

M260 1.1

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Logical Form and Logical Equivalence

New terms in mathematics are defined using _____.

How are Initial terms defined? _____.

Undefined terms in logic are: _____, _____, and _____.

A statement or proposition is a sentence that is _____

but not _____.

$\sim p$ is called the _____ of p .

$p \wedge q$ is called the _____ of p and q .

$p \vee q$ is called the _____ of p and q .

Truth tables for negation, conjunction, and disjunction:

p	$\sim p$

p	q	$p \wedge q$

p	q	$p \vee q$

A Statement form is an expression made up of _____ and

_____. A truth table can be used with a statement form to

show truth values that correspond to different combinations of the truth values for the

variables.

Truth table for “exclusive or”:

Two statement forms are logically equivalent if _____
 _____.

Truth table showing $\sim(p \vee q) \equiv \sim p \wedge \sim q$

For statement variables p, q, r, tautology t, and contradiction c, find logical equivalents of the following:

$p \wedge q \equiv$ _____

$p \vee q \equiv$ _____

$(p \wedge q) \wedge r \equiv$ _____

$(p \vee q) \vee r \equiv$ _____

$p \wedge (q \vee r) \equiv$ _____

$p \vee (q \wedge r) \equiv$ _____

$p \wedge t \equiv$ _____

$p \vee c \equiv$ _____

$p \vee \sim p \equiv$ _____

$p \wedge \sim p \equiv$ _____

$\sim(\sim p) \equiv$ _____

$p \wedge p \equiv$ _____

$p \vee p \equiv$ _____

$\sim(p \wedge q) \equiv$ _____

$\sim(p \vee q) \equiv$ _____

$p \vee t \equiv$ _____

$p \wedge c \equiv$ _____

$p \vee (p \wedge q) \equiv$ _____

$p \wedge (p \vee q) \equiv$ _____

$\sim t \equiv$ _____

$\sim c \equiv$ _____