```
chrem_exists_aux_a  THM

⊢  ∀r:ℕ+, s:{s':ℕ+| CoPrime(r,s') }.
|  ↓∃x:ℤ. ((x = 1 mod r) & (x = 0 mod s))  by UnivCD
|
1. r : ℕ+
2. s : {s':ℕ+| CoPrime(r,s') }
⊢  ↓∃x:ℤ. ((x = 1 mod r) & (x = 0 mod s))
| by Analyze 2 THEN UnhideSqStableHyp 3
|
2. s : ℕ+
3. CoPrime(r,s)
⊢  ↓∃x:ℤ. ((x = 1 mod r) & (x = 0 mod s))
| 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. ((x = 1 mod r) & (x = 0 mod s))  by Witness s·y
|
⊢  ((s·y) = 1 mod r) & ((s·y) = 0 mod s)  by RevHypSubst 6 0
|
⊢  ((s·y) = (r·x+s·y) mod r) & ((s·y) = 0 mod s)
| by Unfold `eqmod` 0 THEN Analyze 0 THEN 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 | s·y
.   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}]
END
```