SYMBOL GUIDE

JASON GROUT

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

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\mathbb{R}$</td>
<td>The set of real numbers</td>
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<tr>
<td>$\mathbb{Q}$</td>
<td>The set of rational numbers (fractions)</td>
</tr>
<tr>
<td>$\mathbb{Z}$</td>
<td>The set of integers (positive and negative whole numbers, and 0)</td>
</tr>
<tr>
<td>$\mathbb{N}$</td>
<td>The set of natural numbers (1, 2, 3, \ldots)</td>
</tr>
</tbody>
</table>

Table 1. Number Sets

∞ “infinity”

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

Table 2. Misc

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

Table 3. Set Manipulation

∃ “there exists”
∀ “for all” (or “for every”)

Table 4. Quantifiers

Date: Winter 2003.
\[ |f(x)| = \text{“Absolute value } f(x)\text{” (} f(x) \text{ if } f(x) \geq 0, -f(x) \text{ if } f(x) < 0). \]
\[ [f(x)] = \text{“Floor } f(x)\text{” (the greatest integer } \leq f(x)). \]
\[ [f(x)] = \text{“Ceiling } f(x)\text{” (the least integer } \geq f(x)). \]

Table 5. Function

\[ \Rightarrow \text{ “implies” (} a \Rightarrow b \text{: “if } a, \text{ then } b\”) } \]
\[ \therefore \text{ “therefore” } \]

Q.E.D. “Quad Erat Demonstradum (sp?)” (That which needed to be shown has been shown, the proof is complete)

\[ \rightsquigarrow \text{ “leads to” } \]
\[ \iff \text{ “if and only if” (also “iff”) } \]

Table 6. Proof Symbols

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