Conventions, notation, terminology etc.

Unless stated otherwise (or even always):

$\mathbb{R}$ .... the real line

All vector (in other words, linear) spaces are over $\mathbb{R}$ and finite dimensional.

$\mathbb{R}^n$ .... $\{(x_1, \dots, x_n) : x_1, \dots, x_n \in \mathbb{R}\}$

Thus, $\mathbb{R}^{m+n} = \mathbb{R}^m \times \mathbb{R}^n$ up to canonical isomorphism.[1]

$A \subset B$ .... $\forall x \, (x \in A \implies x \in B)$

Thus, $(A \subset B) \land (B \subset A) \iff (A = B)$.[2]

$(1, \dots, n)$ or $(x_1, \dots, x_n)$ .... finite sequence

$(1, 2, \dots)$ or $(x_1, x_2, \dots)$ .... infinite sequence

$f : A \to B$ .... $f \subset A \times B$ and $\forall x \in A \; \exists ! \, y \in B \;\; (x, y) \in f$.[3]

Tx .... the same as $T(x)$ when a mapping T is linear.

[Sh:2.2] ...... See also Sect. 2.2 of "Multivariable calculus" by J. Shurman.

[Sh:p.31], or [Sh:Ex.2.2.7] .... The same but page 31, or Exercise 2.2.7

Index of terminology and notation is available at the end of each section.

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[1]'a rule of thumb: there is a canonical isomorphism between X and Y if and only if you would feel comfortable writing "X = Y"' — Reid Barton, see Mathoverflow, What is the definition of "canonical"?

[2]Why "$\subset$" and "$\subsetneqq$" rather than "$\subseteq$" and "$\subset$"? Since I need "$\subset$" several times a day, while "$\subsetneqq$" hardly once a month.

[3]Here B is the codomain, generally not the image of f.