generalization of a pseudometric

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Synonym	semipseudometric space
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Related topic	semimetric
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Defines	semi-pseudometric space
Defines	quasi-pseudometric space
Defines	semi-pseudometric
Defines	quasi-pseudometric

Let X be a set. Let $d : X \times X \to \mathbb{R}$ be a function with the property that $d(x, y) \geq 0$ for all $x, y \in X$. Then d is a

1. *semi-pseudometric* if $d(x, y) = d(y, x)$ for all $x, y \in X$,

2. *quasi-pseudometric* if $d(x, z) \leq d(x, y) + d(y, z)$ for all $x, y, z \in X$.

X equipped with a function d described above is called a *semi-pseudometric space* or a *quasi-pseudometric* space, depending on whether d is a semi-pseudometric or a quasi-pseudometric. A pseudometric is the same as a semi-pseudometric that is a quasi-pseudometric at the same time.

If d satisfies the property that $d(x, y) = 0$ implies $x = y$, then d is called a *semi-metric* if d is a semi-pseudometric, or a *quasi-metric* if d is a quasi-pseudometric.