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product

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Related topic	Multiplication
Related topic	RuleOfProduct
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Defines	factor
Defines	factor of a product

The word *product* in mathematics generally means the result of some of *multiplication* operation, <http://planetmath.org/Iei.e>. of certain of mapping $X \times X \rightarrow Y$; such operations are commonly distributive over the *addition* operation of X if it is defined.

If x_1 and x_2 are two elements of the set X , giving the product $y \in Y$, then x_1 and x_2 are in general called the *factors* of this product.

Some most usual products are

- the <http://planetmath.org/Ringring> product (also in fields), especially the product of numbers and the product of square matrices;
- on vectors the scalar product, the vector product, the dyad product and the Hadamard product; on ideals the product of ideals;
- the Cartesian product, the direct products of various systems (not in with any additions).

Such kinds of product that are associative, allow to form a product of more than two factors, which is justified by the theorem in the entry general associativity. E.g. the usual product of the integers from 1 to n is the factorial of n .