Definition (Free category on a graph)**.** Let $G = (V, A, s, t)$ be a graph. The *free category on* G, denoted $\mathbf{Free}(G)$, has as objects the vertices V of G, and given vertices $x \in V$ and $y \in V$, the morphisms $\mathbf{Free}(G)(x, y)$ are the paths from x to y. The composition of morphisms is given by concatenation of paths, and for any object $x \in V$, the associated identity morphism id_x is the trivial path which starts and ends at x.