Homework Chapter 3

Problems start on page 203 in the textbook. Solutions start on page 219.

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Homework problems for Additional Topic – Counting

Solutions to these problems are posted on other side

A1. How many outcomes do we have for an experiment where we roll six-sided die twice.

A2. A pizza parlor is offering a half-price deal on any pizza with one topping. There are eight toppings from which to choose. In addition, there are three different choices for the size of the pizza, and two choices for the type of crust. In how many ways can a pizza be ordered?

A3. Evaluate: a) 6! b) 95 \( C_5 \) c) 35 \( P_2 \)

A4. Jose has six chemistry books, three history books, and eight statistics books.
   a) He wants to choose one book from each subject to study. In how many ways can he choose the three books?
   b) Once he has chosen the three books, he wants to put them on a special shelf. How many different ways could he arrange these three books on his shelf?

A5. In a certain state, license plates consist of four digits from 0 to 9 followed by three letters. Assume the numbers and letters are chosen at random.
   a) How many license plates can be formed?
   b) How many different license plates have the letters K-I-M in that order?
   c) If your name is Kim, what is the probability that your name is on your license plate? (We are assuming that you are randomly given a license plate, not ordering a personalized one.)

A6. In the Colorado Lottery Lotto game, balls are numbered from 1 to 42. Six balls are drawn. To win the jackpot, you must mark six numbers from 1 to 42 on the ticket, and your numbers must match the numbers on the six balls. The order does not matter. What is the probability that you win the jackpot?

A7. A company has hired 12 new employees, and must assign 8 of them to the day shift and 4 to the night shift.
   a) In how many ways can the assignment be made?
   b) Assume that the 12 employees consist of six men and six women and that the assignments to day and night shift are made at random. What is the probability that all four of the night-shift employees are men?
   c) Would it be considered “unusual” if all four of the night-shift employees are men?
   d) What is the probability that at least one of the night-shift employees is a women?
A8. A computer password consists of eight characters.
a) How many different passwords are possible if each character may be any lowercase letter?
b) How many different passwords are possible if each character may be any lowercase letter or digit?
c) How many different passwords are possible if each character may be any lowercase letter or digit but repetitions are not allowed?

A9. There are 12 members on the board of directors for the Newport General Hospital.
a) If they must elect a chairperson, first vice chairperson, second vice chairperson, and secretary, how many different slates of candidates are possible?
b) If they must form an ethics subcommittee of four members, how many different subcommittees are possible?

Solutions:
1. 36
2. 48
3. a)720  b)126  c)1190
4. a)144  b)6
5. a)175,760,000  b)10,000  c)0.0000569
6. 0.000000191
7. a)495  b)0.0303  c)Yes, b/c 0.0303<0.05  d) 0.9697
8. a)2.09x10^11  b)2.82x10^12  c) 1.22x10^12
9. a)11,880 b)495