Why

We want to visualize function composition.

Definition

Let G be a graph (directed or undirected) on $\{1, \ldots, n\}$ and let $A = (A_1, \ldots, A_n)$ be a list of sets. We call the ordered pair (G, A) a *typed graph*. We call A_i the *ith domain*. For $S \subset \{1, \ldots, n\}$, we denote the product$\coprod_{s \in S} A_s$ by A_S.

If G is directed, we call a source vertex*exogenous* and otherwise we call a vertex *endogenous*.

Let $\bar{G} = (G, A)$ be a typed graph where G is directed. Let $f_i : A_{\mathrm{pa}_i} \to A_i$ for $i = 1, \ldots, n$ so that f is a sequence of functions. We call the ordered pair $(\bar{G}, f)$ a *function graph*[1] (or *function diagram*).

---

[1]This sheet is not to be confused with the graph of a function (see Functions).

Typed Graphs

Directed Graphs

Lists　　　Undirected Graphs

Direct Products　　　Set Numbers

Finite Sets

Equivalent Sets

Family Unions and Intersections　　　Natural Order　　　Function Inverses

Families　　　Function Images　　　Function Composites

Equivalence Relations　　　Functions

Peano Axioms　　　Relations

Natural Induction　　　Ordered Pair Projections

Set Products

Generalized Set Dualities　　　Natural Numbers　　　Set Powers

Set Unions and Intersections　　Set Dualities　Partitions　Intersection of Empty Set　Successor Sets　Unordered Triples

Ordered Pairs

Set Intersections　　　Set Complements　　　Pair Unions

Pair Intersections　　　Set Differences　Set Unions

Empty Set　　　Unordered Pairs

Set Specification

Set Equality

Set Inclusion

Deductions

Quantified Statements

Logical Statements

Statements

Identities　　　Sets

Names

Letters　　　Objects