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对象的类  $Ob(C)$

态射的类  $Mor(C)$

特定对象态射的类  $Hom_C(A, B)$

对偶范畴  $(Dual)$   $C^{op}$

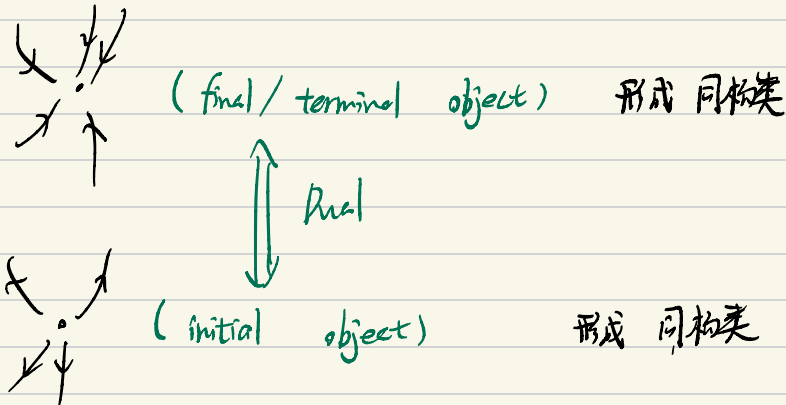
单态 (monomorphism) : 左可消

满态 (epimorphism) : 右可消

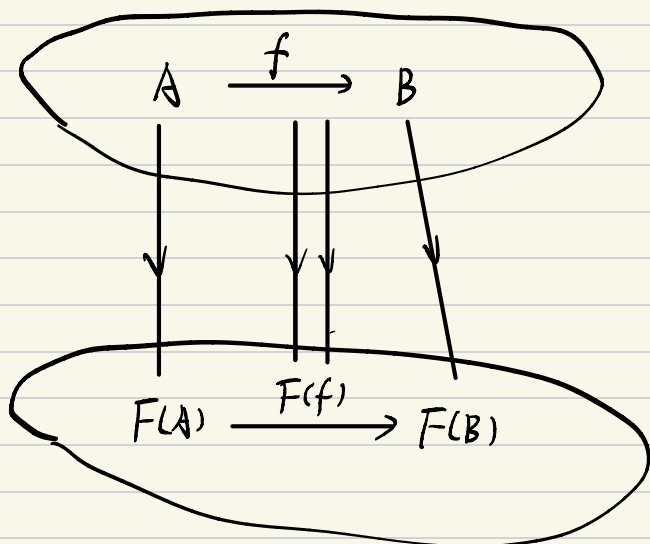
同构 (isomorphism) : 可逆

单态 + 满态  $\nRightarrow$  同构 ( $f: \mathbb{Z} \rightarrow \mathbb{Q}$ , 不存在非平凡环同态)

对象:

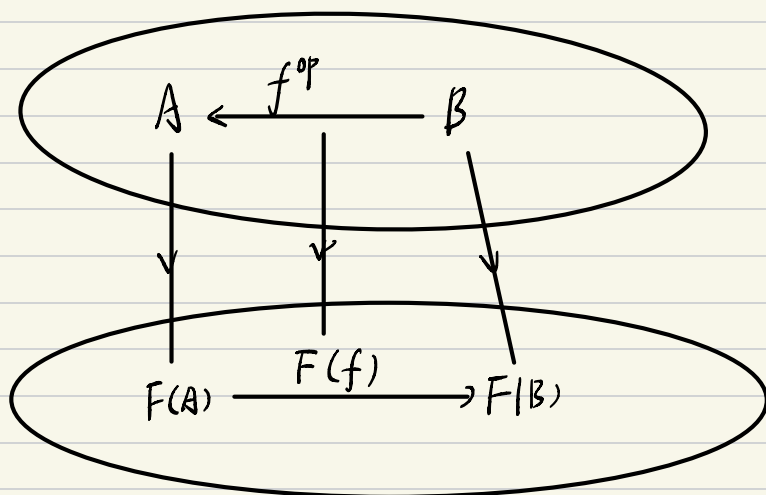


共变函子: covariant Functor



$Ab \hookrightarrow Grp \hookrightarrow Set \quad Top \hookrightarrow Set$  (Forgetful Functor)  
遗忘函子

逆变函子 contravariant Functor.



忠实函子 (Faithful Functor):

$$F|_{\text{Hom}_C(A, B)} : \text{Hom}_C(A, B) \rightarrow \text{Hom}_{F(C)}(F(A), F(B)) \quad \text{monomorphism.}$$

满函子 (Full Functor)

$$F|_{\text{Hom}_C(A, B)} : \text{Hom}_C(A, B) \rightarrow \text{Hom}_{F(C)}(F(A), F(B)) \quad \text{epimorphism.}$$

忠实 + 满  $\Leftrightarrow$  满忠实函子 / 嵌入 (几乎保留原范畴性质)

本质满射 / 稠密函子 (essentially surjective / dense functor)

$$\forall Y \in \text{Ob}(F(C)), \exists X \in \text{Ob}(C), (FX) \subseteq Y$$

[即同构意义下, 函子为满射]