Answer on Question #85653 – Math – Discrete Mathematics

Question

Prove that the conditional proposition and its contrapositive are logically equivalent suing the truth table.

Proof

the conditional proposition is $p \to q$, and its contrapositive is $(\neg q \to \neg p)$
Truth table:

p	q	$p \to q$	$\neg q \to \neg p$
T	T	T	T
T	F	F	F
F	T	T	T
F	T	T	T

Each row of $(\neg q \to \neg p)$ is identical to the corresponding row of $p \to q$. Therefore, conditional proposition is logically equivalent to its contrapositive.