CNF · SAT

Anatoly Weinstein

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TODO A CNF-SAT is an equation …

1 Equations

Set Notation · CNF	$\{\{a,\overline{b}\},\{b,\overline{c},\overline{d}\},\{\overline{a},\overline{c}\}\}$
Arithmetic · CNF	$(a+\overline{b})\cdot(b+\overline{c}+\overline{d})\cdot(\overline{a}+\overline{c})$
Negated · DNF	$\neg(ab+\overline{b}cd+ac)$

Formulas

Zugzwang. If a disjunction consists of one literal, the value of this literal is fixed.

$$\{X\} \in S \Rightarrow X = \top$$

Absorption. If a disjunction is a superset of another disjunction, it can be ignored.

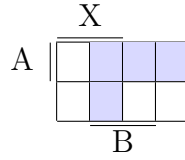$$\forall X \subseteq Y : X \cdot Y \equiv_{\text{CNF}} X$$

Proof: $(X \Rightarrow Y) \vee \neg X$ makes Y irrelevant.

The Absorption Rule allows to freely create new disjunctions, as long it's consisting of an already existing disjunction.
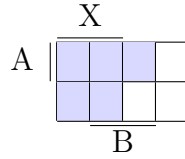
Common Contradiction.

$$(A + X) \cdot (B + \overline{X}) \equiv_{\text{CNF}} (BX + A\overline{X})$$

Common Part.

$$(A + X) \cdot (B + X) \equiv_{\text{CNF}} (X + AB)$$

Common and Contradicting Part

$$(A+B+C)\cdot(A+\neg B+D) \equiv_{\text{CNF}} (A+(B+C)(\neg B+D)) \equiv_{\text{CNF}} (A+BD+C\overline{B})$$