Scheme Reference Card

(keyed to a purely-functional subset of PLT Pretty Big Scheme)
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Last update: 7 September 2009

Literals	
Form	**Description**
#f #t	are truth values false and true (aka "Booleans"). Also, any value that is not #f will be interpreted as true.
1 42 -37	are integers
5/7 -2/4	are rationals
2.5 1e12 0.5e-2 -3.14e8	are reals
1.0+1.0i	are complex (parts can be inter, rational, or real)
'foo	is a symbol (sort of like a string, but with special properties)
'(foo 1 2 3.4 #f)	is a list of literal values (symbol, integer, real, Boolean)
"foo bar"	is a string, which is not the same as a symbol
'\a '\b '\c	are character literals

Defining Functions	
(**define** s_1 expr)	Define symbol s_1 to have the value of expression expr.
(**define** (f_1 a_1 . . .) expr)	Define function named f_1 with zero or more arguments a_1 . . . to have the value of expression expr.
(**lambda** (a_1 . . .) expr)	Evaluates to an anonymous function which, with arguments a_1 . . . evaluates to the value of expr.

Other Special Forms	
(**if** c_1 e_2 e_3)	Evaluates c_1. If the result is not #f, returns the value of e_2, otherwise returns the value of e_3.
(**cond** (c_1 e_1) . . . (**else** e_n))	Evaluates c_1. If the result is not #f, returns the value of e_1, otherwise evaluates c_2, etc. If no value of a c_i is not #f, returns the value of e_n.
(**case** e_0 (v_1 e_1) . . .)	Evaluates e_0, then compares the result to the values v_1 . . . until a match v_i is found, in which case e_i is returned. If there is no match, the result is undefined, so better be sure there is a match.
(**let** ((s_1 e_1) . . .) expr)	Evaluates the expressions e_1 . . ., binding symbols s_1 . . . locally to their values, then evaluates expr in the resulting environment.
(**let*** ((s_1 e_1) . . .) expr)	Similar to let, except the environment accumulates as successive expressions bindings are made. That is, the value of e_2 is computed with the binding of s_1, etc.
(**letrec** ((s_1 e_1) . . .) expr)	Similar to let, except that the environment in which the expressions are evaluated includes all the bindings created by the bindings themselves.

Logic Functions	
(**and** n_1 . . .)	Return #f (false) if some argument is #f, otherwise return the last argument.
(**or** n_1 . . .)	Return the first value that is not #f, otherwise return #f.
(**not** n_1)	Return #t if the argument is #f, otherwise return #f.
(**boolean?** n_1)	Return #t if the argument is #t or #f, otherwise return #f.

Numeric Functions	
(**+** n_1 . . .)	Return the sum of numbers n_1 . . . .
(**-** n_1 n_2 . . .)	Return the first number n_1 minus the sum of the remaining numbers n_2 . . ..
(**-** n_1)	Return the negative of the number n_1.
(***** n_1 . . .)	Return the product of numbers n_1 . . . .
(**/** n_1 n_2 . . .)	Return the first number n_1 divided by the product of the remaining numbers n_2 . . ..
(**/** n_1)	Return the reciprocal of the number n_1.
(**max** n_1 . . .)	Returns the maximum of numbers n_1 . . . .
(**min** n_1 . . .)	Returns the minimum of numbers n_1 . . . .
(**modulo** n_1 n_2)	Return the remainder of dividing n_1 by n_2.
(**=** n_1 n_2)	Return #t if numbers n_1 and n_2 are equal, otherwise #f.
(**<** n_1 n_2)	Return #t if number n_1 is less than n_2, otherwise #f.
(**>** n_1 n_2)	Return #t if number n_1 is greater than n_2, otherwise #f.
(**<=** n_1 n_2)	Return #t if number n_1 is less than or equal n_2, otherwise #f.
(**>=** n_1 n_2)	Return #t if number n_1 is greater than or equal n_2, otherwise #f.
(**integer?** n_1)	Return #t if number n_1 is an integer, otherwise #f.
(**rational?** n_1)	Return #t if number n_1 is a rational, otherwise #f. (Note: Integers are rational.)
(**real?** n_1)	Return #t if number n_1 is a real, otherwise #f. (Note: Rationals are real.)
(**complex?** n_1)	Return #t if number n_1 is a real otherwise #f. (Note: Reals are complex.)
(**exact?** n_1)	Return #t if number n_1 is exact, otherwise #f.
(**inexact?** n_1)	Return #t if number n_1 is not exact, otherwise #f.
(**zero?** n_1)	Return #t if number n_1 is some kind of zero, otherwise #f.
(**positive?** n_1)	Return #t if *real* number n_1 is positive, otherwise #f.
(**negative?** n_1)	Return #t if *real* number n_1 is negative, otherwise #f.
(**odd?** n_1)	Return #t if *integer* n_1 is odd, otherwise #f.
(**even?** n_1)	Return #t if *integer* n_1 is even, otherwise #f.
(**abs** n_1)	Return the absolute value of *real* number n_1.
(**magnitude** n_1)	Return the magnitude of *complex* number n_1.
(**angle** n_1)	Return the angle in radians of the polar coordinates for *complex* number n_1.
(**make-rectangular** r_1 r_2)	Make a complex number from reals as rectangular coordinates.
(**make-polar** r_1 r_2)	Make a complex number from reals as polar coordinates.

(**quotient** n_1 n_2)	Return the quotient of dividing integer n_1 by integer n_2.
(**remainder** n_1 n_2)	Return the remainder of dividing integer n_1 by integer n_2.
(**floor** n_1)	Returns the greatest integer lessthan or equal to n_1.
(**ceiling** n_1)	Returns the least integer greater than or equal to n_1.
(**truncate** n_1)	Returns the result of discarding any fractional part of n_1.
(**round** n_1)	Returns the result of rounding the fractional part of n_1 to the nearest integer.
(**gcd** n_1 . . .)	Returns the greatest common divisor of numbers n_1 . . . .
(**lcm** n_1 . . .)	Returns the least common multiple of numbers n_1 . . . .
(**numerator** n_1)	Returns the numerator of a rational number n_1.
(**denominator** n_1)	Returns the denominator of a rational number n_1.
(**expt** n_1 n_2)	Returns the number n_1 raised to the power n_2. (Complex powers are allowed).
(**exp** n_1)	Returns *e* to the power n_1.
(**log** n_1)	Returns the natural logarithm of n_1.
(**sqrt** n_1)	Returns the square root of n_1.
(**real-part** n_1)	Returns the real part of complex number n_1.
(**imag-part** n_1)	Returns the imaginary part of complex number n_1.
(**inexact->exact** n_1)	Returns a rational version of inexact number n_1.
(**exact->inexact** n_1)	Returns an inexact version of number n_1.
(**sin** n_1) (**cos** n_1) (**tan** n_1) (**asin** n_1) (**acos** n_1) (**atan** n_1)	Returns the sin, etc. of number n_1.

List Functions	
(**list** a_1 . . .)	Evaluate the arguments a_1 . . ., forming a list of the results.
(**cons** a_1 L_2)	Form a list with the value of a_1 as the first element and list L_2 as the rest of the list. (If L_2 is not a list, will return a "dotted pair" of the values.)
(**null?** L_1)	Returns #t if the value of L_1 is the empty list, #f otherwise.
(**first** L_1)	Return the first element of non-empty list L_1.
(**rest** L_1)	Return a list of all but the first element of non-empty list L_1.
(**list-ref** L_1 n_2)	Returns the n_2th element of list L_1, where is a non-negative integer. The length L_1 of must be at most n_2–1.
(**second** L_1) (**third** L_1) . . . (**eighth** L_1)	Return the indicated element of list L_1, which must have enough elements.
(**length** L_1)	Return the length of list L_1.
(**append** L_1 . . .)	Create a list of the elements of followed L_1 by those of the remaining arguments.
(**member** a_1 L_2)	Return the first suffix of list L_2 that begins with a_1. If there is no such suffix, return #f.
(**map** f_1 L_2 . . .)	Apply the function f_1 element-wise to the lists. The arity of f_1 must be equal to the number list arguments, and each list must be of the same length.
(**filter** p_1 L_2 . . .)	Filter out elements x for which (p_1 x) is #t from list L_2.

(**apply** f_1 L_2)	Apply the function f_1 to each element of the list L_2. The length of the list must be the same as the arity of the function. If is a built-in, then the list can be any length compatible with that function.
(**foldl** f_1 v_2 L_3) (**foldr** f_1 v_2 L_3)	Apply the binary function f_1 to the list of elements, grouping from the left (foldl) or right (foldr). The value v_2 must be a unit element for the function f_1.
(**list?** a_1)	Return #t if a_1 is a proper list, otherwise #f.
(**pair?** a_1)	Return #t if a_1 is a pair (created by cons), otherwise #f.
(**assoc** v_1 A_2)	Returns the first list in list of lists A_2 that begins with v_1. Returns #f if there is no such list.

Equality	
(**equal?** a_1 a_2)	Return #t if data values a_1 and a_2 are equal, otherwise #f.
(**eq?** a_1 a_2)	Return #t if data values a_1 and a_2 are in the same memory locations, otherwise #f.
(**=** n_1 n_2 . . .)	Return #t if ***numbers*** n_1 . . . are equal, otherwise #f.
(**string=?** s_1 s_2)	Return #t if ***strings*** s_1 and s_2 are equal, otherwise #f.
(**char=?** c_1 c_2)	Return #t if ***characters*** c_1 and c_2 are equal, otherwise #f.
(**symbol=?** s_1 s_2)	Return #t if ***symbols*** s_1 and s_2 are equal, otherwise #f.

String Functions	
(**string->list** e_1)	Evaluate e_1, which should yield a string, then return the list of chars in the string.
(**symbol->string** e_1)	Evaluate e_1, which should yield a symbol, then return the string comprised of chars in the symbol.
(**string->symbol** e_1)	Evaluate e_1, which should yield a string, then return the symbol constructed from chars in the string.
(**string->number** e_1)	Evaluate e_1, which should yield a string, then return a number obtained by converting the chars in the string.
(**string->append** e_1. . .)	Form a new string from the characters of the argument values.
(**string<=?** e_1 e_2) **string<? string=?** **string>=? string>?**	Compare strings in apparent ways.
(**substring** e_1 n_2 n_3)	Return the sub-string of string e_1, from chars n_2 through n_3, the first char having index 0.
(**substring** e_1 n_2)	Return the sub-string of string e_1, from chars n_2 through the end of the string.
(**string-length** e_1)	Return the length of string e_1.
(**string-ref** e_1 n_2)	Return the char of string $e_1$at index n_2, the first char having index 0.
(**char<=?** e1 e2) **char <? char =?** **char >=? char >?**	Compare characters in apparent ways.