

Please complete this worksheet by **September 15th, 2021** by **11:59pm**. You do not need to upload anything to Canvas, but must mark that you completed (at least attempted) the following problems.

Once you upload a picture of your work ([here](#)), the solutions will become available so you can study for the weekly quizlet, which may draw one problem from this week's worksheets.

Problem 1

Determine whether the following are propositions, predicates, or neither:

- (a) I have a dog.
- (b) Run!
- (c) The next sentence – see part (d) – is true.
- (d) The previous sentence – see part (c) – is false.
- (e) x is a multiple of 3.

Problem 2

Use a truth table to prove the following:

- (a) $p \implies q \equiv \neg q \implies \neg p$
- (b) $\neg(p \wedge q) \equiv \neg p \vee \neg q$
- (c) $\neg(p \vee q) \equiv \neg p \wedge \neg q$
- (d) $p \wedge (q \vee r) \equiv (p \wedge q) \vee (p \wedge r)$