objects. The *product* of X and Y is:

Constituents

1. an object $Z \in \mathsf{Ob}_{\mathbf{C}}$ (this is "the product" of X and Y);

2. *projection morphisms* $\pi_1: Z \to X$ and $\pi_2: Z \to Y$,

Definition (Categorical Product). Let C be a category and let $X, Y \in Ob_{\mathbb{C}}$ be

Conditions

1. For any $T \in \operatorname{Ob}_{\mathbb{C}}$ and any morphisms $f: T \to X, g: T \to Y$, there exists a unique morphism $\phi_{f,g}: T \to Z$ such that $f = (\phi_{f,g}) \ \ \pi_1$ and $g = (\phi_{f,g}) \ \ \pi_2$.