Math 13 - Homework 6

Name: _____ **Class Number:** _____

1) Compute the following permutations:

a. $P_{7,2} =$

b. $P_{9,4} =$

c. $P_{3,3} =$

d. $P_{4,0} =$

2) Compute the following combinations:

a. $C_{7,2} =$

b. $C_{9,4} =$

c. $C_{3,3} =$

d. $C_{4,0} =$

3) A sales representative must visit four cities: Chicago, Minnesota, Boston, and Detroit. There are direct air connections between each of the cities. How many diferent choices the sales representative has for the order in which to visit the cities?

4) You need to know the number of different arrangements possible for five distinct letters. You decide to use the permutations rule, but your friend tells you to use 5!. Who is correct? Explain.

5) A college ski team has five entrants in a women's downhill ski event. The coach would like the first, second, and third places to go to the team members. In how many ways can the five team entrants achieve first, second, and third places?

6) There is money to send two of eight tutors to a Warriors game. All tutors want to go, so they decide to choose the members to go to the game by a random process. How many different combinations of two tutors can be selected from the eight who want to go the game?

7) There are 15 qualified applicants for 5 trainee positions in a fast-food management program. How many different groups of trainees can be selected?

8) There are three nursing positions to be filled at a local hospital. Position 1 is the day nursing supervisor; position 2 is the nigth nursing supervisor; and position 3 is the nursing coordinator position. There are 15 candidates qualified for all three of the positions. Determine the number of different ways the positions can be filled by these applicants.

9) You have a combination lock. Again, to open it you turn the dial to the right and stop at a first number; then you turn it to the left and stop at a second number. Finally, you turn the dial to the right and stop at a third number. Suppose you remember that the three numbers for your lock are 2, 9, and 5, but you don't remember the order in which the number occur. How many sequences of these three numbers are possible?

10) A research biologist is studying the effects of fertilizer type, temperature at time of application, and water treatment after application. She has 4 fertilizer types, three 3 zones, and 3 water treatments to test. Determine the number of different lawn plots she needs in order to test each fertilizer type, temperature range, and water treatment configuration.

11) There are five multiple-choice questions on an exam, each with four possible answers. Determine the number of possible answer sequences for the five questions. Only one of the sets can contain all five correct answers. If you are guessing, so that you are as likely to choose one sequence of answers as another, what is the probability of getting all five answers correct?

12) One professor grades homework by randomly choosing 5 out of 12 homework problems to grade.

a. How many different groups of 5 problems can be chosen from the 12 problems?
b. Jerry did only 5 problems of one assignment. What is the probability that the problems he did comprised the group that was selected to be graded?
c. Silvia did 7 problems. How many different groups of 5 did she complete?
d. What is the probability that one of the group of 5 she completed comprised the group selected to be graded?

13) A student council is made up of 4 women and 6 men. One of the women is president of the council. A member of the council is selected at random to report to the dean.

a. What is the probability that a woman is selected?
b. What is the probability that a man is selected?
c. What is the probability that the president of the student council is selected?