```
formula_or_left_sat  THM

⊢  ∀concl,M,N:Formula List, q,r:Formula, a:Assignment.
|  a |= <q.(M @ N),concl> & a |= <r.(M @ N),concl>
|  ⟺
|  a |= <M @ (q⌈∨⌉r.N),concl>  by UnivCD
|
1. concl : Formula List
2. M : Formula List
3. N : Formula List
4. q : Formula
5. r : Formula
6. a : Assignment
⊢  a |= <q.(M @ N),concl> & a |= <r.(M @ N),concl>
|  ⟺
|  a |= <M @ (q⌈∨⌉r.N),concl>
| by Rewrite
|    (UnfoldC `sequent_satisfiable` THENC AbReduceC
|     THENC
|     HigherC
|     (LemmaC
|      Thm* ∀P:(T→Prop), L,M:T List.
|           ∃x∈(L @ M).P(x) ⟺ ∃x∈L.P(x) ∨ ∃x∈M.P(x)
|      {list_exists_append_lemma})
|     THENC
|     AbReduceC
|     THENC
|     HigherC
|     (LemmaC
|      Thm* ∀a:Assignment, q,r:Formula. a |≠ q⌈∨⌉r ⟺ a |≠ q & a |≠ r
|      {formula_or_falsifiable_lemma}))
|    0
|
⊢  a |≠ q ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|  & a |≠ r ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|  ⟺
|  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
| by Repeat (Analyze 0)
|    THEN
|    OnHyps [-2;-1;-1]
|    (λi.RepeatOrHD i THEN RepeatAndHD i THEN RepeatOrHD i)
|
|\
| 7. a |≠ q
| 8. a |≠ r
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;1]
|
|\
| 7. a |≠ q
| 8. ∃F∈M.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
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| 7. a |≠ q
| 8. ∃F∈N.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;2] THEN Trivial
|
|\
| 7. a |≠ q
| 8. ∃F∈concl.a |= F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
|\
| 7. ∃F∈M.a |≠ F
| 8. a |≠ r
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
|
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| 7. ∃F∈M.a |≠ F
| 8. ∃F∈M.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
|
|\
| 7. ∃F∈M.a |≠ F
| 8. ∃F∈N.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
|
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| 7. ∃F∈M.a |≠ F
| 8. ∃F∈concl.a |= F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
|\
| 7. ∃F∈N.a |≠ F
| 8. a |≠ r
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;2] THEN Trivial
|
|\
| 7. ∃F∈N.a |≠ F
| 8. ∃F∈M.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
|
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| 7. ∃F∈N.a |≠ F
| 8. ∃F∈N.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;2] THEN Trivial
|
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| 7. ∃F∈N.a |≠ F
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| 8. ∃F∈concl.a |= F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
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| 7. ∃F∈concl.a |= F
| 8. a |≠ r
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
|\
| 7. ∃F∈concl.a |= F
| 8. ∃F∈M.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
|\
| 7. ∃F∈concl.a |= F
| 8. ∃F∈N.a |≠ F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
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| 7. ∃F∈concl.a |= F
| 8. ∃F∈concl.a |= F
| ⊢  ∃F∈M.a |≠ F ∨ a |≠ q & a |≠ r ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
|\
| 7. ∃F∈M.a |≠ F
| ⊢  a |≠ q ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;1] THEN Trivial
|
|\
| 7. a |≠ q
| 8. a |≠ r
| ⊢  a |≠ q ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
|
|\
| 7. ∃F∈N.a |≠ F
| ⊢  a |≠ q ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;2] THEN Trivial
|
|\
| 7. ∃F∈concl.a |= F
| ⊢  a |≠ q ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [2] THEN Trivial
|
|\
| 7. ∃F∈M.a |≠ F
| ⊢  a |≠ r ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;1] THEN Trivial
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| 7. a |≠ q
| 8. a |≠ r
| ⊢  a |≠ r ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;1] THEN Trivial
|
|\
| 7. ∃F∈N.a |≠ F
| ⊢  a |≠ r ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
|   by Choose [1;2;2] THEN Trivial
|
.\
. 7. ∃F∈concl.a |= F
. ⊢  a |≠ r ∨ ∃F∈M.a |≠ F ∨ ∃F∈N.a |≠ F ∨ ∃F∈concl.a |= F
.   by Choose [2] THEN Trivial
END
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