

SOME LOGIC FORMULA

Let P, Q, R be statement forms.

associativity:

$$\begin{aligned} P \vee (Q \vee R) &= (P \vee Q) \vee R \\ P \wedge (Q \wedge R) &= (P \wedge Q) \wedge R \end{aligned}$$

commutativity:

$$\begin{aligned} P \vee Q &= Q \vee P \\ P \wedge Q &= Q \wedge P \end{aligned}$$

distributivity

$$\begin{aligned} P \vee (Q \wedge R) &= (P \vee Q) \wedge (P \vee R) \\ P \wedge (Q \vee R) &= (P \wedge Q) \vee (P \wedge R) \end{aligned}$$

De Morgan's law

$$\begin{aligned} \neg(P \vee Q) &= \neg P \wedge \neg Q \\ \neg(P \wedge Q) &= \neg P \vee \neg Q \end{aligned}$$

negation

$$\neg(\neg P) = P$$

negation of implication

$$\neg(P \Rightarrow Q) = P \wedge (\neg Q)$$