Conditions

My question is what are some different things you can do to a number/numbers? (add, subtract, multiply divide, multiply by itself find the opposite)
How can you find more ways to do things with numbers?

Solution

In its simplest meaning in mathematics and logic, an operation is an action or procedure which produces a new value from one or more input values, called "operands". There are two common types of operations: unary and binary. Unary operations involve only one value, such as negation and trigonometric functions. Binary operations, on the other hand, take two values, and include addition, subtraction, multiplication, division, and exponentiation.

Operations can involve mathematical objects other than numbers. The logical values true and false can be combined using logic operations, such as and, or, and not. Vectors can be added and subtracted. Rotations can be combined using the function composition operation, performing the first rotation and then the second. Operations on sets include the binary operations union and intersection and the unary operation of complementation. Operations on functions include composition and convolution.

Operations may not be defined for every possible value. For example, in the real numbers one cannot divide by zero or take square roots of negative numbers. The values for which an operation is defined form a set called its domain. The set which contains the values produced is called the codomain, but the set of actual values attained by the operation is its range. For example, in the real numbers, the squaring operation only produces nonnegative numbers; the codomain is the set of real numbers but the range is the nonnegative numbers.

Operations can involve dissimilar objects. A vector can be multiplied by a scalar to form another vector. And the inner product operation on two vectors produces a scalar. An operation may or may not have certain properties, for example it may be associative, commutative, anticommutative, idempotent, and so on.

The general definition of operation is below:

An operation w is a function of the form $w: V \to Y$, where $V \subset X_1 \subset X_2 \dots \subset X_k$. The sets X_k are called the domains of the operation, the set Y is called the codomain of the operation. and the fixed non-negative integer k (the number of arguments) is called the type or arity of the operation. Thus a unary operation has arity one, and a binary operation has arity two. An operation of arity zero, called a nullary operation, is simply an element of the codomain Y. An operation of arity k is called a k-ary operation. Thus a k-ary operation is a (k+1)-ary relation that is functional on its first k domains.

The above describes what is usually called a finitary operation, referring to the finite number of arguments (the value k). There are obvious extensions where the arity is taken to be an infinite ordinal or cardinal, or even an arbitrary set indexing the arguments.

For example we can define the operation $*$ in the next way:

$$V = \{v, v \epsilon R\}$$

and

$$\forall v, w \epsilon V, v * w = \frac{v^2 + w^2}{2}$$

Then

$$Y = \{v, w \epsilon V : v * w = \frac{v^2 + w^2}{2}\}$$

And this is also an operation.