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factor system

Canonical name	FactorSystem
Date of creation	2013-03-22 14:23:28
Last modified on	2013-03-22 14:23:28
Owner	mathcam (2727)
Last modified by	mathcam (2727)
Numerical id	4
Author	mathcam (2727)
Entry type	Definition
Classification	msc 20J06

Using the notation in the entry Group Cohomology, a 2-cocycle or *factor system* is a map $\phi : G \times G \rightarrow M$ such that for all $\alpha, \beta, \gamma \in G$, we have

$$\alpha\phi(\beta, \gamma) - \phi(\alpha\beta, \gamma) + \phi(\alpha, \beta\gamma) - \phi(\beta, \gamma) = 0.$$

Factor systems play a role in determining classes of group extensions of G by M in the case where M is taken to be an abelian normal subgroup of G .