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1 / $\forall x (\neg P(x) \rightarrow Q(x) \wedge R(x)$ premise

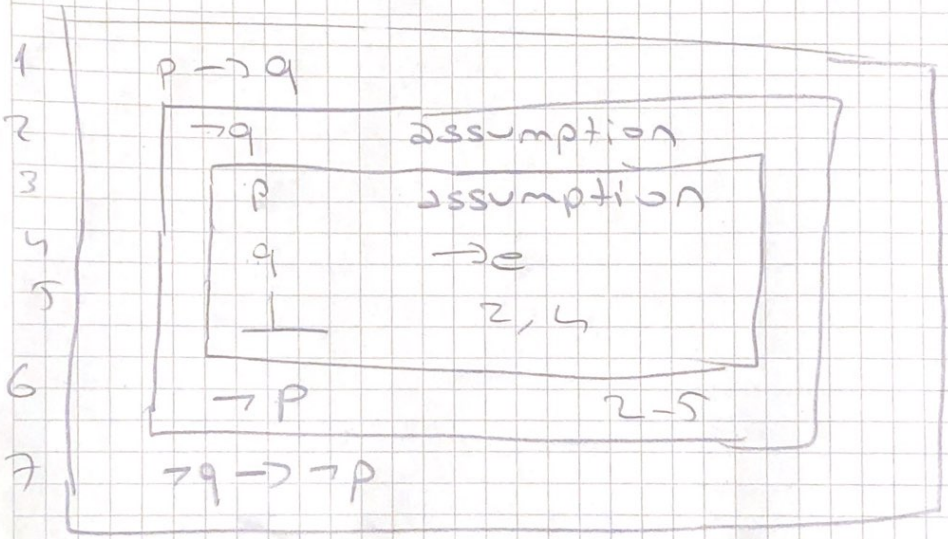
2 / $\forall x (\neg Q(x) \vee \neg R(x) \rightarrow P(x)$ i, $\wedge$P, de morgan

3 $\exists x (\neg Q(x) \vee \neg R(x) \rightarrow P(x)$ $\forall$e

4 / $\exists y (\neg R(y) \vee \neg Q(y))$ premise

5 / $\exists z P(z)$ 2,3, $\rightarrow$e, $\exists$i

lemma MP:



GIPTA

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lemma De Morgan:

1 ¬(p ∧ q)

2 ¬(¬p ∨ ¬q) assump

3 ¬p assump

4 ¬p ∨ ¬q ∨i

5 ⊥

6 p 3-5

7 ¬q assump

8 ¬q ∨ ¬p ∨i

9 ⊥ 8, 2

10 q 7-9

11 p ∧ q ∧i, 2 9

12 ⊥

13 ¬p ∨ ¬q