

We have the following knowledge base:

- $\neg Student(X) \vee Studies(X)$
- $\neg Studies(X) \vee PassExams(X)$
- $Student(Elena)$

Prove that Elena passes her exams, i.e.,  $PassExams(Elena)$ .

- i. What is the first step of resolution-refutation?

Add negated goal:  $\neg PassExams(Elena)$

- ii. Clearly list the steps in the resolution refutation proof, the clauses used, and the resolution, along with any variable substitutions, etc.

1.  $\neg Student(X) \vee Studies(X)$
2.  $\neg Studies(X) \vee PassExams(X)$
3.  $Student(Elena)$

4.  $\neg PassExams(Elena)$       Negated goal
5.  $\neg Studies(Elena)$       (2) & (4),  $X \setminus Elena$
6.  $\neg Student(Elena)$       (1) & (5),  $X \setminus Elena$
7.  $False$       (3) & (6)

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