```
mem_append  THM

⊢  ∀L1,L2:T*, t:T. mem_f(T;t;L1 @ L2) ⟺ mem_f(T;t;L1) ∨ mem_f(T;t;L2)
| by RepD THEN (ListInd 2) THEN (Reduce 0) THEN GenExRepD
|    THEN
|    (Try ProveProp)
|
|\
| 1. T : Type
| 2. T*
| 3. L2 : T*
| 4. t : T
| 5. u : T
| 6. v : T*
| 7. mem_f(T;t;v @ L2) ⇒ mem_f(T;t;v) ∨ mem_f(T;t;L2)
| 8. mem_f(T;t;v @ L2) ⇐ (mem_f(T;t;v) ∨ mem_f(T;t;L2))
| 9. mem_f(T;t;v @ L2)
| ⊢  u = t ∨ mem_f(T;t;v) ∨ mem_f(T;t;L2)
|   by (FwdThru 7 [-1]) THEN ProveProp
|
|\
| 1. T : Type
| 2. T*
| 3. L2 : T*
| 4. t : T
| 5. u : T
| 6. v : T*
| 7. mem_f(T;t;v @ L2) ⇒ mem_f(T;t;v) ∨ mem_f(T;t;L2)
| 8. mem_f(T;t;v @ L2) ⇐ (mem_f(T;t;v) ∨ mem_f(T;t;L2))
| 9. mem_f(T;t;v)
| ⊢  u = t ∨ mem_f(T;t;v @ L2)
|   by (Sel 2 (Analyze 0)) THEN (BackThru 8) THEN ProveProp
|
.\
. 1. T : Type
. 2. T*
. 3. L2 : T*
. 4. t : T
. 5. u : T
. 6. v : T*
. 7. mem_f(T;t;v @ L2) ⇒ mem_f(T;t;v) ∨ mem_f(T;t;L2)
. 8. mem_f(T;t;v @ L2) ⇐ (mem_f(T;t;v) ∨ mem_f(T;t;L2))
. 9. mem_f(T;t;L2)
. ⊢  u = t ∨ mem_f(T;t;v @ L2)
.   by (Sel 2 (Analyze 0)) THEN (BackThru 8) THEN ProveProp
END
```