Why

If x is related to y, the y is related to x, but how?

Definition

If R is a relation between X and Y, then the *converse* or *inverse* relation of R is a relation on Y and X relating $y \in Y$ to $x \in X$ if and only if $x\,R\,y$. If $R = R^{-1}$ then R is symmetric.

Notation

We denote the converse relation of R by R^{-1}.

Example

Let X be the set of people and let R be a relation in X. If R is "is a father of", then R^{-1} is "is a son of". If R is "is a mother of", then R^{-1} is "is a daughter of". If R is "is a brother of", then R^{-1} is "is a brother of". The relation "is a brother of" is symmetric.

Converse Relations

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Relations

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Cartesian Products

↓ ↘

Ordered Pairs   Set Powers

   Unordered Triples

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Pair Unions

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Set Unions

Unordered Pairs   Empty Set

↓ ↘

Set Specification

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Set Inclusion

↓ ↘

Standardized Accounts

Definitions   Accounts

Deductions   Quantified Statements

Logical Statements

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Statements

↓ ↘

Identities   Sets

Names

Objects   Letters