```
gcd_exists  THM

⊢  ∀a,b:ℤ. ∃y:ℤ. GCD(a;b;y)  by UnivCD THEN (Decide (0≤b))
|
|\
| 1. a : ℤ
| 2. b : ℤ
| 3. 0≤b
| ⊢  ∃y:ℤ. GCD(a;b;y)
|   by BackThru Thm* ∀b:ℕ, a:ℤ. ∃y:ℤ. GCD(a;b;y)    {gcd_exists_n}
|
.\
. 1. a : ℤ
. 2. b : ℤ
. 3. ¬0≤b
. ⊢  ∃y:ℤ. GCD(a;b;y)
. | by RWH
. |    (LemmaC
. |     Thm* ∀a,b,y:ℤ. GCD(a;b;y) ⟺ GCD(a;-b;y)    {gcd_p_neg_arg_2})
. |    0
. |
. ⊢  ∃y:ℤ. GCD(a;-b;y)
.   by BackThru Thm* ∀b:ℕ, a:ℤ. ∃y:ℤ. GCD(a;b;y)    {gcd_exists_n}
END
```