

Inference at * 1 0
of proof for Lemma connex_functionality_wrt_iff:

```

1. T : Type
2. R : T→T→ ℙ
3. R' : T→T→ ℙ
4. ∀x, y:T. R(x,y) ⇐⇒ R'(x,y)
⊢ (∀x, y:T. R(x,y) ∨ R(y,x)) ⇐⇒ (∀x, y:T. R'(x,y) ∨ R'(y,x))
  by PERMUTE{1:n,
              2:n,
              2:n,
              2:n,
              3:n,
              3:n,
              4:n,
              5:n,
              6:n,
              7:n,
              7:n,
              8:n,
              9:n,
              10:n,
              11:n,
              12:n,
              13:n,
              14:n,
              15:n,
              16:n,
              16:n,
              15:n,
              7:n,
              3:n,
              17:n,
              18:n}

```

1:wf..... NILNIL

⊢ (∀x, y:T. R(x,y) ∨ R(y,x)) ∈ ℙ

2:wf..... NILNIL

⊢ (∀x, y:T. R'(x,y) ∨ R'(y,x)) ∈ ℙ

3:wf..... NILNIL

⊢ T ∈ Type

4:wf..... NILNIL

$\vdash (\lambda x.\forall y:T. R(x,y) \vee R(y,x)) \in T \rightarrow \mathbb{P}$

5:wf..... NILNIL

$\vdash (\lambda x.\forall y:T. R'(x,y) \vee R'(y,x)) \in T \rightarrow \mathbb{P}$

6:wf..... NILNIL

$\vdash T = T$

7:wf..... NILNIL

5. T

$\vdash T \in \text{Type}$

8:wf..... NILNIL

5. $x : T$

$\vdash (\lambda y.R(x,y) \vee R(y,x)) \in T \rightarrow \mathbb{P}$

9:wf..... NILNIL

5. $x : T$

$\vdash (\lambda y.R'(x,y) \vee R'(y,x)) \in T \rightarrow \mathbb{P}$

10:wf..... NILNIL

5. T

$\vdash T = T$

11:wf..... NILNIL

5. $x : T$

6. $y : T$

$\vdash R(x,y) \in \mathbb{P}$

12:wf..... NILNIL

5. $x : T$

6. $y : T$

$\vdash R'(x,y) \in \mathbb{P}$

13:wf..... NILNIL

5. $x : T$

6. $y : T$

$\vdash R(y,x) \in \mathbb{P}$

14:wf..... NILNIL

5. $x : T$

6. $y : T$

$\vdash R'(y,x) \in \mathbb{P}$

15:wf..... NILNIL

5. $x : T$
 6. T
 $\vdash x \in T$
 16:wf..... NILNIL

5. T
 6. $y : T$
 $\vdash y \in T$
 17:wf..... NILNIL

$\vdash (\forall x, y:T. R'(x,y) \vee R'(y,x)) = (\forall x, y:T. R'(x,y) \vee R'(y,x))$
 18:

$\vdash (\forall x, y:T. R'(x,y) \vee R'(y,x)) \iff (\forall x, y:T. R'(x,y) \vee R'(y,x))$
 .