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hanoi_seq_permutepegs  THM

⊢  ∀n:ℕ, a,z:ℤ, s:({a...z}→{1...n}→Peg).
|  s is a Hanoi(n disk) seq on a..z
|  ⇒
|  (∀f:(Peg→Peg).
|   Inj(Peg; Peg; f)
|   ⇒
|   (λx,i. f(s(x,i))) is a Hanoi(n disk) seq on a..z)  by Auto
|
1. n : ℕ
2. a : ℤ
3. z : ℤ
4. s : {a...z}→{1...n}→Peg
5. s is a Hanoi(n disk) seq on a..z
6. f : Peg→Peg
7. Inj(Peg; Peg; f)
⊢  (λx,i. f(s(x,i))) is a Hanoi(n disk) seq on a..z
| by (λx,i. f(s(x,i))) ∈ {a...z}→{1...n}→Peg  Asserted
|    THEN
|    SimilarTo Hyp:5 THEN Reduce Concl
|
8. (λx,i. f(s(x,i))) ∈ {a...z}→{1...n}→Peg
9. x : {a...z}
10. x' : {a...z}
11. x+1 = x'
12. k : {1...n}
13. Moving disk k of n takes s(x) to s(x')
⊢  Moving disk k of n takes λi.f(s(x,i)) to λi.f(s(x',i))
| by SimilarTo Hyp:-1 THEN OnAllClauses Reduce
|
|\
| 13. i : {1...n}
| 14. f(s(x,i)) = f(s(x',i))
| ⊢  s(x,i) = s(x',i)  by BackThru: Inj(Peg; Peg; f)
|
|\
| 13. i : {1...n}
| 14. i ≠ k
| 15. s(x,i) = s(x',i)
| ⊢  f(s(x,i)) = f(s(x',i))  by Analyze
|
|\
| 13. i : {1...k-1}
| 14. f(s(x,i)) = f(s(x,k))
| ⊢  s(x,i) = s(x,k)  by BackThru: Inj(Peg; Peg; f)
|
.\
. 13. i : {1...k-1}
. 14. f(s(x',i)) = f(s(x',k))
. ⊢  s(x',i) = s(x',k)  by BackThru: Inj(Peg; Peg; f)
END
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