Spring 2022, Math 579: Preliminary Problem Set 9
Due: Thursday, March 17th, 2022
Generating Functions for Combinatorics

Preliminary problems. These problems should be completed before discussion on Thursday.

(P1) Fill in the first 3 entries in the following table, based on the notes from Tuesday's lecture, to give a combinatorial interpretation of the value of c_n in terms of a_n and b_n. The words "A-structure" and "B-structure" should appear in each.

Based on your entries in those boxes, conjecture an answer for the box in lower right corner.

	Ordinary Generating Functions $$A(z) = \sum_{n=0}^{\infty} a_n z^n, \ B(z) = \sum_{n=0}^{\infty} b_n z^n,$$ $$C(z) = \sum_{n=0}^{\infty} c_n z^n$$	Exponential Generating Functions $$A(z) = \sum_{n=0}^{\infty} \frac{a_n}{n!} z^n, \ B(z) = \sum_{n=0}^{\infty} \frac{b_n}{n!} z^n,$$ $$C(z) = \sum_{n=0}^{\infty} \frac{c_n}{n!} z^n$$
$C(z) = A(z)B(z)$	$c_n = \#$ ways to	$c_n = \#$ ways to
$C(z) = A(B(z))$	$c_n = \#$ ways to	$c_n = \#$ ways to