Combinatorics Test 70

1) Determine the following:

a) $12!/(8!4!)$ b) ${}_7P_5$ c) $\{(n+1)!k!\}/\{n!(k-1)!\}$

2) A woman has five blouses, four skirts, and two pairs of shoes. How many outfits does she have?

3) A computer code is made of two letters followed by three digits. All letters and digits are different. How many different codes are there?

4) Find the number of permutations of the letters in the following words.

a) desk b) banana

5) Find the number of ways to arrange two white cards and three black cards in a row. An example is shown below.

6)a) Determine ${}_{10}C_6$

b) Solve for r. Find two values. ${}_7C_r = 21$

7) Suppose that for dinner you choose two vegetables from the four available. They are peas, carrots, squash and beets.

a) How many combinations are there?

b) Write down all of the combinations.

8) You have a standard shuffled deck of 52 playing cards. You deal three cards. Answer the following questions.

a) How many different hands can be dealt?

b) How many different hands can be dealt if all of the cards in the hand are black?

c) How many hands can be dealt, if the hands must have red and black cards?

9)a) Expand $(x + y)^7$ =

b) Expand $(2a - b)^4$ =

c) Find the first three terms of $(x + 1)^{50}$ =

Answers: 1)a) 495, b) 2520, c) (n+1)k, 2) 40, 3) 26x25x10x9x8 = 468,000, 4)a) 24, b) 60, 5) 5!/(3!2!) = 10, 6)a) 210, b) 5, 2, 7)a) $_4C_2$ = 6, b) peas and carrots, peas and squash, peas and beets, carrots and squash, carrots and beets, squash and beets, 8)a) $_{52}C_3$ = 22,100, b) $_{26}C_3$ = 2600, c) 22,100 - 2x(2600) = 16,900, 9)a) $x^7 + 7x^6y + 21x^5y^2 + 35x^4y^3 + 35x^3y^4 + 21x^2y^5 + 7xy^6 + y^7$, b) $16a^4 - 32a^3b + 24a^2b^2 - 8ab^3 + b^4$, c) $x^{50} + 50x^{49} + {}_{50}C_2x^{48} = x^{50} + 50x^{49} + 1225x^{48}$.