

## **Definition** (Functor composition)

Consider categories  $\mathbf{A}, \mathbf{B}, \mathbf{C}$  and functors  $F : \mathbf{A} \rightarrow \mathbf{B}$ ,  $G : \mathbf{B} \rightarrow \mathbf{C}$ . Functor composition is given by  $F \circ G : \mathbf{A} \rightarrow \mathbf{C}$ , where:

- ▷ Given  $X \in \mathbf{Ob}_{\mathbf{A}}$ , one has  $(F \circ G)(X) := G(F(X))$ ;
- ▷ Given  $f \in \mathbf{Hom}_{\mathbf{A}}(X; Y)$ , one has  $(F \circ G)(f) := G(F(f))$ .