MicroWithR Cheat Sheet

1. Basic Operators

Operator	Outcome(s)
<-, ->, =	Assign: left, right, generic
!	Not
1, 11	Or: element-wise, entire list
&, &&	And: element-wise, entire list
==, <, >	Equal to, less than, greater than
+, -, *, /, ^	Add, subtract, multiply, divide, exponent
>	Pipe code result forward

2. Base R Functions

Function	Outcome(s)
plot(), curve()	Create a new x-y or function plot
abline()	Add line with specified intercept/slope to plot
<pre>lines(), segments(), arrows(), polygon()</pre>	Add line or shape to plot with specified x-y coords
function()	Define a math or R function

3. Numerical Solutions Functions

Function [package::function()]	Outcome
nleqslv::nleqslv()	Solves systems of equations
Rsolnp::solnp()	Nonlinear constrained optimization

4. Analytic Solutions Functions

Function [package::function()]	Outcome
Ryacas::ysym(), Ryacas::yac_symbol()	Convert characters/expression to yac_sym object
<pre>Ryacas::yac_str()</pre>	Convert yac_sym object to character string
<pre>Ryacas::as_r(), Ryacas::yac_expr()</pre>	Convert yac_sym to R object/expression
<pre>Ryacas::y_rmvars()</pre>	Remove variables (i.e. left-hand side)
<pre>stats::deriv(), Deriv::Deriv()</pre>	Take symbolic derivatives (R expression)
Ryacas::deriv()	Take symbolic derivatives (yac_sym object)
base::solve()	Invert a matrix, solve a numerical linear system
deriv::Solve()	Solve string expressions for specified variables
Ryacas::solve()	Solve yac_sym equations for specified variables
<pre>Ryacas::with_value()</pre>	Substitute value or yac_sym expression for variable
Deriv::Simplify()	Simplify string expressions (works pretty well)
<pre>Ryacas::simplify()</pre>	Simplify yac_sym objects (works less well)
Ryacas::yac(MaxEvalDepth())	Set the maximum stack depth