Resolution

\[ X \lor R \quad \neg R \lor Y \]

\[ X \lor Y \]

This rule is **sound**:

if a valuation satisfies both **premises**
then it satisfies the **conclusion**

if a valuation falsifies the **conclusion**
then it falsifies one of the **premises**
Resolution on A

If \( \neg A \) occurs in 3 clauses

If \( \neg A \) occurs in 3 clauses

and A occurs in 2 clauses

and A occurs in 2 clauses

We have \( 2 \times 3 = 6 \) opportunities for resolution

- \( \neg A, X0 \)
- \( \neg A, X1 \)
- \( \neg A, X2 \)
- \( A, Y0 \)
- \( A, Y1 \)
- \( \neg B, D \)
- \( \neg E, B \)
- \( X0, Y0 \)
- \( X0, Y1 \)
- \( X1, Y0 \)
- \( X1, Y1 \)
- \( X2, Y0 \)
- \( X2, Y1 \)
Making progress

If we can satisfy all clauses in this set then we can satisfy all clauses in this set.
Making progress

If we can satisfy all clauses in these two sets

then we can satisfy all clauses in these two sets

If we can satisfy all clauses in these two sets
Making progress

If we can satisfy all clauses in this set, we can satisfy all clauses in this set, so we can forget them.

These are carried forward.

If we can satisfy all clauses in this set.