```
fin_dist_func  THM

⊢  Fin(St) ⇒ (∃eq:(St→St→𝔹). ∀x,y:St. eq(x,y) ⇒ x = y)  by RepD
|
1. St : Type
2. Fin(St)
⊢  ∃eq:(St→St→𝔹). ∀x,y:St. eq(x,y) ⇒ x = y  by Analyze 2
|
2. n : ℕ
3. ∃f:(ℕn→St). Bij(ℕn; St; f)
⊢
| by RWH
|    (LemmaC
|     Thm* (∃f:(A→B). Bij(A; B; f)) ⟺ (A ∼ B)    {bij_iff_1_1_corr})
|    3
|
3. ℕn ∼ St
⊢   by Analyze -1 THEN Analyze -1
|
3. f : ℕn→St
4. g : St→ℕn
5. InvFuns(ℕn; St; f; g)
⊢   by InstConcl [λx,y. g(x)=₂g(y)]
|
⊢  ∀x,y:St. (λx,y. g(x)=₂g(y))(x,y) ⇒ x = y  by Reduce 0 THEN RepD
|
6. x : St
7. y : St
8. g(x)=₂g(y)
⊢  x = y  by RW bool_to_propC -1
|
8. g(x) = g(y)
⊢   by Assert (f(g(x)) = f(g(y)))
|
|\
| .....assertion .....
| ⊢  f(g(x)) = f(g(y))  by Assert (g(x) = g(y))
| |
| |\
| | .....assertion .....
| | ⊢  g(x) = g(y)  by Auto
| |
| .\
| . 9. g(x) = g(y)
| . ⊢   by RWH (HypC 9) 0
|
.\
. 9. f(g(x)) = f(g(y))
. ⊢   by Thin 8 THEN Analyze 5
. |
. 5. g o f = Id
. 6. f o g = Id
. 7. x : St
. 8. y : St
. 9. f(g(x)) = f(g(y))
```

```
. ⊢   by Assert ((f o g)(x) = (f o g)(y))
. |
. |\
. | .....assertion .....
. | ⊢  (f o g)(x) = (f o g)(y)  by Reduce 0
. |
. .\
. . 10. (f o g)(x) = (f o g)(y)
. . ⊢   by RWH (HypC 6) 10
. . |
. . 10. Id(x) = Id(y)
. . ⊢   by Reduce -1 THEN NthHyp -1
END
```