```
LAO: ALTURA HIL = O F

AUTURA NIL = FOLD AB O ( is red = 1+ max rim)
LA1: Vi:: ABa. Yr:.a. Yd:: ABa. altua (Bin i rd)

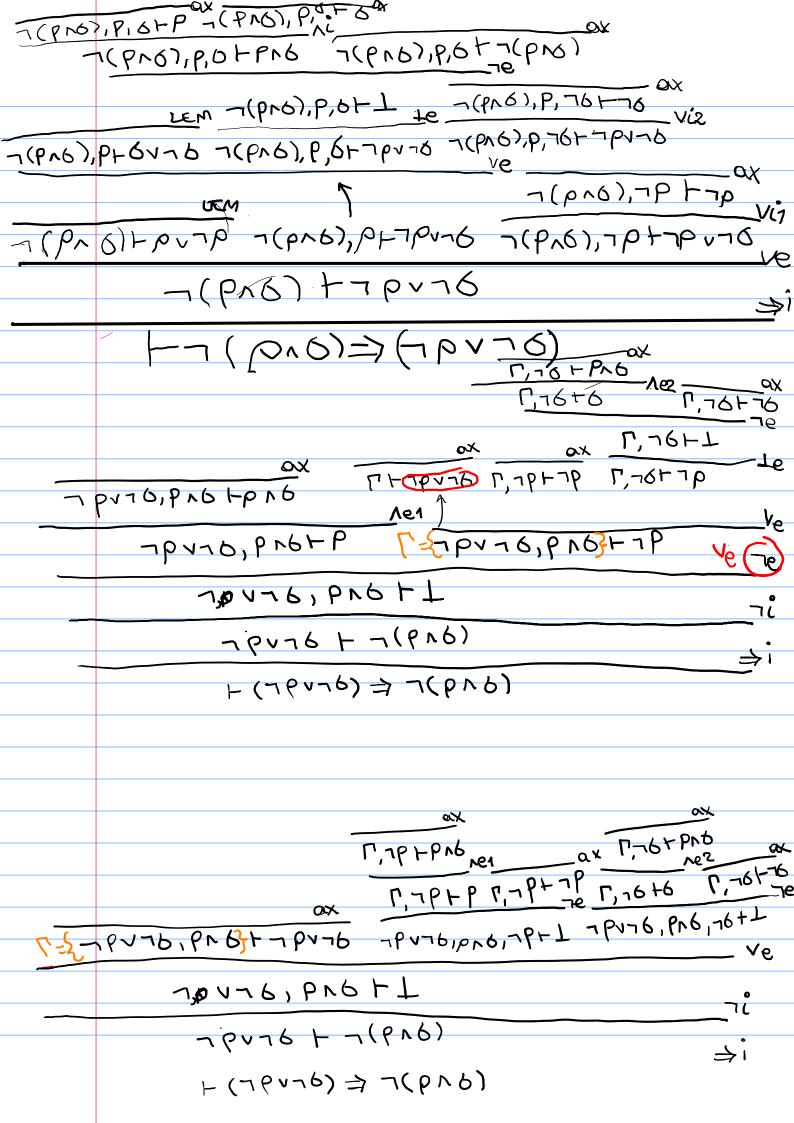
= (MBX (altura;) (altura d)

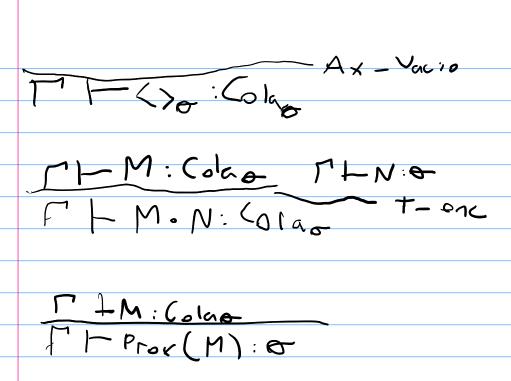
altua (Bin i rd) = F(B:n i rd) = 1
 ( ) ( x rd ) 1+ max r; xd) (F;) r (Fd) = px3
1+ max (F;) * (Fd) = 1+ max (attura;) (atturad)
( \x rd 1+ max (Fd) x rd)) r (Fd)
P(t)= altura (t) >0
P(N:1) = 2 Hua N:1>0
     altur N:1 40 0 >0 (Int)
CosaBin: P(Bin : rd) = 2 (tura (Bin : rd) >0
 Hi: P(i), P(d)
 altura (Bin i r d) 141 1+ max (altura i) (altura d) > 1+ 0=1>0
 P(+)= 4n: Int. n>0=> altura (truncac tn)=min n (alturat)
 P(Nil) = Yn: Int >0 => altura (truncar Vil n) = min n (altua Nil)
5: n < 0, Vale la=>.
& u ponemos nzo.
         altura (truncar Niln) To altura N:1 =0
         Min ( (altura Nil) = min n 0 = 0
P(Bin; rd)= n>0=> altura (truncar (Bin ird))= min n Caltura (Bin ird).
H): P(i) n P(d)
   Sin < 0 vale
 SUP. 170
    altura (truncar (Bin i rd) n)= (if n== 0 then Nil
                                       else Bin(truncar; (n-1)) r (truncar d(n-1)
for ext. Bool: n==0 =True o fake
```

```
qvq A = B
Caso N==0 = tre
Min O (altura (Bin i rd)) = O B
Caso n=0 = False

Caso n>0: (perque para n<0 ya lo vimos)

* = altura (Bin (truncar i (n-1)) r (truncar d (n-1)))
   1+max (altua (truncar i (n-1))) (altura (truncar d (n-1))) = (n>0)
   1+max (min (n-1) (altura;)) (min (n-1) (alturad)) =
  1+ min (n-1) (max (altura i) (altura d)) = min (#1-1) (1+ max (altura il'altura
min n (attura (Bin i rd)) 1
```





TI-M: (olat PHN: & PUL 7+0: &

TH Cose M OF ST-NIC-X-NO: &

desencolor (V1. V2. V3) -> desencolor (V1. V2) · V3

```
7x:B-B/+ (Af:B-B. Ax:Nat. f (f iszero(x))) x:N-B
        S = MGU_3(D \rightarrow B) \rightarrow N \rightarrow B = 
X_6 \Rightarrow X_2 \not\vdash \rightarrow \mathcal{X}_6 = \mathcal{B} \rightarrow \mathcal{B},
X_2 = N \rightarrow \mathcal{B} \not\vdash = \mathcal{X}_6 \leftarrow \mathcal{B} \rightarrow \mathcal{B}, \quad X_3 \leftarrow N \rightarrow \mathcal{B} \not\vdash
A \vdash \mathcal{A} \vdash \mathcal{B} \rightarrow \mathcal{B}, \quad \mathcal{A} \times \mathcal{A} \Rightarrow \mathcal{B} \rightarrow \mathcal{
                 H:B-B(-)x:Nat. [ (f iszero(x)): Nat-Bool
                                                                   ) f: B-B, ( + f (f iszero(x)): Bool
                                                                                                                                                                                                                                                                                                                                                                                                                     5=1(GO) X4=X3 -> X5, X4=B00(-> X3)
                                                                                                                                                                                                                                                                                                                                                                                       If:B=X3/1+ PsZero(x):X3
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   5=MGOYX2=Bool > X3/
= 3 X2 < Bool - X3/
                                                                                                                                                                                                                                                                                                                                                                                                                  x:Nat (-15Zero(x):Bool
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                S=MGU}XI=Nat(=)XI Nat(
```

|--|

V ::= ... | (eft (V) | right (V)

11-41c>V	THYCOV
$7 - left(M) \Rightarrow left(V)$	Γ r right (Υ) \hookrightarrow right (V)
M-Mcsleft(V)	7, x=V - N -> V'
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
M-M sright (V)	7,y=V - O ->V
_	
1 + Cax 11 of peft(x) 200 10 11	right(q) x y
- Zero -> = = = = = = = = = = = = = = = = = =	
r succ(tero) > succ(tero)	
)cc (50cc(200)) C> 50cc(50cc(200))	
pred(2) c> succ(zero)	X=L + x c> L
$ext(pred(2)) \hookrightarrow (ext(1))$	x = L + iszero(x) - false
e loft(pred (2)) of left x wo is zero(x	1 Kright your true con Calse
	THEN Left (V) THE CORE M of Left (X) MO N II THE CORE M of Left (X) MO N II HERO SERO SUCC(200) SUCC(200) CC (SUCC(200)) CON SUCC(200) Pred (2) CON SUCC(200)

[CBN] V ::= < ept (M), 17 > < right(M), 7 }		
THeft(4) c>		
THM S < legt(M'), T'> T, x= <m', t'=""> H N S V</m',>		
I + case M of left x no N II right y no O co V		
T-M= - T'= - T'y=		
Trase M of left xnoN right yno O co V		
Heroca Zero		
r succ(tero) > succ(tero)		
← 50CC (SUCC(SUCC(SUCC(SUCC(SUCC(SUCC(SUCC(S		
- pred(2) c> succ(zero)		
$\chi = \langle pred(2), \phi \rangle + \chi \longrightarrow \pm$		
$\nearrow \chi = \langle \operatorname{pred}(2), \varphi \rangle + \operatorname{iStero}(\chi) \Longrightarrow \text{false}$		
+ (eft (pred($\frac{2}{2}$)) \Rightarrow < left (pred($\frac{2}{2}$)), ϕ >		
+ crose logt(pred (2)) of left x no is zero(x) right y mo true co Calse		