; A program is a sequence of 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  ; variable, from a definition
```

; Function Call

```
(function-name expression etc)
; — the expressions after the function name are the "argument" expressions
```

; ● Statement Forms ●

; Definition of Variable

```
(define variable-name expression)
; — the expression after the variable name is the "value" expression
```

; Definition of Function

```
(define (function-name parameter-name etc)
  expression)
; — the parenthesized function name with parameter names is the "header"
; — the expression after the header is the "body" expression
```

; Reveal Algebraic Evaluation Sequence

```
(step expression)
```

; Show the sequence of expressions produced by replacing sub-expressions
; that are in the following forms, until that produces the literal value of the
; expression or stops and reports an error.

```
… (function-name literal-value etc) …
```

; • For the function map : match the first pattern below to determine the literals
; f a b c … , then substitute those literals into its rule's second pattern.
; If the expression doesn't match its pattern report an error.

```
(map  f  (list       a         b             c    etc))
---------------------------------------------------------
 →      (list ( f  a ) ( f  b ) ( f  c ) etc)
```

; • For a function (other than map or list) from our language: substitute a directly
; computed value, or report an error if there are the wrong number or kind of
; arguments needed by the function.

; • For a function from a definition: copy its body and substitute the arguments
; in place of the parameter names wherever those names occur in the body,
; or report an error if the number of arguments and parameter names differ.

```
… variable-name …
 → literal-value
```

; Substitute the value that was computed when the variable was defined.

; Function Examples

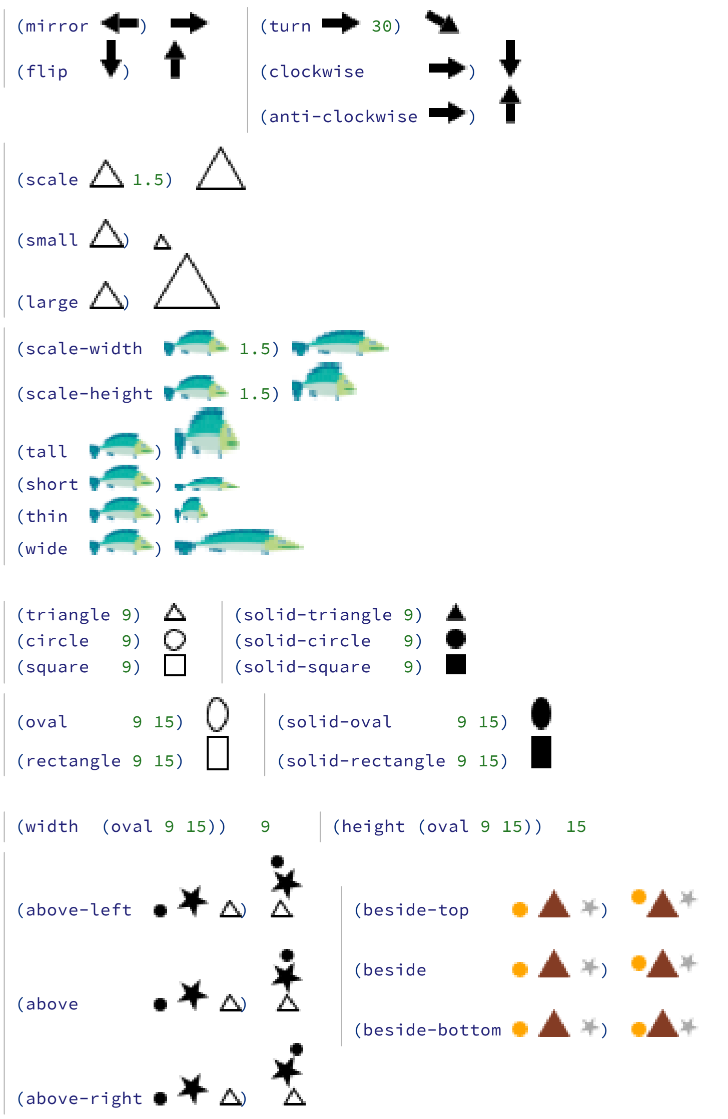
; ● Type Predicates ●

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

; ● Function Predicates ●

```
(unary?  flip)  #true      (binary? flip)   #false
```

; ● Image Functions ●



```
(mirror  )              (turn   30)
(flip  )                (clockwise   )
                        (anti-clockwise   )

(scale   1.5)
(small  )
(large  )
(scale-width   1.5)
(scale-height   1.5)
(tall  )
(short  )
(thin  )
(wide  )

(triangle 9)        (solid-triangle 9)
(circle   9)        (solid-circle   9)
(square   9)        (solid-square   9)

(oval       9 15)     (solid-oval       9 15)
(rectangle  9 15)     (solid-rectangle  9 15)

(width  (oval 9 15))   9      (height (oval 9 15))  15

(above-left   ● ★ △)           (beside-top    ● ▲ ✳)
                               (beside        ● ▲ ✳)
(above        ● ★ △)           (beside-bottom ● ▲ ✳)

(above-right  ● ★ △)
```

; ● Numeric Functions ●

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

; ● Text Functions ●

```
(text-length "one")   3
(text->image "Hi!")   Hi!
(text-join "Hi" " human!")   "Hi human!"
```

; ● List Functions ●

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

(length (list   5 #false))   3
```