Definition (Metric space)

A *metric space* $\langle \mathbf{A}, d \rangle$ consists of:

1. A set $\mathbf{A}$, elements of which are called *points*;
2. A map $d : \mathbf{A} \times \mathbf{A} \to \mathbb{R}_{\geq 0}$, called *distance*.

The constituents must satisfy:

- $d(a, a) = 0$, for all $a \in \mathbf{A}$;
- If $d(a, b) = 0$, then $a = b$, for all $a, b \in \mathbf{A}$;
- $d(a, b) = d(b, a)$, for all $a, b \in \mathbf{A}$;
- $d(a, b) + d(b, c) \geq d(a, c)$, for all $a, b, c \in \mathbf{A}$.