

Midterm coursework assignment - Fundamentals of computer science:

1. Construct a truth table for $((p \rightarrow q) \vee (p \rightarrow r)) \leftrightarrow (\neg p \vee q \vee r)$. Is this a tautology or contradiction?

p	q	$(p \rightarrow q)$	r	$(p \rightarrow r)$	$(p \rightarrow q) \vee (p \rightarrow r)$	$\neg p$	$\neg p \vee q$	$\neg p \vee q \vee r$	$((p \rightarrow q) \vee (p \rightarrow r)) \leftrightarrow (\neg p \vee q \vee r)$
1	1	0	1	0	0	0	1	1	0
1	0	0	0	0	0	0	0	0	1
0	1	1	1	1	1	1	1	1	1
0	0	1	0	1	1	1	1	1	1

This is a contradiction, as the value for $((p \rightarrow q) \vee (p \rightarrow r)) \leftrightarrow (\neg p \vee q \vee r)$ is not always true (1) and thus it cannot be a tautology.