```
coprime_divisors_prod  THM

⊢  ∀a1,a2,b:ℤ. CoPrime(a1,a2) ⇒ a1 | b ⇒ a2 | b ⇒ a1·a2 | b
| by UnivCD
|
1. a1 : ℤ
2. a2 : ℤ
3. b : ℤ
4. CoPrime(a1,a2)
5. a1 | b
6. a2 | b
⊢  a1·a2 | b
| by (FwdThru
|     Thm* ∀a,b:ℤ. CoPrime(a,b) ⟺ (∃x,y:ℤ. a·x+b·y = 1)
|     {coprime_bezout_id}
|     [4])
|    THEN
|    (Thin 4)
|
4. a1 | b
5. a2 | b
6. ∃x,y:ℤ. a1·x+a2·y = 1
⊢  a1·a2 | b  by Analyze 6 THEN Analyze 7
|
6. x : ℤ
7. y : ℤ
8. a1·x+a2·y = 1
⊢  a1·a2 | b
| by New [`c2'] (Analyze 5) THEN New [`c1'] (Analyze 4)
|    THEN
|    UnfoldTopAb 0
|
4. c1 : ℤ
5. b = a1·c1
6. c2 : ℤ
7. b = a2·c2
8. x : ℤ
9. y : ℤ
10. a1·x+a2·y = 1
⊢  ∃c:ℤ. b = a1·a2·c
| by (Using [`n',b]
|     (FwdThru Thm* ∀a,b,n:ℤ. a = b ⇒ n·a = n·b    {mul_preserves_eq}
|      [10]))
|    THEN
|    (Thin 10)
|    THEN
|    (ArithSimp 10)
|
10. a1·b·x+a2·b·y = b
⊢  ∃c:ℤ. b = a1·a2·c
| by Rewrite (NthC 1 (HypC 7) THENC NthC 1 (HypC 5)) 10
|
10. a1·a2·c2·x+a2·a1·c1·y = b
⊢  ∃c:ℤ. b = a1·a2·c  by Witness c2·x+c1·y
END
```