

Definition 0.1. Functors between categories \mathcal{C} and \mathcal{D} forms the **functor category**

$$[\mathcal{C}, \mathcal{D}]$$

that has

- as objects the functors $F : \mathcal{C} \rightarrow \mathcal{D}$
- as morphisms the natural transformations $\alpha : F \Rightarrow G$
- as identity morphisms the identity natural transformation $\mathbf{1}_F$
(with components $(\mathbf{1}_F)_c = \mathbf{1}_{Fc}$)
- as composition the composition of natural transformations

See [1] Ch.1.7, [2] Ch.10.3.

[1] E. Riehl, *Category Theory in Context* (Dover, 2015).

[2] B. Milewski, *Category Theory for Programmers* (2019).
