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; A program is a sequence of "top level" expressions and statements.

; • Expression Forms •
; • Literal Value •

      ; inserted/pasted image
function-name  ; function by name, from the language or from a definition
±n.n ±n/n  ; number as decimal or fraction
#true #false  ; boolean
"⋯characters⋯"  ; text
(list literal-value etc)  ; list

; • Variable Reference :  variable-name  ; from a definition

; • Function Call :  (function-name argument-expression etc)

; • Parameter Reference :  parameter-name  ; in the body of a function definition

; • Conditional :  (if condition-expression consequent-expression
                       else alternative-expression)

; • Statement Forms •
; • Definition of Variable or Function •

(define variable-name value-expression)
(define (function-name parameter-name etc)  ; "header"
  body-expression)

; • Assertion / Test :  (same! expression      (true!  expression)
                               expression      (false! expression)
                               etc)

; • Inspect Evaluation •

(step expression)   (step (hide function-name/call etc)
                          expression)

; Show expressions produced by replacing sub-expressions that are in the following forms
;  until reaching the literal value of the expression or encountering an error.

(function-name literal etc)

; • For a function from a definition :
;     If the number of arguments and parameter names differ : report an error.
;     If the function name or this whole call is a hide option : skip to result value.
;     Otherwise : copy the function's body and substitute the arguments in place of
;      the parameter names wherever those names occur in the body.
; • For the function  map  or  combine  : match its first pattern below, then :
;     If the expression doesn't match its pattern : report an error.
;     Otherwise : determine the literal values for f  a  b  c ... , then substitute those
;      into the rule's second pattern.

  (map f (list a b c etc)  → (list (f a) (f b) (f c) etc)
  (combine f (list a b c etc)  → (f a b c etc)

; • For any other function from our language :
;     If there are the wrong number or kind of arguments : report an error.
;     Otherwise : substitute a directly computed value (see the "Function Examples")

variable-name  → literal  ; • Substitute variable's previously-computed value.

(if ⋯)  ; • Based on the evaluation state of the condition :

  (if #true consequent          (if #false consequent
     else alternative)             else alternative)
   → consequent                  → alternative

  (if non-boolean-literal ⋯)  ; report an error

  (if condition ⋯)  ; evaluate condition first

; • Function Design •

; Goal Example :  (same! (function-name argument etc) literal)

; Full Design :  (same! (function-name argument etc)
                        fully-generalizable-expression)

; ... where the generalizable expression only uses the arguments as-is, so it can be used
;  as the body of the function's definition by replacing arguments with parameter names.

; Partial Design :  (same! (function-name argument etc)
                           partially-general-expression)
; ... where the partially general expression is not fully generalizable, but not just literal.
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; Function Examples

; • Equality Predicate :  (true! (same? (+ 1 1) 2))   (false! (same? 3 2))

; • Type Predicates •

  (true! (image?  ))                 (true! (boolean? #false))
  (true! (function? flip))           (true! (text? "Hi!"))
  (true! (number? -12.3))            (true! (list? (list  5)))

; • Function Predicates :  (true! (unary? flip))   (false! (binary? flip))

; • Image Functions •
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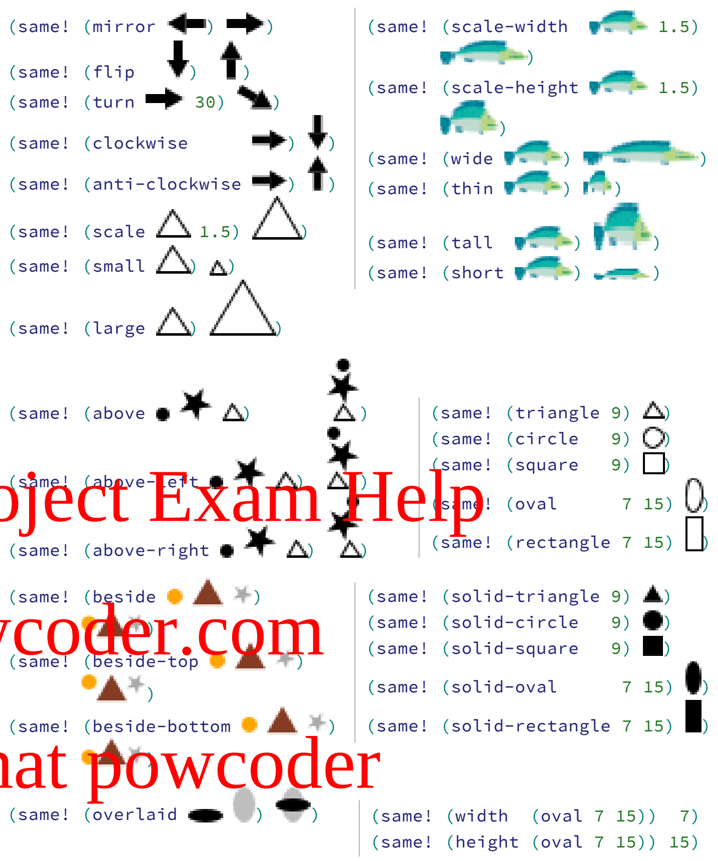

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  (same! (mirror  )  )              (same! (scale-width  1.5)
  (same! (flip  )  )                  )
  (same! (turn  30)  )              (same! (scale-height  1.5)
  (same! (clockwise  )  )             )
  (same! (anti-clockwise  )  )      (same! (wide  )  )
  (same! (scale  1.5)  )            (same! (thin  )  )
  (same! (small  )  )               (same! (tall  )  )
  (same! (large  )  )               (same! (short  )  )

  (same! (above  )  )                  (same! (triangle 9)  )
  (same! (above-left  )  )             (same! (circle   9)  )
  (same! (above-right  )  )            (same! (square   9)  )
                                       (same! (oval      7 15)  )
                                       (same! (rectangle 7 15)  )

  (same! (beside  )  )                 (same! (solid-triangle 9)  )
  (same! (beside-top  )  )             (same! (solid-circle   9)  )
  (same! (beside-bottom  )  )          (same! (solid-square   9)  )
                                       (same! (solid-oval      7 15)  )
                                       (same! (solid-rectangle 7 15)  )

  (same! (overlaid  )  )               (same! (width  (oval 7 15))  7)
                                       (same! (height (oval 7 15)) 15)

; •  Numeric Functions •

  (same! (+ 2 10 3) 15)   (same! (- 12)  -12)   (same! (/ 12 3) 4)
  (same! (* 2 10 3) 60)   (same! (- 12 3)  9)

  (same! (number->text -12) "-12")

; • Text Functions •

  (same! (text-length "one") 3)
  (same! (text-join "Hi" " human" "!") "Hi human!")

  (same! (text->image "Hi!") Hi!)
  (same! (text->list  "Hi!") (list "H" "i" "!"))

; • List Functions •

  (same! (list (star 10) (+ 2 3) (text? 4)) (list  5 #false))

  (same! (length  (list  5 #false)) 3)

  (same! (first   (list  5 #false)) )
  (same! (rest    (list  5 #false)) (list 5 #false))

  (same! (reverse (list  5 #false)) (list #false 5 ))

  (same! (range   8)  (list 0 1 2 3 4 5 6 7))
  (same! (range 3 8)        (list 3 4 5 6 7))
  (same! (range 3 8 2)      (list 3   5   7))
```