

$$\left( \sum_{i \geq 0} a_i x^i \right) \left( \sum_{j \geq 0} b_j x^j \right) = \sum_{n \geq 0} c_n x^n$$

$$c_n = \sum_{i+j=n} a_i b_j$$

$\binom{4}{2} = 6$  *ways*  
 $\binom{6}{3} = 20$  *ways*  
 4 im System  $\Rightarrow 16$

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$$B(x) = x(B(x))^2 + 1$$

$b_1 = b_0 b_0 = 1$   
 $b_2 = b_0 b_1 + b_1 b_0 = 2$   
 $b_3 = b_0 b_2 + b_1 b_1 + b_2 b_0 = 5$

$$B(x) = \sum_{n \geq 0} b_n x^n \quad b_0 = B(0)$$

$$x \cdot y^2 - y + 1 = 0$$

$$\frac{1 \pm \sqrt{1-4x}}{2x}$$

$$\lim_{x \rightarrow 0^+} \frac{1 - \sqrt{1-4x}}{2x} = 1$$

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$$\frac{(1/2) \cdot (3/2) \cdot \dots \cdot ((2n-1)/2)}{n!} = \frac{1}{2^n} \binom{-1/2}{n} (-4x)^n$$

$$\frac{1}{2^n} \binom{-1/2}{n} (-4x)^{2n-1} = \frac{(-4)^n \binom{-1/2}{n}}{2^n} = \binom{2n}{n} (-1)^n$$

$$\frac{1}{4^{n+1}} \binom{-1/2}{n+1} (-4x)^{n+1} = \frac{(-1)^{n+1} \binom{-1/2}{n+1}}{4^{n+1}} = \frac{(-1)^{n+1} \frac{(2n+1)!}{(n+1)! 2^{2n+1}}}{4^{n+1}}$$

$$-\frac{1}{2} - n + 1 = \frac{1-2n}{2}$$

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$$b_n = b_0 b_{n-1} + \dots + b_{n-1} b_0$$

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$(a_0, a_1, \dots) \sim a_0 + a_1 x + \frac{1}{2} a_2 x^2 + \frac{1}{3!} a_3 x^3 + \dots$

$$\left( \sum a_i x^i \right) \left( \sum b_j x^j \right) = \sum \left( \sum_{i+j=n} a_i b_j \right) x^n$$

$$\left( \sum_{i \geq 0} \frac{a_i x^i}{i!} \right) \left( \sum_{j \geq 0} \frac{b_j x^j}{j!} \right) = \sum_{n \geq 0} \left( \sum_{i+j=n} \binom{n}{i} a_i b_j \right) \frac{x^n}{n!}$$

$$\left( \frac{a_n x^n}{n!} \right)' = \frac{a_n x^{n-1}}{(n-1)!} \int \frac{a_n x^n}{n!} = \frac{a_n x^{n-1}}{(n-1)!}$$

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$$\binom{m-1}{\xi_1} \binom{m-\xi_1-1}{\xi_2} \dots \binom{m-\dots-1}{\xi_m}$$

$$\frac{(m-1)! (m-\xi_1-1)!}{\xi_1! (m-\xi_1)! \xi_2! \dots}$$

$m=12$   
 $\xi_1=1$   
 $\xi_2=3$   
 $\xi_3=4$   
 $\xi_4=3$

$m=1 : \xi_1=3 \quad 3 \cdot 6^3$   
 $m=2 : \xi_1=1 \ \xi_2=2 \quad 3 \cdot 2 \cdot 7 \cdot \frac{1}{7} \cdot 6^2$   
 $m=2 : \xi_1=2 \ \xi_2=1$   
 $m=3 : \xi_1=1 \ \xi_2=3 \quad \frac{1}{3!} \cdot \frac{3!}{1} \cdot 6^3$

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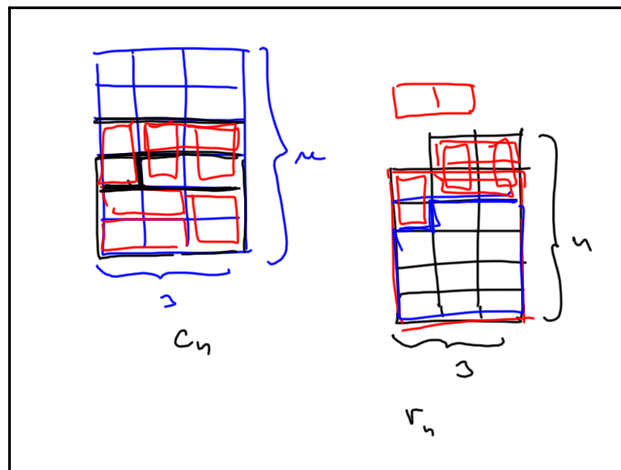
$$\mu_n = n! t_n$$

$$\mu_n \sim \sum_{k=0}^n \mu_k \frac{x^k}{k!} \quad \text{exp. v. f.}$$

$n=4: \quad n^{n-2} = 16$   
 $n=5: \quad n^{n-2} = 5^3 = 125$   
 $n=6: \quad n^{n-2} = 6^4$

$$X = \frac{A(x)}{R A(x)}$$

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$$C_n = 2r_{n-1} + r_{n-2}$$

$$r_n = C_{n-1} + r_{n-2}$$

$C_0 = 1$   
 $C_1 = 0$   
 $r_0 = 0$   
 $r_1 = 1$

n	0	1	2	...
C <sub>n</sub>	1	0	3	...
r <sub>n</sub>	0	1	0	...

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