

- (1) Show that there is a category where the objects are sets and the morphisms from A to B are triples (C, α, β) where C is a set and $\alpha: C \rightarrow A$ and $\beta: C \rightarrow B$ are functions. (The composition is by pullback.)
- (2) Let A be the category with three objects a, b, c and two non identity morphisms $a \rightarrow b$ and $a \rightarrow c$. Define a category where the objects are functors $A \rightarrow \mathbf{Sets}$.
- (3) What is a functor between two posets regarded as categories?
- (4) If G and H are groups what is a functor $F: BG \rightarrow BH$?