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faithful functor

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A functor $T : \mathcal{C} \rightarrow \mathcal{D}$ is *faithful* if the *arrow function* of T is injective for every pair of objects in \mathcal{C} . More precisely, for every pair $C_1, C_2 \in \text{Ob}(\mathcal{C})$, the arrow function $T_{(C_1, C_2)}$ of T :

$$T_{(C_1, C_2)} : \text{hom}_{\mathcal{C}}(C_1, C_2) \rightarrow \text{hom}_{\mathcal{D}}(T(C_1), T(C_2))$$

given by $T_{(C_1, C_2)}(f) = T(f)$ is an injection. In other words, $T(f) = T(g)$ implies $f = g$.