Sets

$\mathbf{N}$ The Natural Numbers, $1, 2, 3, 4, 5, 6, \ldots$
$\mathbf{Z}$ The Integers $0, \pm 1, \pm 2, \pm 3, \ldots$
$\mathbf{Q}$ The rational numbers $p/q \ni p, q \in \mathbf{Z}, q \neq 0$
$\mathbf{R}$ The real numbers
$\mathbf{C}$ The complex numbers
$\emptyset$ The empty set
$\subseteq$ "is a subset of"
$\subset$ "is a proper subset of"
A^C The complement of A
$\cup$ "the union of"
$\cap$ "the intersection of"
$A \setminus B$ The elements of A that are not in B

Logical operatiors

$\forall$ "for all"
$\exists$ "there exists"
$\exists!$ "there exists a unique"
$\ni$ "such that"
$\wedge$ "and"
$\vee$ "or"
For example: $\forall a \in \mathbf{R}, \exists! b \in \mathbf{R} \ni (b \geq 0 \wedge |a| = b)$
$\neg$ "not"
$\Rightarrow$ "implies" (if... then...)
$\Longleftrightarrow$ "if and only if"
$\therefore$ "therefore"

Other symbols

$\rightarrow$ maps to
$\twoheadrightarrow$ "maps onto"
$\rightarrowtail$ "maps into"
$\rightarrowtail\!\!\!\!\!\!\leftarrow$ "contradiction"