Math 156 X01
Assignment 2

Covers: Sections 2.3-2.8
Due: Thurs Feb 5 at 8:30am

INSTRUCTIONS:
This assignment will be marked for completion.
Solutions will be posted on the course website 24 hours after the deadline.
You may not copy the work of another person or AI.
Submit jpg or pdf files to the D2L Dropbox.

1. Use a truth table to simplify $(p \vee (p \oplus q)) \wedge q$.

2. Use a truth table to decide if $\sim p \wedge (p \vee q)$ is logically equivalent to $\sim p \wedge q$.

3. Draw the gate representation for $A\overline{B} + C$.

4. State the name of the law that is being used:

a) $r \wedge (\sim p \vee q) \Leftrightarrow (r \wedge \sim p) \vee (r \wedge q)$

b) $AB(\overline{AB} + C) = ABC$

c) $\overline{\overline{C}D} = \overline{\overline{C}} + \overline{D}$

5. Use the Laws of Logic to show that $\sim ((p \vee \sim q) \wedge \sim p)$ is logically equivalent to $p \vee q$. Use one law per line, and state the name of the law on each line.

6. Consider the statement:
"If $x$ equals 3 then $y$ does not equal 7."
Write the indicated statement, and state if it is logically equivalent to the original statement or not.
a) the inverse
b) the converse
c) the contrapositive

7. The following statement is true:
Swizzles sob if and only if lants don't laugh.
Answer YES, NO or MAYBE.

a) Lants laugh. Do swizzles sob?
b) Swizzles don't sob. Do lants laugh?
c) Lants don't laugh. Do swizzles sob?
d) Swizzles sob. Do lants laugh?