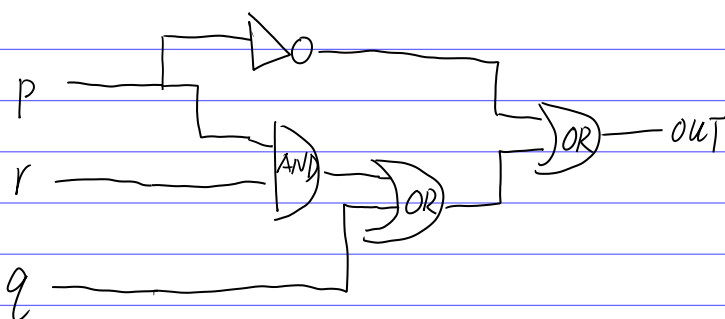


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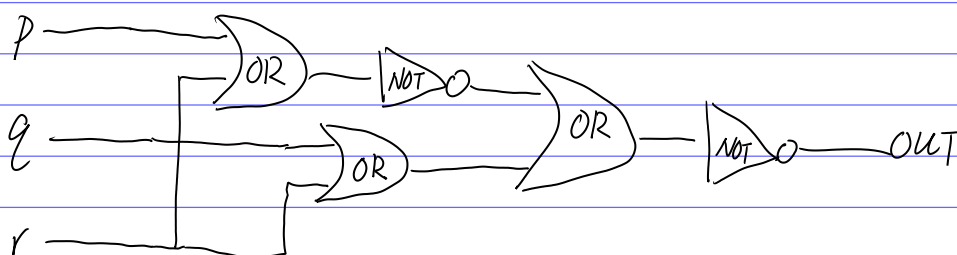
$$(a) \quad p \rightarrow (\neg q \rightarrow (p \wedge r))$$

$$\equiv \neg p \vee (q \vee (p \wedge r))$$

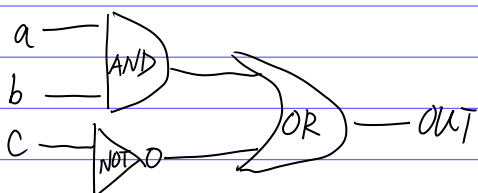


$$(b) \quad \neg((p \vee r) \rightarrow (q \vee r))$$

$$\equiv \neg(\neg(p \vee r) \vee (q \vee r))$$



4.



$$x_1 \wedge x_2$$

$$\equiv \neg(\neg x_1 \vee \neg x_2)$$

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

$$\equiv (\neg x_1) \downarrow (\neg x_2)$$

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

$$\equiv (x_1 \downarrow x_1) \downarrow (x_2 \downarrow x_2)$$

$$\equiv \neg(((a \downarrow a) \downarrow (b \downarrow b)) \downarrow (c \downarrow c))$$

$$\equiv ((a \downarrow a) \downarrow (b \downarrow b)) \downarrow (c \downarrow c)$$

$$\downarrow ((a \downarrow a) \downarrow (b \downarrow b)) \downarrow (c \downarrow c)$$

