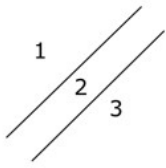


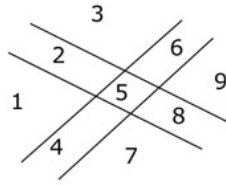
Q1. Find the maximum number of regions in a plane using n pairs of parallel lines. Say that is $P(n)$ (14)

a. Provide necessary recurrence relation and explanation (12)

b. Find the closed form of $P(n)$ (2)



$P(1)=3$



$P(2)=9$

Q2. Suppose there are n people in Josephus's problem. The last two people decided not to kill each other. Find the serial numbers of these two people. Here $n = ((\text{StudentID mod } 1000) \times 2) + 771$ (6)