Definition (Isomorphism) Let \mathbf{C} be a category, let $X, Y \in \mathbf{C}$ be objects, and let $f: X \to Y$ be a morphism.

We say that f is an *isomorphism* if there exists a morphism $g: Y \to X$ such

that $f \circ g = \operatorname{Id}_X$ and $g \circ f = \operatorname{Id}_Y$.