

Homework 2 – MATH 2510 Spring 2019

1. Determine whether the statement is a tautology, a contradiction, or neither by constructing a truth table.
 - a. $(\neg P \vee Q) \vee (P \wedge Q)$
 - b. $(\neg P \vee \neg Q) \vee (P \wedge Q)$
 - c. $P \rightarrow (P \vee Q)$
 - d. $Q \leftrightarrow (P \wedge Q)$
2. Determine whether the two statements are propositionally equivalent or not by constructing a truth table.
 - a. P and $P \rightarrow P$
 - b. $P \rightarrow Q$ and $\neg P \rightarrow \neg Q$
 - c. P and $P \vee \neg P$
3. Determine whether or not the second statement is a propositional consequence of the first statement by constructing a truth table.
 - a. $P \wedge (P \rightarrow Q)$ and Q
 - b. $\neg P \wedge (P \rightarrow Q)$ and P
4. Show that D is a propositional consequence of $(D \vee O) \wedge \neg O$.
5. Show that $\neg C$ is a propositional consequence of $(C \rightarrow \neg D) \wedge D$.