

## SYMBOL GUIDE

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The following are miscellaneous symbols that we may use in class. Here they are for reference.

Symbol	Meaning
$\mathbb{R}$	The set of real numbers
$\mathbb{Q}$	The set of rational numbers (fractions)
$\mathbb{Z}$	The set of integers (positive and negative whole numbers, and 0)
$\mathbb{N}$	The set of natural numbers (1, 2, 3, ...)

TABLE 1. Number Sets

$\infty$	“infinity”
$x!$	“x factorial” $((x)(x-1)(x-2)\cdots(2)(1))$

TABLE 2. Misc

$\in$	“is an element of”
$\subseteq$	“is a subset of”
$\subset$	“is a strict subset of”
$\cup$	“union” $(S \cup T = \{x \mid x \in S \text{ or } x \in T\})$
$\cap$	“intersection” $(S \cap T = \{x \mid x \in S \text{ and } x \in T\})$

TABLE 3. Set Manipulation

$\exists$	“there exists”
$\forall$	“for all” (or “for every”)

TABLE 4. Quantifiers

$ f(x) $	“Absolute value $f(x)$ ” ( $f(x)$ if $f(x) \geq 0$ , $-f(x)$ if $f(x) < 0$ ).
$\lfloor f(x) \rfloor$	“Floor $f(x)$ ” (the greatest integer $\leq f(x)$ ).
$\lceil f(x) \rceil$	“Ceiling $f(x)$ ” (the least integer $\geq f(x)$ ).

TABLE 5. Function

$\Rightarrow$	“implies” ( $a \Rightarrow b$ : “if $a$ , then $b$ ”)
$\therefore$	“therefore”
<i>Q.E.D.</i>	“Quad Erat Demonstrandum (sp?)” (That which needed to be shown has been shown, the proof is complete)
$\rightsquigarrow$	“leads to”
$\Leftrightarrow$	“if and only if” (also “iff”)

TABLE 6. Proof Symbols

$(a, b)$	The set of numbers between $a$ and $b$ <i>not including</i> $a$ and $b$ ( $\{x \mid a < x < b\}$ )
$[a, b]$	The set of numbers between $a$ and $b$ <i>including</i> $a$ and $b$ ( $\{x \mid a \leq x \leq b\}$ )
$(a, b]$	$\{x \mid a < x \leq b\}$
$[a, b)$	$\{x \mid a \leq x < b\}$

TABLE 7. Interval Notation