MI, CHF 2.ročník, MAT, ES 2022, Opravná kontrolka ...

Cv 2.1 2017 jaro

a) $x \to (y \to (x \wedge z))$ ekvivalentní s $x \to (z \to (y \to x \wedge z))$

$\bar{X} \vee (y \vee \bar{z})$

x	y	z	cv
0	0	1	1
0	1	0	1
0	1	1	1
1	0	1	1
1	1	0	0
1	1	1	0

$(\neg x \vee y \vee \bar{z}) \vee (\neg x \vee \bar{z})$

$\vee (\neg x \vee y)$

$(\neg x \vee y \vee \bar{z}) \vee (\neg x \vee \bar{z})$

$\vee (\neg x \vee y)$

b) Existuje α takové, že $\alpha \to (x \to y)$

$(x \to y) \vee (\neg x \to y)$

x	y	$\alpha \to (x \to y)$	$\alpha \to (x \to y)$	cv
0	0	1	1	1
0	1	0	0	0
0	1	1	0	0
1	0	1	1	1
1	0	0	0	0
1	1	1	1	1

$(x \wedge \bar{y} \wedge \bar{\alpha}) \vee (\alpha \wedge y \wedge x)$

Cv 2.2

$f(x,y,z) = \bigcirc\!\!\bigcirc\!\!\bigcirc$

$(x \vee y) \wedge (y \vee \bar{z})$

x	y	$x \vee y$	$y \vee \bar{z}$
0	0	0	1
0	1	1	1
1	0	1	1
1	1	1	1
0	0	0	1
0	1	1	1
1	0	1	1
1	1	1	1

b) $f(x,y,z) = \bigcirc\!\!\bigcirc\!\!\bigcirc$

$(x \vee y) \wedge (y \vee \bar{z})$

a) $f(x,y,z) = (x \vee y) \wedge (y \vee \bar{z})$

$\Downarrow$

$(x \vee y) \wedge (y \vee \bar{z}) \Leftrightarrow (y \vee \bar{z})$

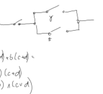
$\Downarrow$

Nadbytečná část, nikdy bude vyhodnocována

Cv 2.3

a) $x \wedge (y \to z)$

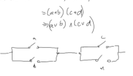
$x \wedge (\bar{y} \vee z)$



b) ve vrcholu vlevo: $a \wedge (c \to d) \wedge b \wedge (c \to d) \wedge$

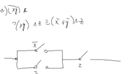
$\Rightarrow (a \wedge b) \wedge (c \to d)$

$\Rightarrow (a \wedge b) \wedge (c \to d)$



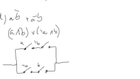
c) $\bar{(x \vee y)} \wedge z$

$\bar{f}(x,y) \wedge z = (\bar{x} \wedge \bar{y}) \wedge z$

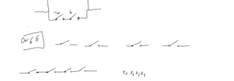


d) $x \vee \bar{x} \wedge z \vee \bar{z}$

$(x \vee \bar{x}) \wedge (x \vee z) \wedge (\bar{x} \vee \bar{z})$

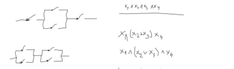


Cv 2.5



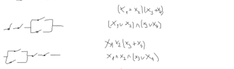
a, b, c, d

$a, b, c, d, e, d \vee e$



$x_1, (x_1 \vee x_2) \wedge x_3$

$x_1 \wedge (x_2 \vee x_3) \wedge x_4$



$(x_1 \vee x_2) \wedge (x_3 \vee x_4)$

$(x_1 \vee x_2) \wedge (x_3 \vee x_4)$

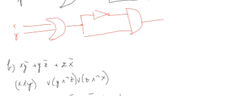
$\bar{x}_1 \vee \bar{x}_2 \vee (x_3 \vee x_4)$

$x_1 + x_2 = (x_1 \vee x_2)$

$(x_1 + x_2) \wedge x_3$

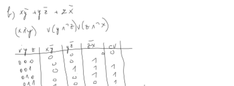
$(x_1 \vee x_2) \wedge x_3$

$(x_1 \vee x_2) \wedge (x_3 \vee x_4)$



$\bar{x}_1 \vee \bar{x}_2 \vee (x_3 \vee x_4)$

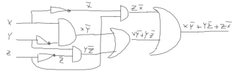
$x_1 + x_2 = (x_1 \vee x_2)$



$(x_1 + x_2) \wedge x_3$

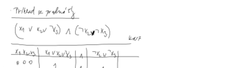
$(x_1 \vee x_2) \wedge x_3$

$(x_1 \vee x_2) \wedge (x_3 \vee x_4)$

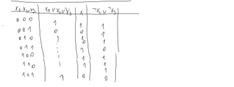


$x_1 + x_2 + x_3 + x_1$

$x_1 \vee x_2 \vee x_3 \vee x_4$



3d like



Cv 2.6 neboli

a) $\bar{(x \vee y)} \vee (x \vee y)$

$\neg(x \vee y) \wedge (x \vee y)$

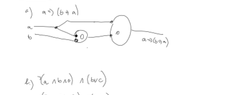
x	y	$\bar{x}$	$\bar{y}$	$\bar{x} \wedge \bar{y}$	cv
0	0	1	1	1	1
0	1	1	0	0	0
1	0	0	1	0	0
1	1	0	0	0	0

b) $\bar{y} \to \bar{y} \vee \bar{z} \to \bar{x}$

$(x \vee y) \vee (y \vee z \vee \bar{x})$

x	y	z	$\bar{x}$	$\bar{y}$	$\bar{y} \vee \bar{z}$	cv
0	0	0	1	1	1	1
0	0	1	1	1	1	1
0	1	0	1	0	1	1
0	1	1	1	0	1	1
1	0	0	0	1	1	1
1	0	1	0	1	1	1
1	1	0	0	0	0	0
1	1	1	0	0	0	0

$(x \vee y) \vee (y \vee z \vee \bar{x})$

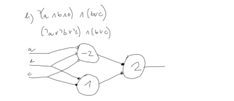


Trikład se zpětnou vazbou

$(x_1 \vee x_2 \vee \bar{x}_3) \wedge (\neg x_1 \vee x_3)$

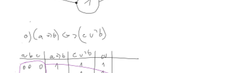
x_1	x_2	x_3	$\bar{x}_3$	$x_1 \vee x_2$	$\neg x_1 \vee x_3$	cv
0	0	0	1	0	1	0
0	0	1	0	0	1	0
0	1	0	1	1	1	1
0	1	1	0	1	1	1
1	0	0	1	1	0	0
1	0	1	0	1	1	1
1	1	0	1	1	0	0
1	1	1	0	1	1	1

$(x_1 \vee x_2 \vee \bar{x}_3) \wedge (\neg x_1 \vee x_3)$



Cv 2.9

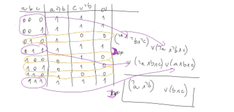
a) $a \to (b \wedge a)$



$a \to (b \wedge a)$

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

$(a \vee \bar{b} \vee \bar{c}) \wedge (b \vee c)$



c) $(a \to b) \to (c \vee \bar{b})$

a	b	c	$\bar{b}$	$a \to b$	$c \vee \bar{b}$	cv
0	0	0	1	1	1	1
0	0	1	1	1	1	1
0	1	0	0	1	0	0
0	1	1	0	1	1	1
1	0	0	1	0	1	1
1	0	1	1	0	1	1
1	1	0	0	1	0	0
1	1	1	0	1	1	1

$(a \vee \bar{b} \vee \bar{c})$

$\vee (\bar{a} \vee \bar{b} \vee \bar{c})$

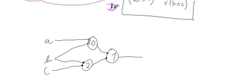
$\vee (a \vee b \vee c)$

$\vee (\bar{a} \vee b \vee c)$

$(a \vee b \vee c) \vee (a \vee b \vee \bar{c})$

$(\bar{a} \vee \bar{b} \vee \bar{c})$

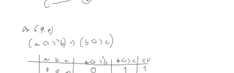
$\vee (b \vee c)$



Cv 2.9

$(a \to b) \to (b \to c)$

a	b	c	$a \to b$	$b \to c$	cv
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	1	0	0
0	1	1	1	1	1
1	0	0	0	1	1
1	0	1	0	1	1
1	1	0	1	0	0
1	1	1	1	1	1

$(a \vee \bar{b} \vee \bar{c})$

$(b \vee \bar{c})$