Algebra

Monday, September 6, 2021 7:58 PM

Kombinatorika

$n! = 1 \cdot 2 \cdot 3 \cdot 4 \cdot \ldots \cdot n \quad (n \geq 2)$

$1! = 1$

$0! = 1$

$\frac{(n+2)!}{\cancel{(n+1)!}} = n+2$

Permutaciok

A = {1, 2, 3}

$\boxed{P_n = n!}$

számít a sorrend

Variaciok

$A = \{1, 2, 3, 4\}$

$V_4^3 = 24$ számít a sorrend

$\boxed{V_n^k = n(n-1)(n-2)\ldots(n-k+1)}$

$\boxed{V_n^k = \frac{n!}{(n-k)!}}$

Kombinaciok

$A = \{1, 2, 3, 4\}$

$C_4^3 = \frac{V_4^3}{P_3} = 4$

$\boxed{C_n^k = \frac{V_n^k}{P_k}}$

$\boxed{C_n^k = \frac{n!}{k!(n-k)!}}$

nem számít a sorrend

$\boxed{C_n^k = C_n^{n-k}}$

$C_n^0 = 1 = C_n^n$

$C_n^1 = n = C_n^{n-1}$

$C_n^2 = \frac{n(n-1)}{2} = C_n^{n-2}$

$C_n^0 + C_n^1 + C_n^2 + \ldots + C_n^n = 2^n$

$C_n^1 + C_n^3 + C_n^5 + \ldots = 2^{n-1}$

Pascal azonossag, Pascal haromszog

$\boxed{C_n^k = C_{n-1}^k + C_{n-1}^{k-1}}$

1

1 1

1 2 1

$$\boxed{C_n^k = C_{n-1}^{k-1} + C_{n-1}^{k}}$$

$(a+b)^0 = 1$

$(a+b)^1 = 1a+1b$

$(a+b)^2 = a^2+2ab+b^2$

$(a+b)^3 = a^3+3a^2b+3ab^2+b^3$

$(a+b)^4 = a^4+4a^3b+6a^2b^2+4ab^3+b^4$

1 2 1

1 3 3 1

1 4 6 4 1

1 5 10 10 5 1

Newton binominalis keplete

$$\boxed{(a+b)^n = a^n + C_n^1 a^{n-1}\cdot b + C_n^2 a^{n-2} b^2 + \dots + C_n^k a^{n-k} b^k + \dots + C_n^{n-1} a b^{n-1} + b^n}$$

$$\boxed{T_{k+1} = C_n^k \cdot a^{n-k} \cdot b^k}$$ – binom határány