Tseitin's Polytime Transformation to CNF.

assume our formula is in NNF (negation normal form), where all negations are pushed invards using De Morgan laws & double negation law.

For every sub-formula B of A, let P_B denote B if B is a literal and a new atom if B is not a literal.

CNF (A) includes:

the "top" clause (P_A)

and, for each sub-formula

B of A: $(A \to B) \equiv (\neg A \vee B)$

1. If B is $(C \vee D)$, include the clauses for $(P_B \leftrightarrow (P_C \vee P_D))$

$(\neg P_B \vee P_C \vee P_D)$, $(\neg P_C \vee P_B)$ $(\neg P_D \vee P_B)$

2. If B is $(C \wedge D)$, include the clauses for $(P_B \leftrightarrow (P_C \wedge P_D))$

$(\neg P_B \vee P_C)$ $(\neg P_B \vee P_D)$ $(\neg P_C \vee \neg P_D \vee P_B)$

Th Every t.a. that sat. CNF(A), sat. A.,

Every t.a that sat A can be extended to the one that sat. CNF(A)

Ex. $A := ((\underbrace{Q \wedge R}_{X}) \wedge (\underbrace{Q \wedge S}_{Y}))$

CNF(A):

$$(P_A) \wedge (\underline{P_A \leftrightarrow P_X \wedge P_Y}) \wedge$$

$$(\underline{P_X \leftrightarrow (P_Q \wedge P_R)}) \wedge (\underline{P_Y \leftrightarrow (P_Q \wedge P_S)})$$

rewrite in clausal form

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CNF(A):

$(P_A) \wedge (\underline{P_A \leftrightarrow P_X \wedge P_Y}) \wedge$

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rewrite in clausal form