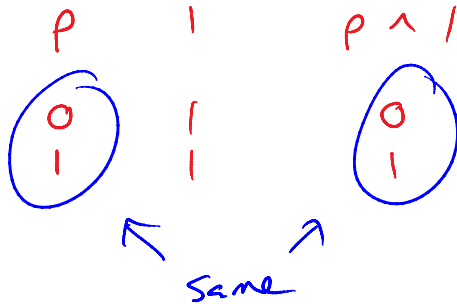


Section 1.6: cont'd

Wednesday, October 07, 2015
10:33 AM

example: use a truth table to simplify $p \wedge 1$



$$p \wedge 1 \Leftrightarrow p$$

$$p$$

write a truth table for $\overline{p \vee \bar{q}} \wedge \bar{r}$

p	q	r	\bar{q}	\bar{r}	$p \vee \bar{q}$	$\overline{p \vee \bar{q}}$	$\overline{p \vee \bar{q}} \wedge \bar{r}$
0	0	0	1	1	1	0	0
0	0	1	1	0	1	0	0
0	1	0	0	1	0	1	1
0	1	1	0	0	0	1	0
1	0	0	1	1	1	0	0
1	0	1	1	0	1	0	0
1	1	0	0	1	1	0	0
1	1	1	0	0	1	0	0

simplify: $(\bar{p} \wedge \bar{q}) \vee (p \wedge \bar{q})$

p	q	\bar{p}	\bar{q}	$\bar{p} \wedge \bar{q}$	$p \wedge \bar{q}$	$(\bar{p} \wedge \bar{q}) \vee (p \wedge \bar{q})$
0	0	1	1	1	0	1
0	1	1	0	0	0	0

0	0	1	1	1	0	1
0	1	1	0	0	0	0
1	0	0	1	0	1	1
1	1	0	0	0	0	0

\bar{q}

$$(\bar{p} \wedge \bar{q}) \vee (p \wedge q) \Leftrightarrow \bar{q}$$

Is $\overline{p \oplus q}$ logically equivalent to $\bar{p} \oplus \bar{q}$?

p	q	\bar{p}	\bar{q}	$p \oplus q$	$\overline{p \oplus q}$	$\bar{p} \oplus \bar{q}$
0	0	1	1	0	1	0
0	1	1	0	1	0	1
1	0	0	1	1	0	1
1	1	0	0	0	1	0

NO

$\overline{p \oplus q} \not\Leftrightarrow \bar{p} \oplus \bar{q}$