SCIO Mathematics in English Notation Guide

Decimal numbers are written using the decimal point, for example 0.5 means zero point five.

Large numbers are written using the comma as the thousands separator, for example 1,000 means one thousand.

Symbols and operations

$=$	is equal to
$\neq$	is not equal to
$\approx$	is approximately equal to
$<$	is less than
$\leq$	is less than or equal to
$>$	is greater than
$\geq$	is greater than or equal to
∞	infinity
$\Rightarrow$	implies
$\Leftarrow$	is implied by
$\Leftrightarrow$	implies and is implied by (is equivalent to)
$a + b$	a plus b
$a - b$	a minus b
$a \cdot b$, $a \times b$, ab	a multiplied by b
$a : b$, a / b, $\frac{a}{b}$	a divided by b
$\sum_{i=1}^{n} a_i$	$a_1 + a_2 + \ldots + a_n$
$\sqrt{a}$	the non-negative square root of a, for $a \in \mathbb{R}$, $a \geq 0$
$\sqrt[n]{a}$	the (real) nth root of a, for $a \in \mathbb{R}$, where $\sqrt[n]{a} \geq 0$ for $a \geq 0$
$\lvert a \rvert$	the modulus of a
$n!$	n factorial
$\binom{n}{r}$	the binomial coefficient $\frac{n!}{r!(n-r)!}$ for $n, r \in \mathbb{Z}$ and $0 \leq r \leq n$

Set symbols

$\in$	is an element of
$\notin$	is not an element of
$\{x_1, x_2, \ldots\}$	the set with elements $x_1, x_2, \ldots$
$\{x : \ldots\}$	the set of all x such that …
$\emptyset$	the empty set
A'	the complement of the set A
$\mathbb{N}$	the set of natural numbers, $\{1, 2, 3, \ldots\}$
$\mathbb{Z}$	the set of integers, $\{0, \pm1, \pm2, \pm3, \ldots\}$
$\mathbb{Q}$	the set of rational numbers, $\left\{\frac{p}{q} : p,\ q \in \mathbb{Z},\ q \neq 0\right\}$
$\mathbb{R}$	the set of real numbers
(x, y)	the ordered pair x, y
$\subseteq$	is a subset of
$\subset$	is a proper subset of
$\cup$	union
$\cap$	intersection
$[a, b]$	the closed interval $\{x \in \mathbb{R} : a \leq x \leq b\}$
$[a, b)$	the interval $\{x \in \mathbb{R} : a \leq x < b\}$
$(a, b]$	the interval $\{x \in \mathbb{R} : a < x \leq b\}$
(a, b)	the open interval $\{x \in \mathbb{R} : a < x < b\}$

Functions

$f(x)$	the value of the function f at x
$f : A \to B$	f is a function under which each element of set A has an image in set B
$f : x \mapsto y$	the function f maps the element x to the element y
f^{-1}	the inverse function of the one-one function f
$\lim_{x \to a} f(x)$	the limit of $f(x)$ as x tends to a
Δx, δx	an increment of x
e	base of natural logarithms
e^x, $\exp(x)$	exponential function of x
$\log_a x$	logarithm to the base a of x
$\ln x$	natural logarithm of x
$\lg x$, $\log_{10} x$	logarithm of x to base 10
sin, cos, tan, cot	the circular functions
$\sin^{-1}$, $\cos^{-1}$, $\tan^{-1}$, $\cot^{-1}$	the inverse circular functions

Vectors

$\mathbf{a}$	the vector $\mathbf{a}$
$\overrightarrow{AB}$	the vector represented in magnitude and direction by the directed line segment AB
$\lvert \mathbf{a} \rvert$	the magnitude of $\mathbf{a}$
$\lvert \overrightarrow{AB} \rvert$	the magnitude of AB
$\mathbf{a}.\mathbf{b}$	the scalar product of $\mathbf{a}$ and $\mathbf{b}$
$\mathbf{a} \times \mathbf{b}$	the vector product of $\mathbf{a}$ and $\mathbf{b}$

Probability and statistics

$A, B, C, \ldots$	events
$A \cup B$	union of the events A and B
$A \cap B$	intersection of the events A and B
$P(A)$	probability of the event A
A'	complement of the event A
${}^nC_r$	the number of combinations of r objects from n, ${}^nC_r = \binom{n}{r} = \frac{n!}{r!(n-r)!}$
${}^nP_r$	the number of permutations of r objects from n, ${}^nP_r = \frac{n!}{(n-r)!}$