ABSTRACT

PRODUCT OF CATEGORIES AND PRODUCT OF TWO OBJECTS IN A CATEGORY

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Category theory is a conceptual framework that describes abstract structures in mathematics and can facilitate the discussion of various concepts in mathematics, such as group theory, ring theory, topological spaces, and others. Category theory is a collection of "objects" and connected by "morphisms". Let $\mathcal{C}$ and $\mathcal{D}$ be categories. The product of two categories $\mathcal{C}$ and $\mathcal{D}$, is represented by $\mathcal{C} \times \mathcal{D}$ and referred to as the product category. In category theory there are also pairs of objects in a category where these object pairs can construct product categories. The objects $A \times B$ in $\mathcal{C}$ is said to be a product of A and B in $\mathcal{C}$ if to each object C element $\mathcal{C}$ and to each pair (f, g) of morphisms with $f : C \longrightarrow A$ and $g: C \longrightarrow B$, there is an exactly morphism $h : C \longrightarrow A \times B$, such that $f = P_A \circ h$ and $g = P_B \circ h$. This research discusses the product of categories and the product of two objects in a category, including concepts and properties related to the product of categories and the product of two objects in a category.

Keywords: *Category, Object, Morphism, Product, Group.*