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.
\[ \mathbb{R}^n \] \( \{(x_1, \ldots, x_n) : x_1, \ldots, x_n \in \mathbb{R}\} \)
Thus, \( \mathbb{R}^{m+n} = \mathbb{R}^m \times \mathbb{R}^n \) up to canonical isomorphism.
\[ A \subset B \] \( \forall x \ (x \in A \implies x \in B) \)
Thus, \( (A \subset B) \land (B \subset A) \iff (A = B) \).
\( (1, \ldots, n) \) or \( (x_1, \ldots, x_n) \) finite sequence
\( (1, 2, \ldots) \) or \( (x_1, x_2, \ldots) \) infinite sequence
\[ f : A \to B \] \( f \subset A \times B \) and \( \forall x \in A \exists ! y \in B \ (x, y) \in f \).
\[ Tx \] 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.

---

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 \( f \).