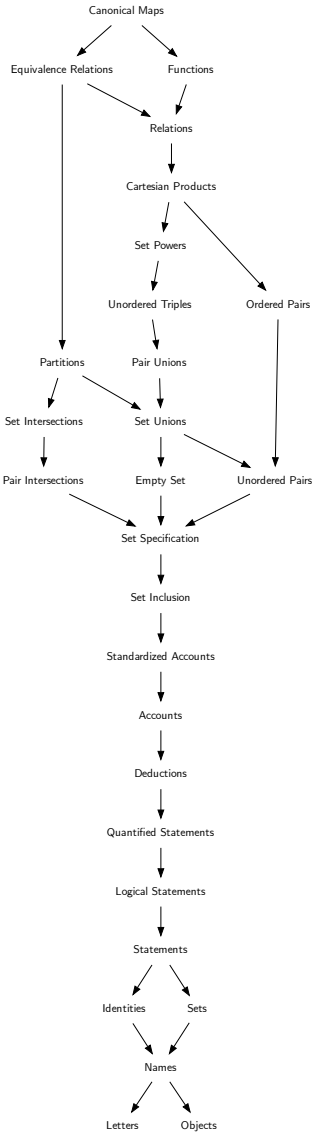
Why

How do equivalence classes and functions relate

Definition

We can associate to each element of a set its equivalence class under an equivalence relation. Let X denote a set and R an equivalence relation. We call the function $f : X \to X/R$ defined by $f(x) = x/R$ the *canonical map* from X to X/R.

Conversely, if f is an arbitrary function from X onto Y, we can naturally define an equivalence relation R in X so that for $a, b \in X$, $a\,R\,b \longleftrightarrow f(a) = f(b)$ f was onto, so for each $y \in Y$, there exists an $x \in X$ with $f(x) = y$. Now let $g : Y \to X/R$ be defined by $g(y) = x/R$. The values of g are the subset X which are mapped to the same value under f. Moreover, the function g is one-to-one.


Canonical Maps
Equivalence Relations
Functions
Relations
Cartesian Products
Set Powers
Unordered Triples
Ordered Pairs
Partitions
Pair Unions
Set Intersections
Set Unions
Pair Intersections
Empty Set
Unordered Pairs
Set Specification
Set Inclusion
Standardized Accounts
Accounts
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects