Why

We want to visualize function composition.

Definition

A *composition graph* (or *composition diagram*) is a directed graph along with a map from vertices to the powerset of a set and a map from edges to functions between sets associated with incident vertices.

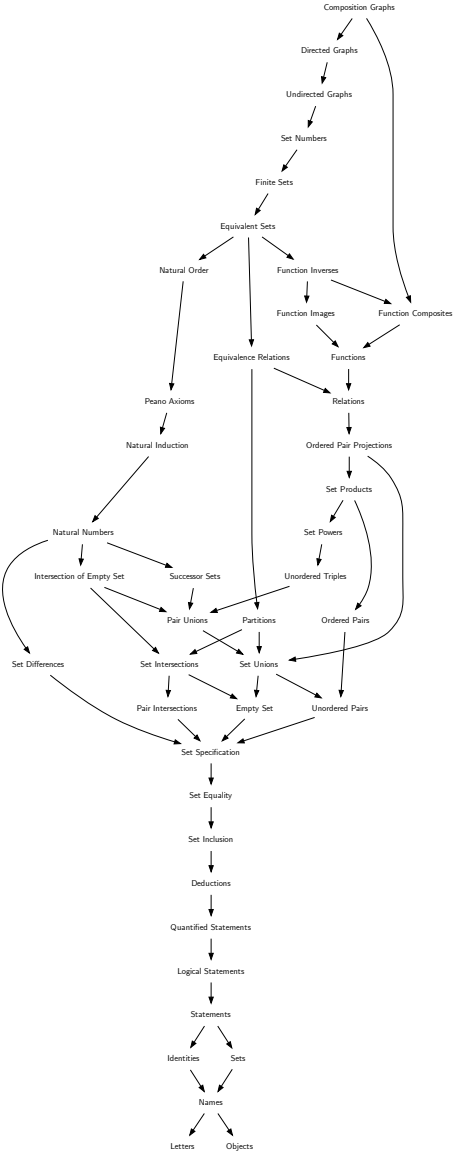
Example

For example, let A and R be sets and let $i : A \to A$, $f : A \to R$ and $g : R \to A$ be functions. We can consider the diagram whose graph is $(\{1, 2, 3\}, \{(1, 2), (2, 3), (1, 3)\})$, with vertices one and three corresponding to A, vertex 2 corresponding to R, edge $(1, 2)$ corresponding to f, edge $(2, 3)$ corresponding to g and edge $(1, 3)$ corresponding to i. [1]

Path composition

The function associated with a path (or *path composition*) is the composition of the functions corresponding to the edges along the path. The digram is *commutative* (call a *commutative diagram*) if the composition of any two paths between any two vertices result in identical functions.

[1] Future editions will include the highly important figures associated with function diagrams.


Composition Graphs
Directed Graphs
Undirected Graphs
Set Numbers
Finite Sets
Equivalent Sets
Natural Order
Function Inverses
Function Images
Function Composites
Equivalence Relations
Functions
Peano Axioms
Relations
Natural Induction
Ordered Pair Projections
Set Products
Natural Numbers
Set Powers
Intersection of Empty Set
Successor Sets
Unordered Triples
Pair Unions
Partitions
Ordered Pairs
Set Differences
Set Intersections
Set Unions
Pair Intersections
Empty Set
Unordered Pairs
Set Specification
Set Equality
Set Inclusion
Deductions
Quantified Statements
Logical Statements
Statements
Identities
Sets
Names
Letters
Objects