



## Why

We want to visualize function composition.

## Definition

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

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

Let  $\bar{G} = (G, A)$  be a typed graph where  $G$  is directed. Let  $f_i : A_{\text{pa}_i} \rightarrow A_i$  for  $i = 1, \dots, n$  so that  $f$  is a sequence of functions. We call the ordered pair  $(\bar{G}, f)$  a *function graph*<sup>1</sup> (or *function diagram*).

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<sup>1</sup>This sheet is not to be confused with the graph of a function (see **Functions**).



