Conventions, notation, terminology etc.

Unless stated otherwise (or even always):
- $R$ is the real line.
- All vector (in other words, linear) spaces are over $R$, and finite-dimensional; in order to avoid confusion, I write $fd$ space.
- $\mathbb{R}^n = \{(x_1, \ldots, x_n) : x_1, \ldots, x_n \in \mathbb{R}\}$

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

A $\subset$ B is the subset relation.

Thus, $(A \subset B) \wedge (B \subset A) \iff (A = B).$ $^2$

(1, \ldots, n) or $(x_1, \ldots, x_n)$ is a finite sequence.

(1, 2, \ldots) or $(x_1, x_2, \ldots)$ is an infinite sequence.

$f : A \to B$ is a function.

$[Sh:2.2]$ 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

---

$^1$ 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 "$\subseteq$" rather than "$\subseteq$" and "$\subset$"? Since I need "$\subset$" several times a day, while "$\subseteq$" hardly once a month.

$^3$ Here $B$ is the codomain, generally not the image of $f$. 