Homework 1

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Problem 1:

(a) $((p \wedge q) \vee p) \wedge q$

$$((p \wedge q) \vee p) \wedge q$$
$$((p \vee p) \wedge (q \vee p)) \vee p$$
$$(\cancel{(p \vee p)} \wedge (q \vee p)) \vee p$$
$$q \wedge q \vee p \wedge q$$
$$\cancel{q \wedge q} \vee p \wedge q$$
$$p \wedge q$$

Not a tautology because $p \wedge q$ can be false.

(b) $p \rightarrow (p \vee q)$