MAA 4211

Notational and Terminological Differences in Source Materials

Below (starting on the next page) are some differences in terminology and notation that students may encounter when comparing Rosenlicht's textbook, Dr. Groisser's handouts and work in class, and Dr. McCullough's notes. When Rosenlicht has terminology or notation for some object, Dr. Groisser generally tries to adhere to be consistent with Rosenlicht in MAA 4211, but there are a few exceptions.

One general note of explanation: Historically, most math books and articles used boldface notation for the set of real numbers ($\mathbf{R}$), the set of complex numbers ($\mathbf{C}$), etc. But boldface doesn't work on the blackboard (or when taking notes), so people developed the symbols $\mathbb{R}$, $\mathbb{C}$, etc., called "blackboard bold", purely for handwritten use, while keeping the boldface notation in their published materials. In recent decades, "blackboard bold" has taken on a life as its own font in printed materials, rather than just as a substitute for actual boldface. Dr. Groisser's personal preference is the usage he grew up with: $\mathbf{R}$ in printed materials, $\mathbb{R}$ at the blackboard (etc. for several other objects).

Object	Rosenlicht	Groisser	McCullough notes
{natural numbers} (definition)	$\{1, 2, 3, \ldots\}$	$\{1, 2, 3, \ldots\}$	$\{0, 1, 2, 3, \ldots\}$
{natural numbers} (symbol)	no symbol	$\mathbf{N}$ in printed materials, $\mathbb{N}$ on blackboard	$\mathbb{N}$
{integers}	no symbol	$\mathbf{Z}$ in printed materials, $\mathbb{Z}$ on blackboard	$\mathbb{Z}$
{rational numbers}	no symbol	$\mathbf{Q}$ in printed materials, $\mathbb{Q}$ on blackboard	$\mathbb{Q}$
{real numbers}	$\mathbf{R}$	$\mathbf{R}$ in printed materials, $\mathbb{R}$ on blackboard	$\mathbb{R}$
{complex numbers}	$\mathbf{C}$	$\mathbf{C}$ in printed materials, $\mathbb{C}$ on blackboard	$\mathbb{C}$
complement of a subset X (of a specified larger set)	$\mathcal{C}X$ (this is as close as I can come to Rosenlicht's "curly C")	$\mathcal{C}X$	$\tilde{X}$ or $\widetilde{X}$
empty set	circle with a forward-slash through it	same as Rosenlicht on blackboard; $\emptyset$ in printed materials. (Unfortunately, "$\emptyset$" looks very similar to computer scientists' "zero".)	$\emptyset$
set difference (= relative complement) "X minus Y"	$X - Y$	$X \setminus Y$	$X \setminus Y$
range (= image) of function $f : X \to Y$	$f(X)$	$\mathrm{img}(f)$ or $\mathrm{image}(f)$ or $f(X)$	$\mathrm{rg}(f)$

Object	Rosenlicht	Groisser	McCullough notes
certain adjectives for sets		countable	at most countable
certain adjectives for sets		countably infinite	countable
open ball of radius r centered at p (in a metric space)	no specific notation	$B_r(p)$	$N_r(p)$
interior of a set S (in a metric space)	no specific notation	$\mathrm{Int}(S)$ or $\mathring{S}$ or S°	S°
terminology for sequences	sequence of points in a metric space (or set) X	sequence *in* X	sequence *from* X
notation for sequences	$p_1, p_2, p_3, \ldots$	$\{p_n\}_{n=n_0}^{\infty}$ or $\{p_n\}$	$(p_n)_{n=n_0}^{\infty}$ or $(p_n)_n$ or (p_n)
accumulation point of a sequence	no name for this	accumulation point	no name for this
limit point of a subset of a metric space	cluster point	cluster point	limit point