```
gcd_sym  THM

⊢  ∀a,b:ℤ. gcd(a;b) ∼ gcd(b;a)  by UnivCD
|
1. a : ℤ
2. b : ℤ
⊢  gcd(a;b) ∼ gcd(b;a)
| by (Inst Thm* ∀a,b:ℤ. ∃y:ℤ. GCD(a;b;y) & gcd(a;b) = y    {gcd_elim}
|     [a;b])
|    THEN
|    (Inst Thm* ∀a,b:ℤ. ∃y:ℤ. GCD(a;b;y) & gcd(a;b) = y    {gcd_elim}
|     [b;a])
|
3. ∃y:ℤ. GCD(a;b;y) & gcd(a;b) = y
4. ∃y:ℤ. GCD(b;a;y) & gcd(b;a) = y
⊢  gcd(a;b) ∼ gcd(b;a)
| by ((New [`y2'] (Analyze 4)) THEN (New [`y1'] (Analyze 3)))
|    THEN
|    RepD
|
3. y1 : ℤ
4. GCD(a;b;y1)
5. gcd(a;b) = y1
6. y2 : ℤ
7. GCD(b;a;y2)
8. gcd(b;a) = y2
⊢  gcd(a;b) ∼ gcd(b;a)
| by (FwdThru Thm* ∀a,b,y:ℤ. GCD(a;b;y) ⇒ GCD(b;a;y)    {gcd_p_sym}
|     [7])
|    THEN
|    (FwdThru
|     Thm* ∀a,b,y1,y2:ℤ. GCD(a;b;y1) ⇒ GCD(a;b;y2) ⇒ (y1 ∼ y2)
|     {gcd_unique}
|     [4;-1])
|
9. GCD(a;b;y2)
10. y1 ∼ y2
⊢  gcd(a;b) ∼ gcd(b;a)  by RelRST
END
```