

Name _____

CCM2 Unit 6 Lesson 2 Homework 2

Permutations and Combinations

For 1-5, find the number of permutations.

1. ${}_5P_2$
2. ${}_9P_4$
3. ${}_{11}P_5$
4. How many ways can you plant a rose bush, a lavender bush and a hydrangea bush in a row?
5. How many ways can you pick a president, a vice president, a secretary and a treasurer out of 28 people for student council?

For 6-10, find the probabilities.

6. What is the probability that a randomly generated arrangement of the letters A,E,L, Q and U will result in spelling the word EQUAL?
7. What is the probability that a randomly generated 3-letter arrangement of the letters in the word SPIN ends with the letter N?
8. A bag contains eight chips numbered 1 through 8. Two chips are drawn randomly from the bag and laid down in the order they were drawn. What is the probability that the 2-digit number formed is divisible by 3?
9. A prepaid telephone calling card comes with a randomly selected 4-digit PIN, using the digits 1 through 9 without repeating any digits. What is the probability that the PIN for a card chosen at random does not contain the number 7?
10. Janine makes a playlist of 8 songs and has her computer randomly shuffle them. If one song is by Little Bow Wow, what is the probability that this song will play first?

For 11-13, calculate the number of combinations:

11. ${}_8C_4$
12. ${}_{11}C_5$
13. ${}_{20}C_2$

For 14-18, a town lottery requires players to choose three different numbers from the numbers 1 through 36.

14. How many different combinations are there?
15. What is the probability that a player's numbers match all three numbers chosen by the computer?

16. What is the probability that two of a player's numbers match the numbers chosen by the computer?
17. What is the probability that one of a player's numbers matches the numbers chosen by the computer?
18. What is the probability that none of a player's numbers match the numbers chosen by the computer?
19. Looking at the odds that you came up with in question 14, devise a sensible payout plan for the lottery—in other words, how big should the prizes be for players who match 1, 2, or all 3 numbers? Assume that tickets cost \$1. Don't forget to take into account the following:
 - a. The town uses the lottery to raise money for schools and sports clubs.
 - b. Selling tickets costs the town a certain amount of money.
 - c. If payouts are too low, nobody will play!