EE381 Homework #3

1) In how many way can 10 people be seated on a bench if only 4 seats are available?
2) Evaluate
   a) P(8,3)
   b) P(15,1)
   c) P(3,3)
   d) C(7,4)
   e) C(4,4)
3) Four different mathematics books, six different physics books, and two different chemistry books are to be arranged on a shelf. How many different arrangements are possible if
   a) The books in each particular subject must all stand together
   b) Only the mathematics books must stand together
4) How many different salads can be made from lettuce, escarole, endive, watercress, and chicory?
5) How many permutations of *{a, b, c, d, e, f, g}* end with *a*?
6) How many bit strings of length 10 contain:
   a) Exactly four 1s?
   b) At most four 1s?
   c) At least four 1s
   d) An equal number of 0s and 1s?
7) A coin is flipped 10 times where each flip comes up either heads or tails. How many possible outcomes:
   a) Are there in total?
   b) Contain exactly two heads?
   c) Contain at most three tails?
   d) Contain the same number of heads and tails?
8) How many ways are there for 8 men and 5 women to stand in a line so that no two women stand next to each other? (Hint: First position the men and then consider possible positions for the women.)
9) Find the constant term in the expansion of $(x^2 + \frac{1}{x})^{12}$

Note: Your answers should show your step-by-step work. Anwers which have only final results are not accepted.