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binary operation

Canonical name	BinaryOperation
Date of creation	2013-03-22 13:08:12
Last modified on	2013-03-22 13:08:12
Owner	mclase (549)
Last modified by	mclase (549)
Numerical id	7
Author	mclase (549)
Entry type	Definition
Classification	msc 08A99
Synonym	internal composition
Related topic	Arity
Related topic	Operation

A *binary operation* on a set  $X$  is a function from the Cartesian product  $X \times X$  to  $X$ . A binary operation is sometimes called *internal composition*.

Rather than using function notation, it is usual to write binary operations with an operation symbol between elements, or even with no operation at all, it being understood that juxtaposed elements are to be combined using an operation that should be clear from the context.

Thus, addition of real numbers is the operation

$$(x, y) \mapsto x + y,$$

and multiplication in a groupoid is the operation

$$(x, y) \mapsto xy.$$