

Unsatisfiability

1

Demonstrating Unsatisfiability

Start with premises.

Apply resolution repeatedly.

If empty clause generated, the original set is unsatisfiable.

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Example

- | | | |
|----|-------------------------|---------|
| 1. | $\{p(a,b), q(a,c)\}$ | Premise |
| 2. | $\{\neg p(x,y), r(x)\}$ | Premise |
| 3. | $\{\neg q(x,y), r(x)\}$ | Premise |
| 4. | $\{\neg r(z)\}$ | Premise |

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Example

- | | | |
|----|-------------------------|---------|
| 1. | $\{p(a,b), q(a,c)\}$ | Premise |
| 2. | $\{\neg p(x,y), r(x)\}$ | Premise |
| 3. | $\{\neg q(x,y), r(x)\}$ | Premise |
| 4. | $\{\neg r(z)\}$ | Premise |
| 5. | $\{q(a,c), r(a)\}$ | 1, 2 |

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Example

1.	$\{p(a,b), q(a,c)\}$	Premise
2.	$\{\neg p(x,y), r(x)\}$	Premise
3.	$\{\neg q(x,y), r(x)\}$	Premise
4.	$\{\neg r(z)\}$	Premise
5.	$\{q(a,c), r(a)\}$	1, 2
6.	$\{r(a)\}$	5, 3

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Example

1.	$\{p(a,b), q(a,c)\}$	Premise
2.	$\{\neg p(x,y), r(x)\}$	Premise
3.	$\{\neg q(x,y), r(x)\}$	Premise
4.	$\{\neg r(z)\}$	Premise
5.	$\{q(a,c), r(a)\}$	1, 2
6.	$\{r(a)\}$	5, 3
7.	$\{\}$	6, 4

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