Worksheet 5

more counting

1. How many ways are there to distribute

   i) 4 distinguishable balls into 10 distinguishable bins if no bin contains more than 1 ball?

   ii) 10 indistinguishable balls into 4 distinguishable bins if each bin contains at least 1 ball?

2. How many permutations of MISSISSIPPI start with I?

3. (*) How many solutions are there to the equation $x_1 + x_2 + x_3 + x_4 = 20$ where x_1, x_2, x_3, x_4 are nonnegative integers where

   i) $x_1 \geq 4$?

   ii) $x_1 \leq 6$?

   iii) $2 \leq x_1 \leq 5$?

4. How many ways are there to deal 8 cards from a deck of 52 cards to 3 players (allowing the possibility of a player getting zero cards) if

   i) the players are distinguishable?

   ii) the players are indistinguishable? (Your answer may be in terms of Stirling numbers.)

5. How many solutions are there to the equation $x_1 + x_2 + x_3 + x_4 = 21$ where the order of the integers x_1, x_2, x_3, x_4 does not matter and $x_1, x_2, x_3, x_4 \geq 4$?