

$$(\bar{s} \bar{n} \bar{g}) \vee (s \bar{n} \bar{g}) \vee (s n \bar{g})$$

$$\bar{g} \wedge ((\bar{s} \bar{n}) \vee (s \bar{n}) \vee (s n))$$

$$\bar{g} \wedge (\bar{n} \wedge (\bar{s} \vee s) \vee (s n))$$

$$\bar{g} \wedge (\bar{n} \wedge 1 \vee (s n))$$

$$\bar{g} \wedge (\bar{n} \vee (s n))$$

$$\bar{g} \wedge ((\bar{n} \vee s) \wedge (\bar{n} \vee n))$$

$$\bar{g} \wedge ((\bar{n} \vee s) \wedge 1)$$

$$\bar{g} \wedge (\bar{n} \vee s)$$

Fehler aus Stunde:

$\bar{s} \bar{n}$ ist nicht die Negation von sn (Sondern $\overline{sn}$)

↳ daher Komplementgesetz nicht ngl.

inf Schule 12.2.4

Aufgabe 1

$$(\bar{k} \wedge t \wedge \bar{w}) \vee (k \wedge \bar{t} \wedge \bar{w}) \vee (k \wedge t \wedge \bar{w})$$

$$\bar{w} \wedge ((\bar{k} \wedge t) \vee (k \wedge \bar{t}) \vee (k \wedge t))$$

$$\bar{w} \wedge ((\bar{k} \wedge t) \vee (k \wedge (\bar{t} \vee t)))$$

$$\bar{w} \wedge ((\bar{k} \wedge t) \vee (k \wedge 1))$$

$$\bar{w} \wedge ((\bar{k} \wedge t) \vee k)$$

$$\bar{w} \wedge ((\bar{k} \vee k) \wedge (k \vee t))$$

$$\bar{w} \wedge (1 \wedge (k \vee t))$$

$$\bar{w} \wedge (k \vee t)$$

1. 1.

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

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

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

$$(\bar{a} \vee 0) \wedge (\bar{b} \vee 0)$$
$$\bar{a} \wedge \bar{b}$$

$$\begin{aligned}
 1.4. \quad & (a \vee \overline{b} \wedge a) \wedge (c \vee (d \vee c)) \\
 & (a \vee \overline{b} \vee \overline{a}) \wedge (c \vee d \vee c) \quad | \text{De Morgan's Asso.} \\
 & \underline{(a \vee \overline{a} \vee \overline{b})} \wedge \underline{(c \vee c \vee d)} \quad | \text{Kommut.} \\
 & (1 \vee \overline{b}) \wedge (c \vee d) \quad | \text{Kompl., idemp.} \\
 & 1 \wedge (c \vee d) \quad | \text{Extremal} \\
 & c \vee d
 \end{aligned}$$

$$\begin{aligned}
 1.5. \quad & \overline{(a \wedge b \vee \overline{c})} \wedge (\overline{a} \vee b \vee \overline{c}) \quad | \text{De Morgan} \\
 & (\overline{a} \vee \overline{b} \vee \overline{c}) \wedge (\overline{a} \vee b \vee \overline{c}) \quad | \text{Distributiv} \\
 & (\overline{a} \vee \overline{c}) \vee (\overline{b} \wedge b) \quad | \text{Komplementär} \\
 & (\overline{a} \vee \overline{c}) \vee 0 \quad | \text{Neutral.} \\
 & \overline{a} \vee \overline{c}
 \end{aligned}$$

$$\begin{aligned}
 1.6. \quad & \overline{a \wedge b \vee c \vee (a \wedge c)} \quad | \text{De Morgan} \\
 & \overline{a \wedge b \wedge \overline{c} \vee (a \wedge c)} \quad | \text{Distrib.} \\
 & \overline{a \wedge (b \wedge \overline{c} \vee c)} \quad | \text{Distr.} \\
 & \overline{a \wedge ((b \vee c) \wedge (c \vee \overline{c}))} \quad | \text{Kompl.} \\
 & \overline{a \wedge ((b \vee c) \wedge 1)} \quad | \text{Neutral.} \\
 & \overline{a \wedge (b \vee c)}
 \end{aligned}$$

Vereinfachung Karnaugh Map

am Bsp Ledestation (Inf-schule)

s	n	g	L
0	0	0	1
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	1
1	1	1	0

Disjunktive Normalf.

$$\bar{s} \wedge \bar{n} \wedge \bar{g}$$

✓

$$s \wedge \bar{n} \wedge \bar{g}$$

$$s \wedge \bar{n} \wedge g$$

ng $\bar{n}\bar{g}$ $\bar{n}g$ $n\bar{g}$

s	ng	$\bar{n}\bar{g}$	$\bar{n}g$	$n\bar{g}$
s	0	0	1	1
$\bar{s}$	0	0	1	0

$$\bar{g}s$$

$$\bar{n}$$

① Karnaugh Maps

a	b	A	B	C	D	E
0	0	0	0	0	0	1
0	1	0	0	1	1	1
1	0	0	0	1	1	1
1	1	0	1	1	0	1

A) 0

	b	$\bar{b}$
a	0	0
$\bar{a}$	0	0

B) $a\bar{b}$

	b	$\bar{b}$
a	1	0
$\bar{a}$	0	0

C) $\bar{a} \wedge b \vee a \wedge \bar{b} \vee a \wedge b$

	b	$\bar{b}$
a	1	1
$\bar{a}$	1	0

$a \vee b$

D) $\bar{a} \wedge \bar{b} \vee a \wedge \bar{b}$

	b	$\bar{b}$
a	0	1
$\bar{a}$	1	0

$\uparrow$

E) 1

1	1
1	1

Karnaugh Map für Arbeitsblatt 300

1.1

a	b	$\bar{a} \vee \bar{b}$	$\bar{a} \vee b$	$a \vee \bar{b}$	...
0	0	1	1	1	1
0	1	1	1	0	0
1	0	1	0	1	0
1	1	0	1	1	0

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

	b	$\bar{b}$	
a	0	0	$\bar{a} \wedge \bar{b}$
$\bar{a}$	0	1	

1.2

	$\bar{a}\bar{b}$	$\bar{a}b$	$a\bar{b}$	ab
$\bar{c}$	0	1	1	0
c	0	0	1	1

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

1.3

	$\bar{a}\bar{b}$	$\bar{a}b$	$a\bar{b}$	ab
$\bar{c}$	0	0	0	1
c	0	0	0	1

$$a\bar{b}$$

1.4

	$\bar{a}\bar{b}$	$\bar{a}b$	$a\bar{b}$	ab
$\bar{c}d$	0	0	0	0
$\bar{c}\bar{d}$	1	1	1	1
$c\bar{d}$	1	1	1	1
cd	1	1	1	1

$$d \vee c$$

$$\begin{aligned}
 1.7. \quad & (a \vee \underline{b}) \wedge (\underline{\bar{a}} \vee \underline{b}) \wedge (a \vee \underline{\bar{b}}) \wedge (\underline{\bar{a}} \vee \underline{\bar{b}}) \\
 & b \vee (a \wedge \bar{a}) \quad \wedge \quad \bar{b} \vee (a \wedge \bar{a}) \quad | 2 \times \text{Dist.} \\
 & b \vee 0 \quad \wedge \quad \bar{b} \vee 0 \quad | \text{Korpe} \\
 & b \wedge \bar{b} \quad | 2 \times \text{Neutr.} \\
 & 0 \quad | \text{Korpl.}
 \end{aligned}$$

$$\begin{aligned}
 1.8. \quad & a \vee (\bar{b} \wedge \overline{a \vee b \vee c}) \quad | \text{De Morgan} \\
 & a \vee (\bar{b} \wedge \bar{a} \wedge \bar{b} \wedge \bar{c}) \quad | \text{Kommutativ} \\
 & a \vee (\bar{b} \wedge \bar{b} \wedge \bar{a} \wedge \bar{c}) \quad | \text{Korpl.} \\
 & a \vee (0 \wedge \bar{a} \wedge \bar{c}) \quad | \text{Extremal} \\
 & a \vee 0 \quad | \text{Neutr.} \\
 & a
 \end{aligned}$$

$$\begin{aligned}
 1.2. \quad & (a \wedge b) \vee (a \wedge c) \vee (b \wedge \bar{c}) \\
 & c \wedge a \vee \bar{c} \wedge b \vee \underline{(c \vee \bar{c})} \wedge a \wedge b \quad | \begin{array}{l} \text{Idemp.} \\ \text{Neutr.} \end{array} \\
 & c \wedge a \vee \bar{c} \wedge b \vee c \wedge a \wedge b \vee \bar{c} \wedge a \wedge b \\
 & (c \wedge b \vee c \wedge a \wedge b) \vee (\bar{c} \wedge b \vee \bar{c} \wedge a \wedge b) \\
 & c \wedge a \wedge (1 \vee b) \vee \bar{c} \wedge b \wedge (1 \vee a) \\
 & c \wedge a \quad \vee \quad \bar{c} \wedge b
 \end{aligned}$$