

# Syntax

<i>Math</i>	<i>Eigenmath</i>	<i>Comment</i>
$a = b$	<code>a == b</code>	<i>test for equality</i>
$-a$	<code>-a</code>	<i>negation</i>
$a + b$	<code>a+b</code>	<i>addition</i>
$a - b$	<code>a-b</code>	<i>subtraction</i>
$ab$	<code>a b</code>	<i>multiplication, also <code>a*b</code></i>
$\frac{a}{b}$	<code>a/b</code>	<i>division</i>
$\frac{a}{bc}$	<code>a/b/c</code>	<i>division is left-associative</i>
$a^2$	<code>a^2</code>	<i>power</i>
$\sqrt{a}$	<code>sqrt(a)</code>	<i>square root, also <code>a^(1/2)</code></i>
$a(b + c)$	<code>a (b+c)</code>	<i>space is required</i>
$f(a)$	<code>f(a)</code>	<i>function</i>
$\begin{pmatrix} a \\ b \\ c \end{pmatrix}$	<code>(a,b,c)</code>	<i>vector</i>
$\begin{pmatrix} a & b \\ c & d \end{pmatrix}$	<code>((a,b),(c,d))</code>	<i>matrix</i>
$F^1_2$	<code>F[1,2]</code>	<i>tensor component access</i>
	<code>"hello, world"</code>	<i>string literal</i>
$\pi$	<code>pi</code>	
$e$	<code>exp(1)</code>	<i>natural number</i>

Arithmetic operators have the expected precedence of multiplication and division before addition and subtraction. Subexpressions in parentheses have highest precedence.

Parentheses are required around negative exponents. For example,

$10^{(-3)}$

instead of

$10^{-3}$

The reason for this is that the binding of the negative sign is not always obvious. For example, consider

$x^{-1/2}$

It is not clear whether the exponent should be  $-1$  or  $-1/2$ . Hence the following syntax is required.

$x^{(-1/2)}$

In general, parentheses are always required when the exponent is an expression. For example,  $x^{1/2}$  is evaluated as  $(x^1)/2$  which is probably not the desired result.

$x^{1/2}$

$\frac{1}{2}x$

Using  $x^{(1/2)}$  yields the desired result.

$x^{(1/2)}$

$x^{1/2}$