```
chrem_exists_aux  THM

⊢  ∀r,s:ℕ⁺. CoPrime(r,s) ⇒ (∃x:ℤ. (x = 1 mod r) & (x = 0 mod s))
| by Unfold ‘eqmod‘ 0 THEN UnivCD
|
1. r : ℕ⁺
2. s : ℕ⁺
3. CoPrime(r,s)
⊢  ∃x:ℤ. r | x-1 & s | x-0
| by (FwdThru
|     Thm* ∀a,b:ℤ. CoPrime(a,b) ⟺ (∃x,y:ℤ. a•x+b•y = 1)
|     {coprime_bezout_id}
|     [3])
|    THEN
|    (ExistHD -1)
|
4. x : ℤ
5. y : ℤ
6. r•x+s•y = 1
⊢  ∃x:ℤ. r | x-1 & s | x-0  by Witness 1-r•x
|
⊢  r | 1-r•x-1 & s | 1-r•x-0  by Analyze 0
|
|\
| ⊢  r | 1-r•x-1  by ArithSimp 0
| |
| ⊢  r | -r•x
|   by Backchain
|      [Thm* ∀a,b:ℤ. a | b ⇒ a | -b    {divisor_of_minus}
|      ;Thm* ∀a,b,c:ℤ. a | b ⇒ a | b•c    {divisor_of_mul}
|      ;Thm* ∀a:ℤ. a | a    {divides_reflexivity}]
|
.\
. ⊢  s | 1-r•x-0  by (RevHypSubst 6 0) THEN (ArithSimp 0)
. |
. ⊢  s | s•y
.   by Backchain
.      [Thm* ∀a,b,c:ℤ. a | b ⇒ a | b•c    {divisor_of_mul}
.      ;Thm* ∀a:ℤ. a | a    {divides_reflexivity}]
END
```