

## op\_arith — Arithmetic operators

Description Diagnostics	Syntax Also see	Remarks and examples	Conformability
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## Description

The above operators perform basic arithmetic.

## Syntax

$a + b$	addition
$a - b$	subtraction
$a * b$	multiplication
$a / b$	division
$a \wedge b$	power
$-a$	negation

where  $a$  and  $b$  may be numeric scalars, vectors, or matrices.

## Remarks and examples

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Also see [M-2] [op\\_colon](#) for the `:+`, `:-`, `:*`, and `:/` operators. Colon operators have relaxed conformability restrictions.

The `*` and `:*` multiplication operators can also perform string duplication—`3*"a" = "aaa"`—see [M-5] [strdup\(\)](#).

## Conformability

$a + b, a - b:$

<i>a</i> :	$r \times c$
<i>b</i> :	$r \times c$
<i>result</i> :	$r \times c$

$a * b:$

<i>a</i> :	$k \times n$	$k \times n$	$1 \times 1$
<i>b</i> :	$n \times m$	$1 \times 1$	$n \times m$
<i>result</i> :	$k \times m$	$k \times n$	$n \times m$

$a / b:$

<i>a</i> :	$r \times c$
<i>b</i> :	$1 \times 1$
<i>result</i> :	$r \times c$

$a \wedge b:$

<i>a</i> :	$1 \times 1$
<i>b</i> :	$1 \times 1$
<i>result</i> :	$1 \times 1$

$-a$ :  
    *a*:      $r \times c$   
    *result*:      $r \times c$

### Diagnostics

All operators return missing when arguments are missing.

$a*b$  with  $a$ :  $k \times 0$  and  $b$ :  $0 \times m$  returns a  $k \times m$  matrix of zeros.

$a/b$  returns missing when  $b==0$  or when  $a/b$  would result in overflow.

$a^b$  returns a real when both  $a$  and  $b$  are real; thus,  $(-4)^.5$  evaluates to missing, whereas  $(-4+0i)^.5$  evaluates to  $2i$ .

$a^b$  returns missing on overflow.

### Also see

[M-2] [exp](#) — Expressions

[M-2] [intro](#) — Language definition