

Homework

① $x(x' + y) = ?$

$$\begin{aligned} x(x' + y) &= x \cdot x' + x \cdot y \\ &= 0 + xy \\ &= xy \end{aligned}$$

③ $(x + y) \cdot (x + y') = ?$

$$\begin{aligned} \text{dual } \hookrightarrow &= xy + xy' \\ &= x(y + y') \\ &= x \cdot 1 \\ &= x \end{aligned}$$

② $x + x'y = a$

$$\text{dual}(x + x'y) = \text{dual}(a)$$

$$\begin{aligned} x \cdot (x' + y) &= \text{dual}(a) \\ = x \cdot x' + xy &= \text{dual}(a) \\ = 0 + xy &= \text{dual}(a) \\ xy &= \text{dual}(a) \\ x + y &= a \end{aligned}$$

④ $xy + x'z + yz = ?$

$$xy + x'z + yz$$

\nwarrow Redundant

we apply the consensus theorem

$$\begin{aligned} xy + x'z + yz \cdot (x + x') \\ = xy + x'z + yzx + yzx' \\ = xy(1 + z) + x'z(1 + y) \\ = xy + x'z \end{aligned}$$

⑤ $(x + y) \cdot (x' + z) \cdot (y + z) = a$

$$\begin{aligned} \text{dual}((x + y) \cdot (x' + z) \cdot (y + z)) &= \text{dual}(a) \\ xy + x'z + yz &= \text{dual}(a) \end{aligned}$$

\nwarrow Redundant

we apply the consensus theorem

$$\begin{aligned} &= xy + x'z + yz \cdot (x + x') \\ &= xy + x'z + yzx + yzx' \\ &= xy(1 + z) + x'z(1 + y) = xy + x'z \end{aligned}$$

$$xy + x'z = \text{dual}(a)$$

$$(x + y) \cdot (x' + z) = a //$$