

$\lambda + n$

$(\Delta (\text{valof expr env}))$

(match expr)

$[, n \# : \text{when} (\text{number? } n) \ n]$

$[, y \# : \text{when} (\text{symbol? } y) \ (\text{env } y)]$

$[(\text{if } t, c, a) \ (\text{if} (\text{valof } t \ \text{env})$

$(\text{valof } c \ \text{env})$

$(\text{valof } a \ \text{env}))]$

$[(\lambda (x) \ b)$

$(\lambda (a)$

$(\text{valof } b \ (\lambda (y) \ (\text{if} (\text{eqv? } xy)$

$(\text{env } y)))))]$

$[, \text{rator}, \ \text{rands}] \ (\text{valof rator env}) \ (\text{valof rands})]$

$> (\text{valof } ((\lambda (x) \ x) 5) \ (\lambda (y) \ 6))$

5

$\lambda + n$

$(\lambda (\text{valof expr env}))$

$(\text{match expr}$

$[\lambda, n \#:\text{when (number? n)} n]$

$[\lambda, y \#:\text{when (symbol? y)} (\text{env y})]$

$[(\text{if } t, c, a) (\text{if (valof } t \text{ env)})$

$(\text{valof } c \text{ env})$

$(\text{valof } a \text{ env})]$

$[(\lambda (x) b)$

$(\lambda (a)$

$(\text{valof } b (\lambda (y) (\text{if (eqv? xy)$

$(\text{env y})))))]$

$[\lambda, \text{rator, rand}] ((\text{valof rator env}) (\text{valof rand env}))]$

$\sum_5 (\text{valof } ((\lambda (x) x) 5) (\lambda (y) 6))$

(Δ (apply-env env f)
(match env

[(extended-env , x , a , env) (if (eq? ^a xy)
(apply-env env y))]

(else (env f))))

(Δ (extend-env X a env)
(extended-env , x , a , env))

(Δ (empty-env)
(λ (x) 0))

(Δ (apply-env env ρ)
(match env

[(extended-env , x , a , env) (if (eqv? x y)
(apply-env env ρ))]

~~(else (env ρ)))~~

(Δ (extend-env x a env)

(extended-env , x , a , env))

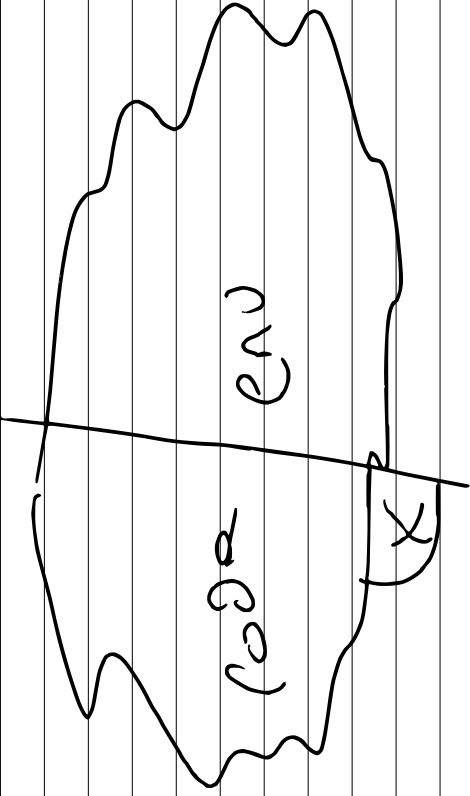
(Δ (empty-env) (empty-env))

[(empty-env) ρ]

$(\Delta (\text{extend-enu } x \text{ a enu})$
 $\quad \vee ((x, a), \text{enu}))$

ASSU

~~$(\text{next enu}$
 $\quad [x(x, a), \text{enu}]$
 $\quad [()])$~~



a closure

$(\Delta (\text{make-closure } x \ b \ \text{env}))$
 $(\text{closure } , x , b , \text{env})$

$(\Delta (\text{apply-clos } c \ a))$
 $(\text{match } c)$

$[(\text{closure } , x , b , \text{env})]$

$(\text{valueof } b (\text{extend-env } x \ a \ \text{env}))$
 $)$

$\lambda + n$

$(\Delta \text{ (valof expr env)})$

(match expr)

$[, n \# : \text{when (number? n)} n]$

$[, y \# : \text{when (symbol? (apply-env env y))}]$

$[(\text{if } t, c, a) (\text{if (valof } t \text{ env)})]$

$(\text{valof } c \text{ env})$

$(\text{valof } a \text{ env})]$

$[(\lambda(x) b) (\text{make-closure } x \text{ b env})]$

$[x, rator, rands]$

(apply-clos)

$(\text{valof rator env}) (\text{valof rands})]$

$> (\text{valof } ((\lambda(x) x) 5) (\text{empty-env}))$

(require racket/trace)

(trace-define

Dr

(Δ Cubv e) (vob? x e)

(match e

[l, y #.when (symbol? y) v ()]]

[(a (x) b) (if (vob? x b)

(union (x) (a b)) (u b u b))]

[(factor , f)]

(union (ubv factor) (ubv f))]