Name _____ Class _____ Date _____

Practice 12-8

Counting Methods and Permutations

Simplify each expression.

1. ${}_7P_2$ **2.** ${}_{12}P_6$ **3.** ${}_{11}P_3$ **4.** ${}_{10}P_3$ **5.** ${}_9P_8$ **6.** ${}_{12}P_7$

7. ${}_{20}P_7$ **8.** ${}_{15}P_3$ **9.** ${}_{16}P_4$ **10.** ${}_{25}P_3$ **11.** ${}_{17}P_2$ **12.** ${}_{15}P_2$

13. Suppose a license plate consists of five different letters.

a. How many five-letter license plates are possible?

b. In how many ways can a five-letter license plate be made with the letters from APRIL if none of the letters are repeated?

c. Suppose a license plate is assigned randomly. What is the probability that it will contain the letters from APRIL?

14. In how many ways can nine mopeds be parked in a row?

15. Suppose there are three different ways in which you could go from your house to a friend's house. From your friend's house, there are four different ways in which you could go to the library. In how many different ways can you go from your house to the library after meeting your friend?

16. A sports card collection contains 20 baseball players, 15 basketball players, and 25 football players. In how many ways can you select one of each?

17. Suppose you are electing student council officers. The student council contains 24 students. In how many ways can a president, a vice-president, and a secretary be elected?

18. Suppose the code to a lock consists of three different numbers from the numbers 1 to 20, inclusive.

a. How many three-number codes are possible?

b. How many of the codes contain the numbers 6, 13, and 17?

19. A car dealer sells four different models of cars. Each of the cars can come in six different colors. For each of the cars, there are two different option packages available. In how many different ways can you select a car?

20. Teams in a math competition consist of six students. In how many ways can the six students be selected to work a problem on the board?