Symbols!

The Greek Alphabet

Upper case	Lower case	Name	English equivalent
A	α	alpha	a
B	β	beta	b
Γ	γ	gamma	g
Δ	δ	delta	d
E	ϵ, ε	epsilon	e
Z	ζ	zeta	z
H	η	eta	ee
Θ	θ, ϑ	theta	th
I	ι	iota	i
K	κ	kappa	k
Λ	λ	lambda	l
M	μ	mu	m
N	ν	nu	n
Ξ	ξ	xi	x
O	o	omicron	o
Π	π	pi	p
P	ρ	rho	r
Σ	σ, ς	sigma	s
T	τ	tau	t
Υ	υ	upsilon	u (or y)
Φ	ϕ, φ	phi	ph
X	χ	chi	ch (as in ‘loch’)
Ψ	ψ	psi	ps
Ω	ω	omega	(long) o

Some logic symbols

Symbol	Meaning	Usage
$\neg$, $\sim$	not	$\neg P$: it isn't the case that P
$\wedge$, &	and	$(P \wedge Q)$: P and Q
$\vee$	(inclusive) or	$(P \vee Q)$: P or Q or both
$\rightarrow$	if	$(P \rightarrow Q)$: if P then Q
$\supset$	if	$(P \supset Q)$: if P then Q
	'material conditional'	where this is (contentiously) equated to $(\neg P \vee Q)$
$\leftrightarrow$, $\equiv$	if and only if	$(P \leftrightarrow Q)$: P if and only if Q
		'if and only if' is often abbreviated 'iff'
$P, Q, R, \ldots$	propositions	stand in for whole assertions
$a, b, c, \ldots$	names	standing in e.g. for 'Juliet', 'Romeo', 'Mercutio' etc.
		NB use lower case letters not too late in alphabet as names
$F, G, L, \ldots$	predicates	standing in e.g. for 'is a girl', 'is tall', 'loves' etc.
		NB use upper case letters in middle of alphabet as predicates
Fa, Gb, Lab	simple sentences	So 'Fa' might mean that Juliet is a girl, 'Gb' that Romeo is tall,
		'Lab' that Juliet loves Romeo. NB predicate comes first!
$x, y, z, \ldots$	variables	used for expressing generalizations, as in ...
$\forall$	for all	$\forall x Fx$: every thing x is such that x is F
$\exists$	there is / some	$\exists x Fx$: there is a thing x such that x is F
		or : something is such that it is F
$=$	is identical to	$\alpha = \beta$: α is one and the same thing as β
$\neq$	is not identical to	$\alpha \neq \beta$: α is a different thing from β
$\Box$	necessarily	$\Box P$: it is necessarily true that P
$\Diamond$	possibly	$\Diamond P$: it is possibly true that P
$\Box\!\!\rightarrow$	(subjunctive) if	$(P \Box\!\!\rightarrow Q)$: if P were the case, Q would be true too
$\vdash$	proves	$A, B \vdash C$: there's a proof from premisses A, B to conclusion C
$\vDash$	logically entails	$A, B \vDash C$: the premisses A, B logically entail conclusion C
		(contrast proof in some formal system vs entailment)
$\nvdash$	doesn't prove	$A, B \nvdash C$: there's no proof from premisses A, B to conclusion C
$\nvDash$	doesn't entail	$A, B \nvDash C$: the premisses A, B don't entail conclusion C
$\in$	is member of	$\alpha \in \Gamma$: α is a member of the set Γ
$\notin$	isn't member of	$\alpha \notin \Gamma$: α is not a member of the set Γ
$\subseteq$	is a subset of	$\Delta \subseteq \Gamma$: Δ is a subset of Γ
		i.e. every member of Δ is a member of Γ
$\subset$	is a (proper) subset of	$\Delta \subset \Gamma$: Δ is subset of Γ, and $\Delta \neq \Gamma$
		(sometimes $\subset$ is used just like $\subseteq$)
$\{\ldots\}$	set	$\{2, 3, 5\}$: the set whose members are 2, 3, 5
$\{\ldots \mid \ldots\}$	set	$\{x \mid x \text{ is even}\}$: the set of x that x is even
$\langle\ ,\ \rangle$	ordered pair	$\langle \alpha, \beta \rangle$: the ordered pair whose first member
		is α and whose second member is β