List of Symbols

Logic

$p \vee q$	p or q; page 34	$P \equiv Q$	P and Q are logically equivalent; page 45
$p \wedge q$	p and q; page 34	$\forall$	for all; page 58
$\neg p$	not p; page 37	$\exists$	there exists; page 60
$p \rightarrow q$	if p, then q; pages 40–41	$\therefore$	therefore; page 51
$p \leftrightarrow q$	p if and only if q; pages 44–45		

Set Notation

$\{x_1, \ldots, x_n\}$	set consisting of the elements $x_1, \ldots, x_n$; page 22
$\{x \mid p(x)\}$	set consisting of those elements x satisfying property $p(x)$; page 22
$\mathrm{Z}, \mathrm{Z}^-, \mathrm{Z}^+, \mathrm{Z}^{nonneg}$	sets of integers, negative integers, positive integers, nonnegative integers; pages 22–23
$\mathrm{Q}, \mathrm{Q}^-, \mathrm{Q}^+, \mathrm{Q}^{nonneg}$	sets of rational numbers, negative rational numbers, positive rational numbers, nonnegative rational numbers; pages 22–23
$\mathrm{R}, \mathrm{R}^-, \mathrm{R}^+, \mathrm{R}^{nonneg}$	sets of real numbers, negative real numbers, positive real numbers, nonnegative real numbers; pages 22–23
$x \in X$	x is an element of X; page 23
$x \notin X$	x is not an element of X; page 23
$X = Y$	set equality (X and Y have the same elements); page 23
$\lvert X \rvert$	cardinality of X (number of elements in X); page 23
$\varnothing$	empty set; page 23
$X \subseteq Y$	X is a subset of Y; page 24
$X \subset Y$	X is a proper subset of Y; page 25
$\mathcal{P}(X)$	power set of X (all subsets of X); page 25
$X \cup Y$	X union Y (all elements in X or Y); page 25
$\bigcup_{i=1}^{n} X_i$	union of $X_1, \ldots, X_n$ (all elements that belong to at least one of $X_1, X_2, \ldots, X_n$); page 29
$\bigcup_{i=1}^{\infty} X_i$	union of $X_1, X_2, \ldots$ (all elements that belong to at least one of $X_1, X_2, \ldots$); page 29
$\cup\mathcal{S}$	union of $\mathcal{S}$ (all elements that belong to at least one set in $\mathcal{S}$); page 28
$X \cap Y$	X intersect Y (all elements in X and Y); pages 25–26
$\bigcap_{i=1}^{n} X_i$	intersection of $X_1, \ldots, X_n$ (all elements that belong to every one of $X_1, X_2, \ldots, X_n$); page 29
$\bigcap_{i=1}^{\infty} X_i$	intersection of $X_1, X_2, \ldots$ (all elements that belong to every one of $X_1, X_2, \ldots$); page 29
$\cap\mathcal{S}$	intersection of $\mathcal{S}$ (all elements that belong to every set in $\mathcal{S}$); page 29
$X - Y$	set difference (all elements in X but not in Y); page 26
$\overline{X}$	complement of X (all elements not in X); page 26
(x, y)	ordered pair; page 29
$(x_1, \ldots, x_n)$	n-tuple; page 30

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$X \times Y$	Cartesian product of X and Y [pairs (x, y) with x in X and y in Y]; page 29
$X_1 \times X_2 \times \cdots \times X_n$	Cartesian product of $X_1, X_2, \ldots, X_n$ (n-tuples with $x_i \in X_i$); page 30
$X \triangle Y$	symmetric difference of X and Y; page 33

RELATIONS

xRy	(x, y) is in R (x is related to y by the relation R); page 161
$[x]$	equivalence class containing x; page 173
R^{-1}	inverse relation [all (y, x) with (x, y) in R]; page 167
$R_2 \circ R_1$	composition of relations; page 167
$x \preceq y$	xRy; page 166

FUNCTIONS

$f(x)$	value assigned to x; page 134
$f: X \to Y$	function from X to Y; page 133
$f \circ g$	composition of f and g; page 142
f^{-1}	inverse function [all (y, x) with (x, y) in f]; pages 141
$f(n) = O(g(n))$	$\lvert f(n)\rvert \le C\lvert g(n)\rvert$ for n sufficiently large; page 206
$f(n) = \Omega(g(n))$	$c\lvert g(n)\rvert \le \lvert f(n)\rvert$ for n sufficiently large; page 206
$f(n) = \Theta(g(n))$	$c\lvert g(n)\rvert \le \lvert f(n)\rvert \le C\lvert g(n)\rvert$ for n sufficiently large; page 206

COUNTING

$C(n, r)$	number of r-combinations of an n-element set $(n!/[(n-r)!r!])$; page 293
$P(n, r)$	number of r-permutations of an n-element set $[n(n-1)\cdots(n-r+1)]$; page 291

GRAPHS

$G = (V, E)$	graph G with vertex set V and edge set E; page 395
(v, w)	edge; page 395
$\delta(v)$	degree of vertex v; page 408
$(v_1, \ldots, v_n)$	path from v_1 to v_n; page 404–405
$(v_1, \ldots, v_n), v_1 = v_n$	cycle; page 407
K_n	complete graph on n vertices; page 400
$K_{m,n}$	complete bipartite graph on m and n vertices; page 401
$w(i, j)$	weight of edge (i, j); page 425
F_{ij}	flow in edge (i, j); page 527
C_{ij}	capacity of edge (i, j); page 527
$(P, \overline{P})$	cut in a network; page 540

PROBABILITY

$P(x)$	probability of outcome x; page 321
$P(E)$	probability of event E; page 322
$P(E \mid F)$	conditional probability of E given F $[P(E \cap F)/P(F)]$; page 326

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