Tutorial 5 (Logic and Proof Theory)

Use a Truth Table to verify the following statements

1. $\neg(p \wedge q) \equiv \neg p \vee \neg q$
2. Determine whether $(p \rightarrow q) \wedge (q \rightarrow r) \rightarrow (p \rightarrow r)$ is a tautology
3. Determine whether $((\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$ is a tautology
4. Show that $(p \rightarrow r \wedge (q \rightarrow r))$ and $((p \vee q) \rightarrow r$ are logically equivalent

Then test each result using the laws of logic.