

Section 1.9: contd

Tuesday, October 07, 2014
8:33 AM

example: simplify using the LOL

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

$$\bar{p} \wedge (\bar{q} \vee q) \wedge 1 \quad \text{identity}$$

$$\bar{p} \wedge 1 \wedge 1 \quad \text{complement}$$

$$(\bar{p} \wedge 1) \wedge 1 \quad \text{associate (can skip this step)}$$

$$\bar{p} \wedge 1 \quad \text{identity}$$

$$\bar{p} \quad \text{"}$$

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

$$0 \vee 1 \quad \text{complement}$$

any of $\left\{ \begin{array}{l} \text{identity} \\ \text{complement} \\ \text{definition of "or"} \end{array} \right.$

simplify: (brainteaser)

$$\overline{p \vee (q \wedge \bar{r})} \wedge (p \vee (q \wedge \bar{r}))$$

$$0 \quad \text{complement}$$

0

complement

Simplify:

$$(A + A)(\bar{B}B) + (B+B)(A+\bar{A})$$

$$A(\bar{B}B) + B(A+\bar{A}) \quad \text{idempotent}$$

$$A \cdot 0 + B \cdot 1 \quad \text{complement}$$

$$0 + B \quad \text{identity}$$

$$B$$

"

Summary:

identity laws : deal with zeros & ones

idempotent : deal with a variable and itself

complement : deal with a variable and its negation

commutative }
associative } don't have to write these
all