

Factorial of a number

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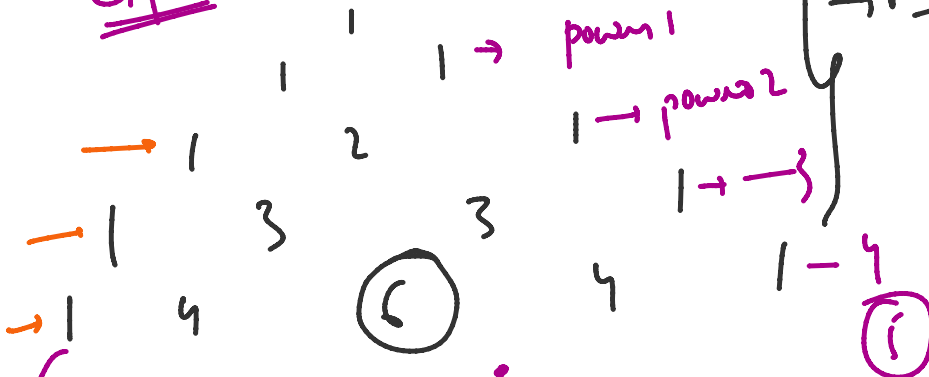
$$5! = 5 \times 4 \times 3 \times 2 \times 1$$

$$\underline{4! = 4 \times 3 \times 2 \times 1}$$

nCr → binomial coefficient

$$(x+y)^n$$

expansion of



→ Pascal's triangle

$$(x+y)^1 = x+y$$

$$(x+y)^2 = x^2 + 2xy + y^2$$

$$(x+y)^3 = x^3 + \underline{3x^2y} + \underline{3xy^2} + y^3$$

Pascal's triangle represent the coefficients of rising powers of x & rising powers of y .

$$\left[\begin{array}{c} \xrightarrow{\text{dec power of } x} \\ x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4 \\ \xleftarrow{\text{inc power of } x} \end{array} \right] \quad \begin{array}{c} \xleftarrow{\text{inc power of } y} \\ \xrightarrow{\text{dec power of } y} \end{array}$$

power (C) term

$$nCr = \frac{n!}{r!(n-r)!}$$

$${}^4C_2 = \frac{4!}{2!(4-2)!}$$

$$= \frac{4 \times 3 \times 2 \times 1}{2 \times 1 \times 2 \times 1} = \underline{\underline{6}}$$

$$nCr = \frac{n!}{r!(n-r)!}$$

⑦