```
list_length_wf_int  THM

⊢  ∀T:Type. |•| ∈ (T List)→ℤ  by Analyze 0
|
1. T : Type
⊢  |•| ∈ (T List)→ℤ
| by Repeat
|    (Unfolds [‘list_length‘;‘letrec‘;‘letrec_body‘;‘letrec_arg‘] 0)
|
⊢  Y(λl,L. Case of L; nil → 0 ; h.t → 1+l(t)) ∈ (T List)→ℤ
| by RWH YUnrollC 0 THEN Reduce 0
|
⊢  (λL.Case of L
|       nil → 0
|       h.t → 1+Y((λl,L. Case of L; nil → 0 ; h.t → 1+l(t)),t))
|  ∈ (T List)→ℤ  by MemberEqCD
|
2. L : T List
⊢  (Case of L
|     nil → 0
|     h.t → 1+Y((λl,L. Case of L; nil → 0 ; h.t → 1+l(t)),t))
|  ∈ ℤ  by ListInd 2 THEN Reduce 0
|
|\
| ⊢  0 ∈ ℤ  by Auto
|
.\
. 3. T
. 4. v : T List
. 5. (Case of v
. |     nil → 0
. |     h.t → 1+Y((λl,L. Case of L; nil → 0 ; h.t → 1+l(t)),t))
. |  ∈ ℤ
. ⊢  1+Y((λl,L. Case of L; nil → 0 ; h.t → 1+l(t)),v) ∈ ℤ
. | by RWH YUnrollC 0 THEN Reduce 0
. |
. ⊢  1+(Case of v
.         nil → 0
.         h.t → 1+Y((λl,L. Case of L; nil → 0 ; h.t → 1+l(t)),t))
.    ∈ ℤ  by Auto
END
```