

Definition (Coproduct). Let \mathbf{C} be a category and let $X, Y \in \mathbf{Ob}_{\mathbf{C}}$ be objects. The *coproduct* of X and Y consists of the following constituent data, satisfying the following condition.

Data:

1. an object $Z \in \mathbf{Ob}_{\mathbf{C}}$ (“the coproduct” of X and Y)
2. *injection morphisms* $\iota_1 : X \rightarrow Z$ and $\iota_2 : Y \rightarrow Z$

Condition:

1. For any $T \in \mathbf{Ob}_{\mathbf{C}}$ and any morphisms $f : X \rightarrow T$, $g : Y \rightarrow T$, there exists a *unique* morphism $\psi_{f,g} : Z \rightarrow T$ such that $f = \iota_1 \circ \psi_{f,g}$ and $g = \iota_2 \circ \psi_{f,g}$.