

Mathematical Notations

Conditionals and Operators

$r / ; c$: Relation r holds under the condition c .

$a = b$: The expression a is mathematically identical to b .

$a \neq b$: The expression a is mathematically different from b .

$x > y$: The quantity x is greater than quantity y .

$x \geq y$: The quantity x is greater than or equal to the quantity y .

$x < y$: The quantity x is less than quantity y .

$x \leq y$: The quantity x is less than or equal to quantity y .

$P := Q$: Statement P defines statement Q .

$a \wedge b$: a and b .

$a \vee b$: a or b .

$\forall a$: for all a .

\exists : [there] exists.

\iff : If and only if.

Sets & Domains

$\{a_1, a_2, \dots, a_n\}$: A finite set with some elements

a_1, a_2, \dots, a_n .

$\{a_1, a_2, \dots, a_n \dots\}$: An infinite set with elements

a_1, a_2, \dots

$\{\text{listElement} / ; \text{domainSpecification}\}$: A sequence of elements `listElement` with some `domainSpecifications` in

the set. For example, $\{x : x = \frac{p}{q}; p \in \mathbb{Z}, q \in \mathbb{N}^+\}$ $a \in A$
: a is an element of the set A .

$a \notin A$: a is not an element of the set A .

$x \in (a, b)$: The number x lies within the specified interval (a, b) .

$x \notin (a, b)$: The number x does not belong to the specified interval (a, b) . **Standard Set Notations**

\mathbb{N} : the set of natural numbers $\{0, 1, 2, \dots\}$

\mathbb{N}^+ : The set of positive natural numbers: $\{1, 2, 3, \dots\}$

\mathbb{Z} : The set of integers $\{0, \pm 1, \pm 2, \dots\}$

\mathbb{Q} : The set of rational numbers

\mathbb{R} : The set of real numbers

\mathbb{C} : The set of complex numbers

\mathbb{P} : The set of prime numbers.

$\{\}$: The empty set.

$\{A \otimes B\}$: The ordered set of sets A and B .

$n!$: Factorial of n : $n! = 1 \cdot 2 \cdot 3 \dots (n - 1)n$; $n \in \mathbb{N}$
