12.1 Permutations and Combinations

Permutations: ${}^{n}P_{m}$

Combinations: ${}^{n}C_{m}$

Whole numbers: n, m

1251. Factorial

$n! = 1 \cdot 2 \cdot 3 \ldots (n-2)(n-1)n$

$0! = 1$

1252. ${}^{n}P_{n} = n!$

1253. ${}^{n}P_{m} = \dfrac{n!}{(n-m)!}$

1254. Binomial Coefficient

${}^{n}C_{m} = \binom{n}{m} = \dfrac{n!}{m!(n-m)!}$

1255. ${}^{n}C_{m} = {}^{n}C_{n-m}$

1256. ${}^{n}C_{m} + {}^{n}C_{m+1} = {}^{n+1}C_{m+1}$

1257. ${}^{n}C_{0} + {}^{n}C_{1} + {}^{n}C_{2} + \ldots + {}^{n}C_{n} = 2^{n}$

1258. Pascal's Triangle

Row 0						1						
Row 1					1		1					
Row 2				1		2		1				
Row 3			1		3		3		1			
Row 4		1		4		6		4		1		
Row 5	1		5		10		10		5		1	
Row 6	1	6		15		20		15		6		1