Greek characters

Name	Symbol	Typical use(s)
alpha	α	angle, constant
beta	β	angle, constant
gamma	γ	angle, constant
delta	δ	limit definition
epsilon	ϵ or ε	limit definition
theta	θ or ϑ	angle
pi	π or ϖ	circular constant
phi	ϕ or φ	angle, constant

Named sets

empty set	$\varnothing$
real numbers	$\mathbf{R}$
ordered pairs	$\mathbf{R}^2$

integers	$\mathbf{Z}$
positive integers	$\mathbf{Z}_{>0}$
positive reals	$\mathbf{R}_{>0}$

Set symbols

Meaning	Symbol
is a member	$\in$
subset	$\subset$
intersection	$\cap$

Meaning	Symbol
union	$\cup$
complement	superscript^{C}
set minus	$\setminus$

Logic symbols

Meaning	Symbol
negation	$\neg$
and	$\wedge$
or	$\vee$
implies	$\implies$

Meaning	Symbol
equivalent	$\equiv$
iff	$\iff$
for all	$\forall$
there exists	$\exists$

Arithmetic properties

$(\forall a, b \in \mathbf{R})(a + b = b + a)$ commutivity

$(\forall a, b, c \in \mathbf{R})(a + (b + c) = (a + b) + c)$ commutivity

$(\forall a, b \in \mathbf{R})(ab = ba)$ commutivity

$(\forall a, b, c \in \mathbf{R})(a(bc) = (ab)c)$ commutivity

$(\forall a, b, c \in \mathbf{R})(a(b + c) = ab + ac)$ distrutity

Exponents

For $a, b > 0$ and m, n real:

$$a^0 = 1, \qquad 0^a = 0$$

$$1^a = 1, \qquad a^n a^m = a^{n+m}$$

$$a^n/a^m = a^{n-m}, \qquad (a^n)^m = a^{n \cdot m}$$

$$a^{-m} = 1/a^m, \qquad (a/b)^m = a^m/b^m$$

Solution of Equations

Algebraic

$$[ab = 0] \equiv [a = 0 \textbf{ or } b = 0]$$

$$[a^2 = b^2] \equiv [a = b \textbf{ or } a = -b]$$

$$\left[\frac{a}{b} = 0\right] \equiv [a = 0 \textbf{ and } b \neq 0]$$

$$\left[\frac{a}{b} = \frac{c}{d}\right] \equiv [ad = bc \textbf{ and } b \neq 0 \textbf{ and } d \neq 0]$$

$$[|a| = |b|] \equiv [a = b \textbf{ or } a = -b]$$

$$[\sqrt{a} = b] \equiv [a = b^2 \textbf{ and } b \geq 0]$$

For $a \neq 0$,

$$[ax^2 + bx + c = 0] \equiv \left[x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}\right]$$

Function notation

$\mathrm{dom}(F)$	domain of function F
$\mathrm{range}(F)$	range of function F