

Heoolo world!

- The first item
- The second etc

Binomial formula: There are $\binom{2n+1}{n}$ with $1/(2n+1)$ of these have all partial sums positive

Greek letters: Alpha symbol is α Beta symbol is β Gamma symbol is γ

Lambda symbol is λ Delta symbol is δ

Epsilon symbol is ϵ

Powers and indices: $k_{n+1} = n^2 + k_n^2 - k_{n-1}$

n^{221}

n^{p+1}

p_{k+1}

Fractions: $\frac{n!}{k!(n-k)!} = \binom{n}{k}$

Square root of a fraction:

$\sqrt[4]{\frac{a}{b}}$

Nth root of something $\sqrt[n]{1 + x + x^2 + x^3 + \dots + x^n}$

$\sum_{i=1}^{i=10} t_i$

Factorial formula:

$n! = 1.2.3....n = \prod_{k=1}^n k,$

integers $n \geq 0$.

Matrices:

$A_{m,n} = \begin{pmatrix} a_{1,1} & a_{1,2} \\ a_{2,1} & a_{2,2} \end{pmatrix}$

$B_{m,n} = \begin{bmatrix} b_{11} & b_{12} \\ b_{21} & b_{22} \end{bmatrix}$

Set and logic symbols in latex:

Set notation is $\{x, y, z\}$

Empty set is \emptyset or \varnothing

Set intersection is \cap

Set union is \cup

Set difference is \setminus

Cartesian product is \times

Set membership given by \in

Universal Quantifier is \forall

Existential Quantifier is \exists

Cardinality of a set is $|S|$

Subset is \subseteq

Proper subset is \subset

SuperSet is \supseteq

Proper superset is \supset

Negation of anything is start with not \notin

Mapping from A to B is $f : A \rightarrow B$

If f is injective, it is $f : A \mapsto B$

If f is surjective, it is $f : A \twoheadrightarrow B$

if f is a bijection it is $f : A \leftrightarrow B$

Falling powers of factorial is $x^{\overline{n}}$

Formula for exponent of a prime p in $(n!)$'s unique factorization:

$$\epsilon_p(n!) = \left\lfloor \frac{n}{p} \right\rfloor + \left\lfloor \frac{n}{p^2} \right\rfloor + \left\lfloor \frac{n}{p^3} \right\rfloor + \dots = \sum_{k \geq 1} \left\lfloor \frac{n}{p^k} \right\rfloor$$

Falling powers of factorial is $x^{\overline{n}}$

$$x^{\overline{n}} = \overbrace{x(x-1) \dots (x-n+1)}^{n \text{ factors}}$$