Definition

Let $\mathcal{R} \subseteq A \times A$ be a relation on A. We say that \mathcal{R} is:

- reflexive if $\forall x \in A, (x, x) \in \mathcal{R}$;
- symmetric if $\forall x, y \in A, (x, y) \in \mathcal{R} \implies (y, x) \in \mathcal{R}$;
- transitive if $\forall x, y, z \in A, [(x, y) \in \mathcal{R} \land (y, z) \in \mathcal{R}] \implies (x, z) \in \mathcal{R}.$

Definition

An equivalence relation is a relation that is reflexive, symmetric, and transitive.

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We often denote an equivalence relation by \sim (LATEX: <code>\sim)</code>