

Prove that the conclusion  $(A \Rightarrow D) \vee (C \Rightarrow B)$  follows from the premise  $(A \Rightarrow B) \vee (C \Rightarrow D)$ . First convert the premises and the negation of the conclusion into Conjunctive Normal Form, and then employ a resolution proof to get a contradiction.

$$(A \Rightarrow B) \vee (C \Rightarrow D)$$

$$\sim A \vee B \vee \sim C \vee D$$

$$\sim ((A \Rightarrow D) \vee (C \Rightarrow B))$$

$$\sim (A \Rightarrow D) \wedge \sim (C \Rightarrow B)$$

$$\sim (\sim A \vee D) \wedge \sim (\sim C \vee B)$$

$$(A \wedge \sim D) \wedge (C \wedge \sim B)$$

1. $\sim A \vee B \vee \sim C \vee D$	P
2. $A$	P
3. $\sim D$	P
4. $C$	P
5. $\sim B$	P
6. $B \vee \sim C \vee D$	Res (1), (2)
7. $\sim C \vee D$	Res (5), (6)
8. $D$	Res (4), (7)
9. <i>false</i>	Conj. (3), (8)