```
fin_is_decid  THM

⊢  Fin(T) ⇒ (∀x,y:T. Dec(x = y))  by UnivCD
|
1. T : Type
2. Fin(T)
3. x : T
4. y : T
⊢  Dec(x = y)  by Analyze 2
|
2. n : ℕ
3. ∃f:(ℕn→T). Bij(ℕn; T; f)
4. x : T
5. y : T
⊢   by Analyze 3
|
3. f : ℕn→T
4. Bij(ℕn; T; f)
5. x : T
6. y : T
⊢   by Analyze 4
|
4. Inj(ℕn; T; f)
5. Surj(ℕn; T; f)
6. x : T
7. y : T
⊢   by Unfold ‘inject‘ 4
|
4. ∀a1,a2:ℕn. f(a1) = f(a2) ⇒ a1 = a2
5. Surj(ℕn; T; f)
6. x : T
7. y : T
⊢   by Unfold ‘surject‘ 5
|
5. ∀b:T. ∃a:ℕn. f(a) = b
6. x : T
7. y : T
⊢   by InstHyp [x] 5
|
8. ∃a:ℕn. f(a) = x
⊢   by Analyze 8
|
8. a : ℕn
9. f(a) = x
⊢   by Witness5 y
|
5. x : T
6. y : T
7. a : ℕn
8. f(a) = x
9. ∃a:ℕn. f(a) = y
⊢   by Analyze 9
|
9. a1 : ℕn
10. f(a1) = y
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```
⊢   by Decide (a = a1)
|
|\
| 11. a = a1
| ⊢   by ApFunToHypEquands ‘i’ (f(i)) T 11
| |
| 12. f(a) = f(a1)
| ⊢   by RWH (HypC 8) 12
| |
| 12. x = f(a1)
| ⊢   by RWH (HypC 10) 12
| |
| 12. x = y
| ⊢   by Unfold ‘decidable‘ 0
| |
| ⊢  x = y ∨ ¬x = y  by Sel 1 (Analyze 0)
|
.\
. 11. ¬a = a1
. ⊢   by Unfold ‘decidable‘ 0
. |
. ⊢  x = y ∨ ¬x = y  by Sel 2 (Analyze 0)
. |
. ⊢  ¬x = y  by Analyze 0
. |
. 12. x = y
. ⊢  False  by RWH (RevHypC 8) 12
. |
. 12. f(a) = y
. ⊢   by RWH (RevHypC 10) 12
. |
. 12. f(a) = f(a1)
. ⊢   by InstHyp [a;a1] 4
END
```