group discussion week 1

problem 1

You have a circular orchard arranged into concentric rings of tree 37 "slots" (one tree per slot). The first ring has 1 slot, the second ring has 6 slots, the third ring has 12 slots, and the fourth ring has 18 slots. You have 100 seeds: 10 Alaskan birch, 20 box-elder maple, 15 cottonwood, 15 Douglas fir, and 40 eastern larch. Cottonwood makes very good lumber and thieves are afoot; therefore you think it best that there not be a some other tree closer to the center of your orchard than any of your cottonwood. You must put trees in all of the slots. Given this how many ways are there to arrange your trees?

problem 2

Given a finite set $\mathcal{S}$ of size n, what is the probability that k subsets will cover $\mathcal{S}$. By cover we mean that a union over them is $\mathcal{S}$.