```
prime_nat_divby_self_only  THM

⊢  ∀x:{2...}, y:ℕ. prime(y) ⇒ x | y ⇒ x = y ∈ ℤ  by Auto
|
1. x : {2...}
2. y : ℕ
3. prime(y)
4. x | y
⊢  x = y
| by Rewrite'4 by
|    Thm*  ∀a,b:ℕ. a | b ⟺ (∃c:ℕ. b = a·c)
|    {divides_def_on_nat} ...ℕ
|    THEN
|    Analyze-1
|
4. c : ℕ
5. y = x·c
⊢  x = y
| by Rewrite'3 by
|    Thm*  ∀x:ℕ. prime(x) ⟺ 2≤x & ¬(∃i:{2..x^-}. i | x)
|    {prime_nat} ...ℕ
|
3. 2≤y
4. ¬(∃i:{2..y^-}. i | y)
5. c : ℕ
6. y = x·c
⊢  x = y  by Rewrite'-1 by c = 1 ...ℕ
|
.....assertion .....
⊢  c = 1  by 0<c & ¬2≤c  Asserted ...ℕ
|
|\
| ⊢  0<c
|   by Guarding (<prop> & <prop>)
|      FwdThru:
|      Thm*  ∀a,b:ℕ. 0<a·b ⟺ 0<a & 0<b    {pos_mul_arg_boundsNat}
|      on [ 0<x·c ] ...ℕ
|
.\
. ⊢  ¬2≤c  by SimilarTo: Hyp:4 ...wℕ
. |
. 7. 2≤c
. ⊢  ∃i:{2..y^-}. i | y  by Witness: x ...ℕ
. |
. |\
. | .....wf .....
. | ⊢  x ∈ {2..y^-}  by Analyze ...ℕ
. | |
. | ⊢  x<y  by Rewrite by Hyp:6 ...ℕ
. | |
. | ⊢  x<x·c
. |   by Inst: Thm*  ∀i:{2...}, j:ℕ^+. j<i·j    {factor_smaller2}
. |      Using:[c | x] ...ℕ
. |
. .\
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. . ⊢  x | y  by Witness: c ...ℕ
END
```