

Figure 1: Product

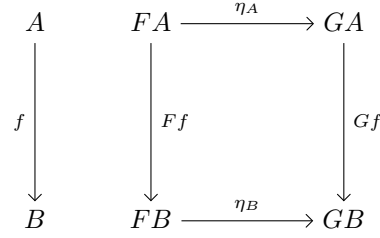


Figure 3: Natural Transformation

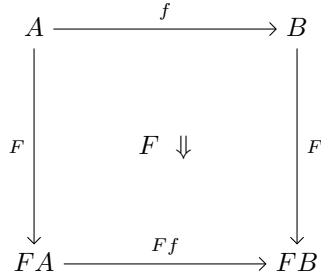


Figure 2: Functor

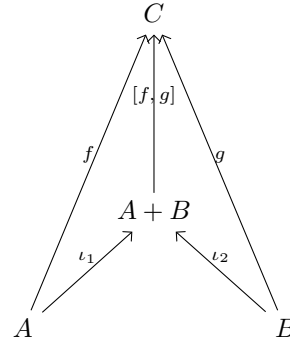


Figure 4: Sum (co-product)

Definition 1 (Category). A (small) Category \mathbf{C} is defined by:

- a set of objects,
- a set of arrows or morphisms s.t. for each arrow f are defined two objects A and B the domain and codomain of f denoted respectively $\text{dom}f$ and $\text{cod}f$. The arrow is then denoted $f : A \rightarrow B$,
- a composition law s.t. for any $f : A \rightarrow B$ and $g : B \rightarrow C$ there exists an arrow $f \circ g : A \rightarrow C$,
- an identity arrow $\text{id}_A : A \rightarrow A$ for any object A s.t., given arrows $f : A \rightarrow B$ and $g : C \rightarrow A$:

$$\begin{aligned} \text{id}_A \circ g &= g \\ f \circ \text{id}_A &= f \end{aligned}$$

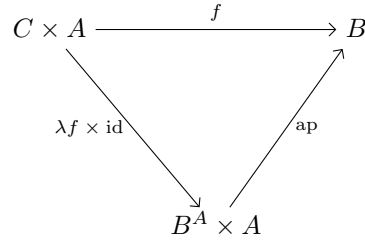


Figure 5: Exponential

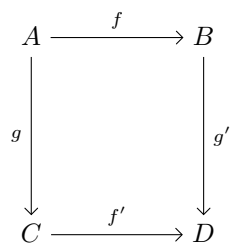


Figure 6: Pullback