

1.3 Propositional Equivalences

1.3 pg. 34 # 7

Use De Morgan's laws to find the negation of each of the following statements.

- a) Jan is rich and happy.
- b) Mei walks or takes the bus to class.

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Show that each conditional statement is a tautology without using truth tables

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

d $(p \wedge q) \rightarrow (p \rightarrow q)$

f $\neg(p \rightarrow q) \rightarrow \neg q$

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Determine whether $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$ is a tautology.

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Show that $\neg(p \leftrightarrow q)$ and $p \leftrightarrow \neg q$ are logically equivalent.