```
nat_prod_one_iff_factors_one  THM

⊢  ∀x,y:ℕ. x·y = 1 ⟺ x = 1 & y = 1
| by ∀x,y:ℕ. x·y = 1 ⇒ y = 1  Asserted
|
|\
| 1. x : ℕ
| 2. y : ℕ
| 3. x·y = 1
| ⊢  y = 1
| | by Inst: Thm*  ∀a,b:ℤ. ¬a·b = 0 ⇒ ¬a = 0 & ¬b = 0    {zero_ann_b}
| |    Using:[x | y]
| |
| 4. ¬x = 0
| 5. ¬y = 0
| ⊢  y = 1
| | by Inst: Thm*  ∀a,b:ℤ, n:ℕ+. n·a≤n·b ⇒ a≤b    {mul_cancel_in_le}
| |    Using:[y | 1 | x]
| |
| 6. y≤1
| ⊢  y = 1  by Auto
|
|\
| 1. ∀x,y:ℕ. x·y = 1 ⇒ y = 1
| 2. x : ℕ
| 3. y : ℕ
| 4. x·y = 1
| ⊢  x = 1  by FwdThru: Hyp:1 on [ y·x = 1 ]
|
|\
| 1. ∀x,y:ℕ. x·y = 1 ⇒ y = 1
| 2. x : ℕ
| 3. y : ℕ
| 4. x·y = 1
| ⊢  y = 1  by FwdThru: Hyp:1 on [ x·y = 1 ]
|
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. 1. ∀x,y:ℕ. x·y = 1 ⇒ y = 1
. 2. x : ℕ
. 3. y : ℕ
. 4. x = 1
. 5. y = 1
. ⊢  x·y = 1  by Rewrite by x = 1
END
```