

11-1

Practice

Form K

Permutations and Combinations

Use the Fundamental Counting Principle to solve the following problems.

1. You must make a password for your email account. The password must consist of two letters followed by four digits. How many different passwords are possible?
2. Your father is buying a sport coat, a pair of pants, and a tie. Sport coats come in 6 different colors. Pants come in 4 different colors. There are 25 different tie styles to choose from. How many different combinations are possible?

Evaluate each expression.

3. $6!$

4. $5!4!$

5. $\frac{9!}{7!}$

Find the number of permutations in the following problems.

6. Your coach has twelve team jerseys numbered from 1 through 12. He plans to give one jersey to each of the twelve members of the basketball team. In how many ways can the jerseys be assigned?
7. The owner of a car lot is lining up 7 cars in the show-room window. In how many ways can the cars be ordered?

Evaluate each expression.

8. ${}_5P_3$

9. ${}_8P_5$

10. ${}_{11}P_5$

11. Twelve different types of pizza are being judged in a contest. In how many different ways can the pizzas be judged first, second, third, and fourth?

11-1

Practice (continued)

Form K

Permutations and Combinations

Evaluate each expression.

12. ${}_{7}C_{2}$

13. ${}_{9}C_{5}$

14. ${}_{12}C_{7}$

15. ${}_{8}C_{6}$

16. $5({}_{6}C_{3})$

17. ${}_{10}C_{7} + {}_{5}C_{2}$

Decide whether to use a permutation or a combination for each situation. Then solve the problem.

18. An ice cream parlor offers 14 different types of ice cream. In how many different ways can you select 5 types of ice cream to sample?
19. Eleven groups entered a science fair competition. In how many ways can the groups finish first, second, and third?
20. Your aunt is ordering appetizers for her and her family. The restaurant offers 10 different appetizers. She will select 4 appetizers. How many different combinations of appetizers can your aunt possibly select?
21. **Error Analysis** Your friend is shopping for blue jeans. The clothing store offers 18 different types of blue jeans, and your friend will buy 5 different types. Your friend believes that she has 1,028,160 different combinations that she could possibly select. What error did your friend make? How many different combinations could she possibly select?

11-2 Practice

Probability

Form K

Find each experimental probability.

1. A baseball player got a hit in 12 of his last 40 at bats. What is the probability that he will get a hit in his next at bat?
2. A pitcher struck out 8 of the last 32 batters that he faced. What is the probability that he will strike out the next batter that he faces?
3. A student rolled a six-sided number cube 60 times. She rolled the number 4 nine times. What is the experimental probability of rolling a 4?
4. **Reasoning** There are 50 cars in a used car lot. The experimental probability that a car in the lot has two doors is 0.12. How many cars in the lot have two doors?

Explain how you could simulate each situation. Then use your simulation to find each experimental probability.

5. A quiz consists of 12 true-or-false questions. If you guess the answers at random, what is the probability of getting at least 8 correct answers?
6. There are 15 multiple-choice questions on a test. Each question has four answer choices, and only one choice is correct. What is the probability of passing the test by guessing at least 7 of the 15 answers correctly?
7. **Writing** Explain why simulations are sometimes preferable to conducting actual trials.

11-2 Practice (continued)
Probability

Form K

Find each of the following theoretical probabilities.

8. Your classmate rolls a fair number cube. What is the theoretical probability that she will roll a number greater than 4?

9. Shawn rolls a pair of fair number cubes. What is the theoretical probability that he will roll a sum of 3?

10. A box contains 24 green markers, 16 red markers, and 10 blue markers.
 - a. $P(\text{red})$
 - b. $P(\text{green or blue})$
 - c. $P(\text{not green})$

Use combinatorics to find the following theoretical probability.

11. Six of the 32 players on the football team are left-handed. There are 5 starting offensive linemen. What is the theoretical probability that 2 of the starting offensive linemen are left-handed?

Use area to find the following theoretical probabilities.

12. The floor in your friend's house covers 1400 ft^2 . The floor in her bedroom is 14 ft by 10 ft. What is the probability that a randomly selected point on the floor of the house is in your friend's bedroom?

13. A garden is 15 ft by 12 ft. Tomatoes fill a 5 foot by 4 foot section of the garden. A squirrel leaps from a tree into the garden. What is the theoretical probability that the squirrel will land in the tomato section of the garden?