Function definitions

The following example defines a sinc function and evaluates it at $\pi/2$.

```
f(x) = sin(x)/x
f(pi/2)
```

$$\frac{2}{\pi}$$

A function definition can be recalled using `binding`.

```
binding(f)
```

$$\frac{\sin(x)}{x}$$

To define a local symbol in a function, extend the argument list. In the following example, argument `y` is used as a local symbol. Note that function `L` is called without supplying an argument for `y`.

```
L(f,n,y) = eval(d(exp(-y) y^n, y, n) exp(y) / n!, y, f)
L(cos(x),2)
```

$\frac{1}{2}\cos(x)^2 - 2\cos(x) + 1$

Sometimes it is necessary to evaluate an argument at a particular value. In this case `eval` should be used.

```
h(f,a,b) = eval(f,x,b) - eval(f,x,a)
h(x^2, 1, 2)
```

3

Use `do` when multiple steps are needed in a function. The last `do` item is the return value. The following example defines function `I` for integrating hydrogen wavefunctions.

```
I(f) = do(
  f = f r^2 sin(theta),
  f = expform(f),
  f = defint(f, theta, 0, pi, phi, 0, 2 pi),
  f = integral(f,r),
  -eval(f,r,0) -- return value
)
```

Notes:
1. Maximum number of arguments is nine.
2. Argument scope is restricted to just the function definition.
3. Function definitions cannot be nested.