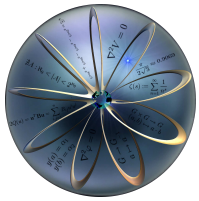

planetmath.org

Math for the people, by the people.

forgetful functor

Canonical name	ForgetfulFunctor
Date of creation	2013-03-22 12:38:43
Last modified on	2013-03-22 12:38:43
Owner	RevBobo (4)
Last modified by	RevBobo (4)
Numerical id	4
Author	RevBobo (4)
Entry type	Definition
Classification	msc 18A05
Related topic	AdjointFunctor
Defines	forgetful

Let $\mathcal{C}$ and $\mathcal{D}$ be categories such that each object c of $\mathcal{C}$ can be regarded an object of $\mathcal{D}$ by suitably ignoring structures c may have as a $\mathcal{C}$-object but not a $\mathcal{D}$-object. A functor $U : \mathcal{C} \to \mathcal{D}$ which operates on objects of $\mathcal{C}$ by "forgetting" any imposed mathematical structure is called a *forgetful functor*. The following are examples of forgetful functors:

1. U : **Grp** $\to$ **Set** takes groups into their underlying sets and group homomorphisms to set maps.

2. U : **Top** $\to$ **Set** takes topological spaces into their underlying sets and continuous maps to set maps.

3. U : **Ab** $\to$ **Grp** takes abelian groups to groups and acts as identity on arrows.

Forgetful functors are often instrumental in studying adjoint functors.