# Mathematical shorthand

| | |
|---|---|
| $\Rightarrow$ | implies |
| $\Leftarrow$ | is implied by |
| $\Leftrightarrow$ | if and only if |
| iff | if and only if |
| $\exists$ | there exists |
| $\exists!$ | there exists a unique |
| $\forall$ | for all |
| s.t. | such that |
| w.l.o.g. | without loss of generality |
| w.m.a. | we may assume |
| $x \in S$ | $x$ is an element of the set $S$ |
| $x \notin S$ | $x$ is not an element of the set $S$ |
| $S \subseteq T$ | $S$ is a subset of the set $T$ |
| $S \nsubseteq T$ | $S$ is not a subset of the set $T$ |
| $S \cup T$ | the union of the sets $S$ and $T$ |
| $S \cap T$ | the intersection of the sets $S$ and $T$ |
| $f : S \to T$ | $f$ is a function from the set $S$ to the set $T$ |
| $\{x \in S \mid P(x)\}$ | the set of all $x \in S$ which have the property $P(x)$ |
| $\mathbb{N}$ | the natural numbers $1, 2, 3, \ldots$ |
| $\mathbb{Z}$ | the integers $0, \pm 1, \pm 2, \ldots$ |
| $\mathbb{Q}$ | the rational numbers $\{\frac{a}{b} \mid \forall a \in \mathbb{Z}, b \in N\}$. |
| $\mathbb{R}$ | the real numbers |