Definition 0.1. Given a category $\mathcal{C}$ its **opposite category** $\mathcal{C}^{op}$ is obtained by reversing its morphisms:

- the objects of $\mathcal{C}^{op}$ are the same of $\mathcal{C}$
- if $f : a \to b$ is a morphism in $\mathcal{C}$ then there is a morphism $\bar{f} : b \to a$ in $\mathcal{C}^{op}$
- if $\mathbf{1}_a$ is the identity of a in $\mathcal{C}$ then $\bar{\mathbf{1}}_a$ is the identity in $\mathcal{C}^{op}$
- if $g \circ f : a \to c$ is the composite of $f : a \to b$ and $g : b \to c$ then $\overline{g \circ f} : c \to a$ is the composite of $\bar{f} : b \to c$ and $\bar{g} : c \to b$ thus

$$\overline{g \circ f} = \bar{f} \circ \bar{g}$$

  a statement in a category $\mathcal{C}$ is true if and only if the dual statement is true in $\mathcal{C}^{op}$

See [1] Ch.1.2 and [2] Ch.1.1.7.

[1] E. Riehl, *Category Theory in Context* (Dover, 2015).
[2] P. Perrone, *Notes on Category Theory with Examples from Basic Mathematics*, (2019).