





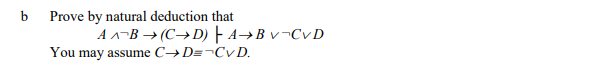
Since both have for-all quantifiers on the outside, it is sufficient to prove for some arbitrary constant *a*

This shows that these statements are not equivalent. An example would be for a instance *a* such that:

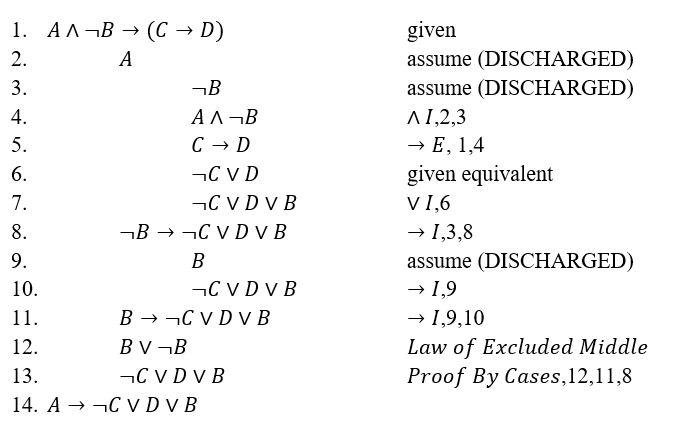
Clearly, the first statement then holds:

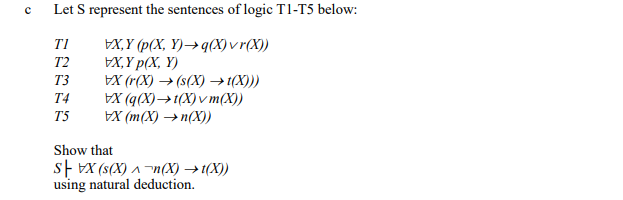
And second does not:

Hence, two statements are not the same since

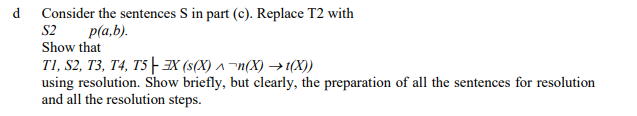


1. ~~given~~
2. ~~assume (DISCHARGED)~~
3. ~~assume (DISCHARGED)~~
4. ~~,2,3~~
5. ~~, 1,4~~
6. ~~given equivalent~~
7. ~~`~~  ~~,3,6~~
8. ~~assume (DISCHARGED)~~
9. ~~,7~~
11. ~~Law of Excluded Middle~~
12. ~~Proof by cases, 7,10,11~~
14. ~~,2,13~~





1. given givcen
2. given
3. give
4. ∀𝑋(𝑞(𝑋)→𝑡(𝑋)∨𝑚(𝑋))∀XqX→tX∨mX given
5. assume (DISCHARGED)
6. , 2
7. ,,1,7
8. assume (DISCHARGED)
9. ,4,9
10. assume (DISCHARGED)
11. , 4,11
12. , 5
13. RAA, 11,12,13 (DISCHARGED)
14. ,10,14
16. assume (DISCHARGED)
17. ,3,17
18. ,6
19. 18,19
20. ,17,20
21. proof by cases, 8,16,21
22. ,6,22
23. ,23



1. Convert all sentences into CNF

T1:

S2: (a,b)

T3:

T4:

T5:

1. Rename the variables uniquely and drop universal quantifiers

T1:

S2:

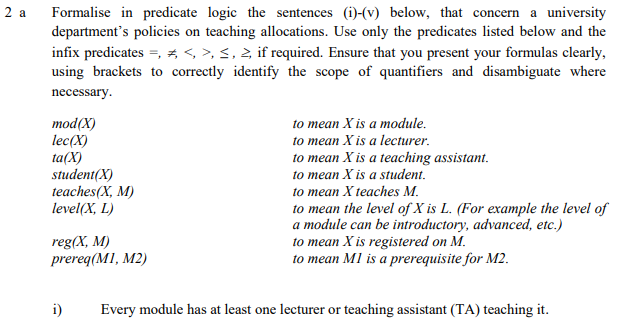
T3:

T4:

T5:

1. Negate the conclusion and convert to CNF
2. Derive an inconsistency

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First, formalise: “No lecturer teaches more than one advanced module”:

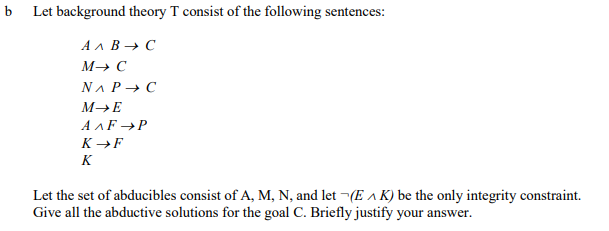
Next, formalise: “Some Tas teach more than one module at any one level”:

These two sentences must then by connected by a conjunction ().









1. Convert all background theory to CNF
2. Convert integrity constraint to CNF
3. Negate conclusion and convert to CNF

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Need to check integrity constraints here.

M -> E, and since K is in T, the first solution does not work.