Category Theory

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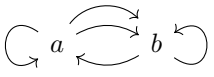
1 Category

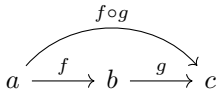
A category consists of *objects* and *morphism* or *arrows*.
An arrow has a beginning and an ending, and it goes from one object to another.
Objects serve the purpose of marking the beginning and ending of a morphism.



An example of
objects and morphisms

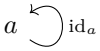
1.1 Composition

Composition is a property that says that if there is an arrow from a to b, and an arrow from b to c, there must exist an arrow from a to c.

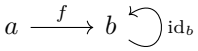


1.2 Identity

For every object there is an identity arrow.



The composition of an arrow with an identity is the arrow itself



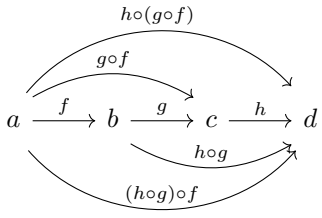
$$f \circ \mathrm{id}_b = f$$

and also vice versa

$$\mathrm{id}_b \circ f = f$$

1.3 Associativity

Compositions have the associative property



$$h \circ (g \circ f) = (h \circ g) \circ f$$