SOME LOGIC FORMULA

Let P, Q, R be statement forms.

associativity:
$$P \vee (Q \vee R) = (P \vee Q) \vee R$$
$$P \wedge (Q \wedge R) = (P \wedge Q) \wedge R$$

commutativity:
$$P \vee Q = Q \vee P$$
$$P \wedge Q = Q \wedge P$$

distributivity
$$P \vee (Q \wedge R) = (P \vee Q) \wedge (P \vee R)$$
$$P \wedge (Q \vee R) = (P \wedge Q) \vee (P \wedge R)$$

De Morgan's law
$$\neg(P \vee Q) = \neg P \wedge \neg Q$$
$$\neg(P \wedge Q) = \neg P \vee \neg Q$$

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

negation of implication
$$\neg(P \Rightarrow Q) = P \wedge (\neg Q)$$