odds of the event.

20. 2:1  $\frac{2}{3}$

21. 8:9  $\frac{8}{17}$

22. 4:1  $\frac{4}{5}$

23. 1:9  $\frac{1}{10}$

24. 2:7  $\frac{2}{9}$

25. 5:9  $\frac{5}{14}$