Definition (Category of sets)**.** The category of sets **Set** is defined by:

1. *Objects*: all sets.
2. *Morphisms*: given sets X and Y, the homset $\mathrm{Hom}_{\mathbf{Set}}(X; Y)$ is the set of all functions from X to Y.
3. *Identity morphism*: given a set X, its identity morphism Id_X is the identity function $X \to X$, $\mathrm{Id}_X(x) = x$.
4. *Composition operation*: the composition operation is the usual composition of functions.