Logical Equivalences

Example 1

Show that $\neg p \rightarrow (q \rightarrow r) \equiv q \rightarrow (p \vee r)$ using logical equivalences.

- $\neg p \rightarrow (q \rightarrow r) \equiv \neg p \rightarrow (\neg q \vee r)$:

Conditional as a disjunction

- $\neg p \rightarrow (\neg q \vee r) \equiv p \vee (\neg q \vee r)$:

Conditional as a disjunction

- $p \vee (\neg q \vee r) \equiv (p \vee \neg q) \vee r$

Associative laws

- $(p \vee \neg q) \vee r \equiv (\neg q \vee p) \vee r$

Commutative laws

- $(\neg q \vee p) \vee r \equiv \neg q \vee (p \vee r)$

Associative law

- $\neg q \vee (p \vee r) \equiv q \rightarrow (p \vee r)$

Disjunction as a conditional