Math 330 Notes 00A

Notes on the Auxiliary Documents on Sets, Functions and Relations

I use some notation that does not coincide with that used in some or all of the additional reading material I posted in home page and syllabus:

Discrepancies in notation:

"Math 330": the notation used in class
"B/G": the notation in Beck/Geoghean
"Sets 1": the notation in mazur-330-sets-1.pdf
"Sets 2": the notation in mazur-330-sets-2.pdf
"Sets 2": the notation in mazur-330-sets-2.pdf

Note that some of the documents briefly refer to alternate notation.

Math 330	*B/G*	*Sets 1*	*page #*	*Notes*
$\mathbb{N}_0$	$\mathbb{Z}_{\geq 0}$	$\mathbb{N}$	*p.10*	*the set* $\{0, 1, 2, \dots\}$
$\mathbb{N}$	$\mathbb{N}$	$\mathbb{Z}^+$	*p.10*	*the set* $\{1, 2, 3, \dots\}$
A^c *or* $A^{\complement}$	*N/A*	A'	*p.11*	U*: Universal set*
$A \setminus B$	$A - B$	$A - B$	*p.13*	*difference of sets*
$A \cap B$ *or* AB	$A \cap B$	$A \cap B$	*p.13*	AB *is common in probability & statistics*

Math 330	*B/G*	*Sets 2*	*page #*	*Notes*
$A \Delta B$	*N/A*	$A \oplus B$	*p.97*	*symm. difference of sets*
2^A	$P(A)$	$\mathscr{P}(A)$	*p.98*	*power set* $\{B : B \subseteq A$

Some of the documents use more logic than used in class or to be found in B/G:

B/G	*Documents*	*Notes*
Stmt$_1 \Rightarrow$ *Stmt*$_2$	*Stmt*$_1 \to$ *Stmt*$_2$	*Implication: If Stmt*$_1$ *Then Stmt*$_2$
Stmt$_1 \iff$ *Stmt*$_2$	*Stmt*$_1 \leftrightarrow$ *Stmt*$_2$	*Equivalence: Stmt*$_1$ *if and only if Stmt*$_2$
N/A	*Stmt*$_1 \vee$ *Stmt*$_2$	*Disjunction (inclusive Or): Stmt*$_1$ *Or Stmt*$_2$ *or both*
N/A	*Stmt*$_1 \wedge$ *Stmt*$_2$	*Conjunction: Both Stmt*$_1$ *And Stmt*$_2$

Example from the Sets 2 document, p.96: Definition: Two sets A *and* B *are equal* ($A = B$) *if*

$$\forall x \, [x \in A \leftrightarrow x \in B] \quad or, equivalently, \quad \forall x \, [(x \in A \to x \in B) \ \wedge \ (x \in B \to x \in A)]$$

translates to

Definition: Two sets A *and* B *are equal* ($A = B$) *if*

$$x \in A \iff x \in B] \quad or, equivalently, \quad [x \in A \Rightarrow x \in B] \text{ and } [x \in B \Rightarrow x \in A]$$