Combinatorics HW 5-2

Student ID: Name: Score:

1. Integer composition: Integer 5 is partitioned into orderly partitions which are made up by numbers 1,2,3,4. Such as (1+1+3, or 1+3+1 or 2+3, 4+1,....) How many different ways are there?
2. Integer partition: How many ways to partition n into several numbers that the order between numbers is ignored. Please write the corresponding generating function.
3. Provide proof that the partition number for integer *n* using **different odd numbers** (ordering is ignored), equals to the partition number of *n* being partitioned into the self-conjugated Ferrers Diagrams. (1st row exchanged with 1st column, 2nd row exchanged with 2nd column, …, as image is rotated by the dotted line as axis shown in slices; is still Ferrers diagram. 2 Ferrers diagrams are known as a pair of conjugated Ferrers diagram. If both the conjugated Ferrers Diagram and it original diagram are the same, the diagram is called self-conjugated.)