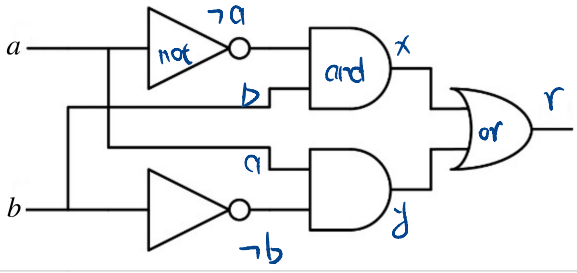
CI-tutorial-8

Exercise 1.



$(\neg a \wedge b) \vee (a \wedge \neg b)$

$x \leftrightarrow (\neg a \wedge b)$ $\quad (\neg x \vee \neg a) \wedge (\neg x \vee b) \wedge (a \vee \neg b \vee x)$

$y \leftrightarrow (a \wedge \neg b) \Rightarrow (\neg y \vee a) \wedge (\neg y \vee \neg b) \wedge (\neg a \vee b \vee y)$

$r \leftrightarrow x \vee y$ $\quad (\neg x \vee r) \wedge (\neg y \vee r) \wedge (\neg r \vee x \vee y)$

let $r = 1$:

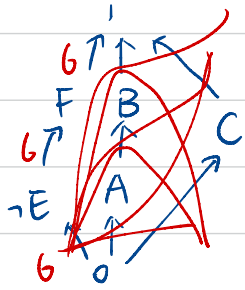
$\Rightarrow (\neg x \vee \neg a) \wedge (\neg x \vee b) \wedge (a \vee \neg b \vee x)$

$\wedge (\neg y \vee a) \wedge (\neg y \vee \neg b) \wedge (\neg a \vee b \vee y)$

$\wedge (x \vee y)$

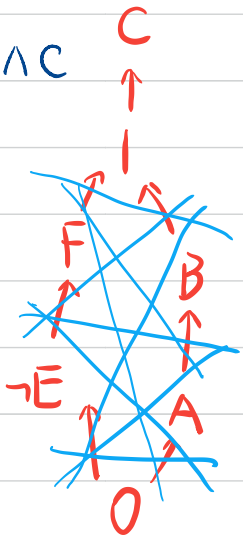
Exercise 2

$(E \vee F) \wedge (\neg A \vee B) \wedge C = (\neg E \rightarrow F) \wedge (A \rightarrow B) \wedge C$



No. of Satisfying assignments

$= 6+6+6 = 18$



No. = 9

Exercise 3

$B \times B \longrightarrow B = \neg(B \wedge B) \vee B$

$a \times b = a \wedge b$

$a \rightarrow b = \neg a \vee b.$