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 $f \fatsemi g = \mathrm{Id}_X$ and $g \fatsemi f = \mathrm{Id}_Y$.