MATH 11: Introduction to Discrete Structures

Midterm Review

Problem 1. Let p represent the statement "I have coffee" and q represent the statement "I am awake".

Translate the symbolic expressions into plain English.

(a) $\neg p$

(b) $p \wedge q$

(c) $p \vee q$

(d) $q \vee (\neg p)$

Translate the following plain English statements into symbolic language using the symbols p, q, $\wedge$, $\vee$, and $\neg$.

(a) "I have coffee."

(b) "I have coffee and I am awake."

(c) "Either I have coffee or I am awake."

(d) "I am not awake or I do not have coffee."

Problem 2. Construct the truth tables for the following compound statements.

(a) $\neg(p \vee q)$.

(b) $\neg(p \vee q) \wedge r$.

(c) $p \vee (q \wedge \neg r)$.

Problem 3. Use truth tables to show that the propositions $\neg(p \wedge \neg q)$ and $\neg p \vee q$ are logically equivalent.