Combinatorics 2018 HW 4.1

Student ID: Name: Score:

1. Find out the number of lattice paths from (0,0) to (n,n+2), which are above but do not cross y=x line? List the formula with n.

2. Find out the number of lattice paths from (0,0) to (n,n+2), which are above but do not touch y=x line? List the formula with n.

3. If we want to use positive integers from 1 until 7 to form a ring in order. Since 1 and 7 are adjacent to each other in the ring. Due to their neighboring position, 1 and 7 are also considered as neighbor numbers. Then if we want to pick 3 non-neighboring numbers from this ring of 7 numbers, how many different solutions are there?